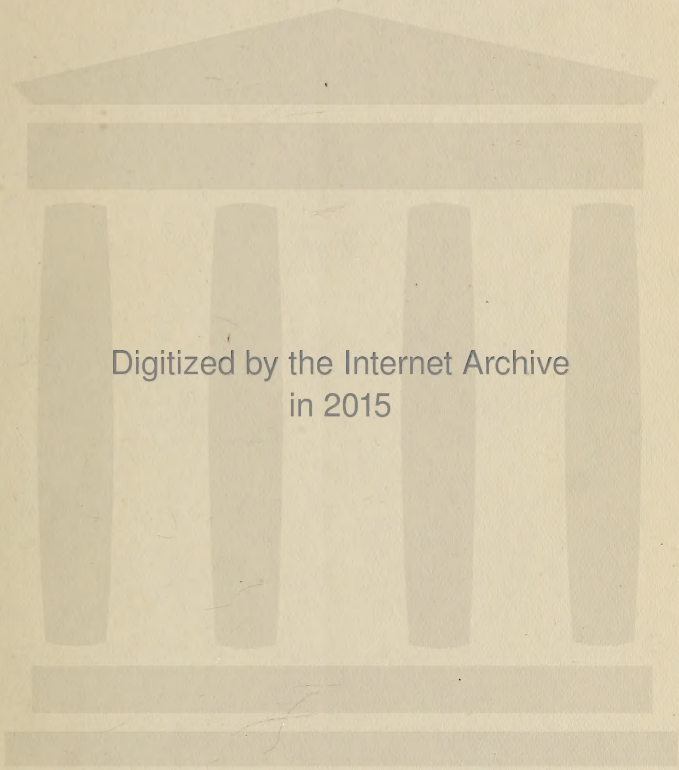


HISTORY OF THE MINISTRY OF MUNITIONS

VOLUME I

INDUSTRIAL MOBILISATION, 1914–1915

PART I

MUNITIONS SUPPLY

1922

VOLUME I

INDUSTRIAL MOBILISATION, 1914–1915

PART I

MUNITIONS SUPPLY

CONTENTS.

CHAPTER I.

Demand.

CHAPTER II.

The Machinery of Supply.

(6010) Wt. 33785/X4049 250 8/22 Harrow G.36

CHAPTER II.—*contd.*

CHAPTER III.

Some Early War Contracts.

CHAPTER III.—*contd.*

CHAPTER IV.

Supply Policy and Administration—August to December, 1914.

CHAPTER V.

The Need for Reinforcement of the Supply Organisation.

APPENDICES.

CHAPTER I.

DEMAND.

A narrative intended to review the administration of munitions supply during the first year of the war demands some comprehension of the character of the problem which the War Office was called upon to solve. It is necessary to realise clearly the nature and the limits of the preparatory measures which had been taken, and the complete collapse of the whole doctrine upon which these preparations were based. It is no less necessary to remember how obscure was the outlook; how scanty were the data upon which to establish a new war programme. It is, therefore, proposed in this chapter to consider what was involved in the formulation of a munitions programme and the steps by which that essential pre-requisite for a supply policy was in fact evolved.

I. The Size of the Army.

(*a*) The Six Division Standard.

The task which confronted the War Office in the autumn of 1914, appears in the light of later experience no less formidable than when it was first envisaged under the stimulus of an overwhelming national emergency. Whatever may be the ultimate verdict upon the achievements of this period, the unexampled gravity and difficulty of the problems presented will not be questioned.

In speaking of the extent of the country's unpreparedness for participating in a European conflict on equal terms with other great Powers, it is not necessary to qualify the language employed, nor is it any reflection upon the old Army to emphasise its insignificant proportion relatively to the task in hand. "There is no Army," said Lord Kitchener. He might have put it more strongly. There was not only no Army on the Continental scale, but there was no provision for creating one.

This unpreparedness has two fundamental aspects, the one common to the experience of all combatants, the other attributable to the peculiar circumstances of Britain as an Island State and her traditional policy as determined thereby. The former of these has regard to the unanticipated character assumed by the conflict, the unprecedented scale upon which supplies were required and the progressive standard of equipment demanded. Neither foe nor ally had foreseen these developments though the initial standard set by the enemy outclassed our own.

> "No previous experience," writes Lord French, "no conclusion I had been able to draw from campaigns in which I had taken part, or from a close study of the new conditions in which

the war of to-day is waged, had led me to anticipate a war of positions. All my thoughts, all my prospective plans, all my possible alternatives of action, were concentrated upon a war of movement and manœuvre. . . . Judged by the course of events in the first three weeks of the war neither French nor German generals were prepared for the complete transformation of all military ideas which the development of operations inevitably demonstrated to be imperative for waging war in present conditions."[1]

The second characteristic of British unpreparedness is its deliberateness. Britain in 1914 was a naval power whose Army was intended for outpost duty. The strength of the land forces of the Empire was the faithful reflection of the national choice. The result of this policy was to limit the effective preparation permitted to the War Office to the equipment of a small Expeditionary Force. In Lord Kitchener's words :—

"The pre-war theory worked out by the General Staff on instructions from the Government of the day had been that, in certain eventualities, we should despatch overseas an Expeditionary Force of six divisions in all, or in round numbers, 150,000 men ; that the Territorial Force should take over the defence of these Islands ; and that the Special Reserve should feed the Expeditionary Force. On this basis, the business of the War Office, in the event of war, was to keep the Army in the field up to strength and to perfect the arrangements for Home Defence."[2]

Within the narrow limits imposed by this policy everything possible had been achieved. The prescribed supplies, exiguous and almost negligible as they appear in relation to the vast torrent which was presently to pour across the Channel, were faithfully provided and duly forthcoming to the last detail of equipment. It was this meagre provision which carried the Army through the famous days of the retreat from Mons ; and formed the nucleus of that rapidly growing armament which yet failed for weary months in succession to overtake the insatiable demand of the forces in the field.

Long before the retreat came to an end in the victory of the Marne, indeed, before the first six divisions had been despatched to France, the whole of the pre-war plan had been superseded. To the crisis that had to be met these arrangements were so grotesquely inadequate as to be merely inapplicable. The war formula had to be restated in unfamiliar and indeed as yet indefinable terms ; for the war was to be fought out between nations, and not between armies merely.

(*b*) ENLISTMENT FOR THE NEW ARMIES.

The strength of the Forces on mobilisation barely reached a total of 700,000 men, and this number included 250,000 men enrolled in the

---

[1] *1914*, by Field-Marshal Viscount French of Ypres. Chapter I.

[2] Address to Members of Parliament, 2 June, 1916 ; *Life of Lord Kitchener*, Vol. III, p. 328.

Territorial Forces reserved for home defence, as well as about 100,000 men in India and other foreign stations.[1]

Thus, the first and the greatest task which confronted the Secretary of State for War was not that of filling the ranks of a skeleton force, not that of beating up an output of supplies according to a pre-arranged plan, but the work of creating an army and creating the machinery for supplying it at the very time when the urgent daily necessity of the Expeditionary Force was making demands of unforeseen dimensions on the pre-organised apparatus and arrangements for supply.

Lord Kitchener knew that miracles do not happen, but from the first moment his length of vision enabled him to lay his plans for the future and to foretell that even though her full weight could not be brought to bear upon the enemy, Britain's turn would come in time. Her rôle would be to grow stronger in the later stages of the struggle when the strength of combatants better prepared than she at the outset, would be waning.

Men were the first necessity ; and promptly after the declaration of war, there was issued the famous call for 100,000 recruits based upon the vote by the House of Commons of provision for 500,000 additional men on 6 August, 1914.[2] The terms of the appeal are historic, and in no respect more momentous than as the first revelation conveyed to the public by the " Terms of Service " announcement that the authorities contemplated at least the possibility of a long war.

YOUR KING AND COUNTRY NEED YOU.

A Call to Arms.

An addition of 100,000 men to His Majesty's Regular Army is immediately necessary in the present grave National Emergency. Lord Kitchener is confident that this appeal will be at once responded to by all who have the safety of our Empire at heart.

Terms of Service.

General Service for a period of 3 years or until the war is concluded.

Age of Enlistment, between 19 and 30.

How to Join.

Full information can be obtained at any Post Office in the Kingdom, or at any Military Depot.

GOD SAVE THE KING.[3]

Very shortly afterwards, on 25 August, Lord Kitchener was able to report that " the 100,000 recruits for which, in the first place, it has been thought necessary to call, have been already practically secured."

---

[1] The approximate total number of men mobilised at the outbreak of war, was :—

Regulars	234,000	
Regular Reserve	145,000	
Special Reserve	56,000	
		435,000
Territorial Forces		256,000
		691,000

[2] *Parliamentary Debates* (1914), *H. of C.*, LXV, 2080.

[3] *The Times*, 7 August, 1914.

At the same time he foreshadowed a great extension in the demands that it would be necessary to make upon the manhood of the country.

> "I cannot at this stage say what will be the limits of the forces required, or what measures may eventually become necessary to supply and maintain them. The scale of the Field Army which we are now calling into being is large, and may rise in the course of the next six or seven months to a total of thirty divisions continually maintained in the Field. But if the war should be protracted, and if its fortunes should be varied or adverse, exertions and sacrifices beyond any which have been demanded will be required from the whole Nation and Empire, and where they are required we are sure they will not be denied to the extreme needs of the state by Parliament or the people."[1]

The actual response to these early appeals was so great that the limit of the numbers voted was soon in sight, and on 10 September, 1914, a second vote for 500,000 men was taken.[2]

A week later, on 17 September, the Secretary of State made the further significant announcement that "in response to the call for recruits for the new armies which it is considered necessary to raise we have had a most remarkable demonstration of the energy and patriotism of the young men of this country. We propose to organise this material into four new armies."[3] "But," he continued, "our chief difficulty is one of *matériel* rather than *personnel*,"[4] though strenuous endeavours were being made to cope with the unprecedented situation. This warning was prophetic of the troubles that were to follow, and showed that Lord Kitchener did not underestimate the difficulty.

By the end of September 1914, enlistment had reached a total of more than three quarters of a million men, and had thus doubled the numerical strength of the Regular Army at home, as it existed three months earlier. This first rush was moderated during succeeding weeks and it was nearly six months before a further total equal to that for August and September was reached. Still the numbers went on mounting in response to the now intensified recruiting campaign. On 16 November, the House of Commons voted another million men,[5] and on 10 February, 1915, the maintainance of land forces to the aggregate number of 3,000,000 men was authorised.[6] The million mark was in fact passed by the end of November 1914; by the end of July 1915, when the war had run a full year the total of 2,000,000 recruits had been reached.[7]

---

[1] *Parliamentary Debates* (1914), *H. of L.*, XVII, 504.
[2] *Parliamentary Debates* (1914), *H. of C.*, LXVI, 663.
[3] *Parliamentary Debates* (1914) *H. of L.*, XVII, 736.
[4] *Ibid*, 738.
[5] *Parliamentary Debates* (1914) *H. of C.*, LXVIII, 305.
[6] *Ibid*, LXIX, 601.
[7] *Enlistment during the First Year of the War.* (HIST. REC./R/322/12.)

1914:	August and September	761,824	
	October–December	424,533	
1915:	January–March	358,093	2,008,892
	April–June	369,029	
	July	95,413	

(c) The Scale of National Effort.

The work of extending the framework of the Regular Army by constituting what were known as the New Armies began on 21 August, 1914.[1] Each army was to consist of six divisions. Some of these armies were formed later by a grouping of the existing Territorial Divisions, these having been reduplicated so as to form reserve divisions; in this way the original 14 Field Divisions of the Territorial Force were extended to a total of 26. Other armies were built up from the new "Kitchener" divisions. Lord Kitchener's announcement on 25 August that the War Office was aiming at "a total of thirty divisions continually maintained in the Field" meant, as he said on 17 September, four new armies in addition to the original Regular Army. It would represent a field army of about 650,000 men.[2] The thirty division standard was thus definitely adopted as the aim of the War Office at the beginning of the war, and may be taken as the minimum programme of army strength which the War Office then hoped to achieve in 1915. This, however, was but a minimum, and, in view of the steady tendency towards enlargement of programme the basis of maximum requirements for the 1915 campaign, as envisaged in the autumn of 1914, may be put at 1,100,000 men,[3] or fifty divisions.

Even this figure, however, could not be taken as the final measure of requirements so far as equipment was concerned. Early in December, 1914, instructions were given that the measures necessary for the arming of a further 1,000,000 men should be taken in hand. But even an army of 2,000,000 enrolled men was not necessarily the limit of national effort. Mr. Lloyd George, at all events, held that three and a half millions was a practicable ambition. "I believe," he wrote in February, 1915, "we could, with a special effort, raise our 3,500,000 or, if that be found inconsistent with the turning out of the necessary equipment, we could certainly raise 3,000,000."[4] This figure went beyond the maximum which Lord Kitchener had contemplated,[5] and in view of the shortage of rifles and the length of time required for training, the proposal was not one which could be immediately adopted. The immediate task was to realise and make effective the 50 division standard. Efforts to this end continued throughout the spring and early summer of 1915, and it was not until the month of July that any further advance was definitely envisaged. Sir John French when formulating his demands for future supplies to the War Office on 25 June and 8 July, 1915, based his calculations upon a gradual increase in the forces under his command. The existing 22 divisions would, according to this plan, only reach the desired total of 50 divisions in France by March or April, 1916. In communicating[6] the first of these

---

[1] Note by Secretary of State for War, 31 May, 1915 (Hist. Rec./R/1000/120).

[2] Ultimately there were five armies formed of "Kitchener" divisions; the sixth, seventh and eighth New Armies on the other hand were Territorial.

[3] Hist. Rec./R/1000/120.

[4] Some further considerations on the conduct of the war. 25 February, 1915. (Hist. Rec./R/170/22.)

[5] *Ibid.*

[6] 30 June, 1915 (D.M.R.S.30).

letters to the newly formed Ministry of Munitions for their action, the War Office increased the total demand to the figure required for the prospective equipment of 70 divisions. This higher standard was thus formally prescribed. Shortly afterwards it was tentatively announced by Lord Kitchener at the important Allied Conference held at Calais on 7 July, 1915, where the British and French Prime Ministers, attended by their principal advisers, reviewed the military position and prospects of the campaign as a whole. In the month of August the extent of the possible military effort came again under review before a strong Committee of the Cabinet where the desirability of adopting a standard of 100 divisions was powerfully advocated. This new standard did in fact become the measure of the efforts made by the Ministry of Munitions during the latter part of this year, and was accepted by Lord Kitchener as his ideal. He did not expect to see this total attained, but held that if it were possible it should be reached. Then he would say "England had done her duty and had no call to do any more."[1]

When the army actually attained its maximum strength two years later the number of its divisions still fell short of this total.

(*d*) Despatch of New Formations.

During the period now under review the strength of the forces in the field was steadily expanding. The original four divisions of the Expeditionary Force which took the field at the very outset, were reinforced by the fifth in time for the battle of le Cateau and by the sixth after the battle of the Marne. Including the cavalry this force may be reckoned as 150,000 men. After the battle of Ypres when the winter of trench warfare began, the total was about 225,000 or some 12 divisions; by the end of February it was 407,000 and at the end of May the total of 600,000 had been reached. Thus, when the Ministry of Munitions was established, the strength of the British Forces in France under Sir John French consisted of 22 infantry divisions (Regulars, 12; Territorials, 6; "K" divisions, 3; Canadians, 1); and 5 Cavalry divisions, with a total strength of approximately 600,000 men.[2]

The garrison of Egypt between December and March consisted of the equivalent of 4 divisions; one half being made up of Territorials (E. Lancs.) and troops from India and the other of contingents from Australia and New Zealand. The 29th Division was sent from England in March to take part in the land operations in the Dardanelles. The 2nd Territorial Mounted Division arrived in April, and another Territorial division (the Lowland) was sent out at the end of May, raising the total Dardanelles force to 125,000 men. The fighting forces in these two theatres of war thus amounted in all to 725,000 men. At the same time the total number of troops in England either preparing to go abroad, set aside for the supply of reinforcements, or doing garrison duty, numbered 1,500,000 men.

By the beginning of September, 1915, the strength of the army overseas had been raised to thirty-eight infantry divisions (say 800,000

---

[1] Hist. Rec./H/1000/3. [2] Hist. Rec./R/1000/120.

men), thirty of which were in France. The whole Army at this time was being organised on a 70 division basis, its units being distributed[1] as follows :—

	Home.	*France.*	*Dardanelles.*	*India.*	*Total.*
Regulars	—	13	1	—	14*
Territorial Force ..	13	6	4	3	26
" K " Divisions ..	16	11	3	—	30
					70†

* Including the recently formed " Guards " Division.

† This total does not include the two Canadian, the two Australian divisions nor the Royal Naval Division.

The second half of the year 1915 is the period during which the great majority of the new Kitchener Divisions were able to take the field, the number of divisions in France being approximately doubled during this time.

By the end of the year the overseas army had actually attained a standard of approximately 50 divisions, or, in round numbers, 1,000,000 men.

II. The Calculation of Future Requirements.

(*a*) Pre-suppositions of a Programme.

The numbers we have so far been considering give, of course, the primary measure for gauging the volume of requisite supplies. But the achievements of the supply administration must be tested not so much by the sufficiency of the supplies actually forthcoming in relation to the momentary demand of the forces in the field, but rather by the degree of success attained in fulfilling the programme of requirements laid down from time to time in anticipation of future needs, such requirements being the official starting point of all programmes of supply. The necessity for this distinction arises from the inevitable instability of actual demand. Sudden extensions of demand can only be satisfied from reserves, that is from the proceeds of earlier demands ; and the possibility of procuring bulk output at short notice can in the nature of the case only be satisfied in very exceptional circumstances. Indeed, the average interval which must elapse between the formulation of demand and its satisfaction must be taken in the light of war experience as nearer six than three months. As the art of programme making was perfected during the latter years of the war the tendency to extend the period was pronounced. In general this elaboration took the form of following back the course of production from the finished article to its components and from these to their raw materials, with subsidiary programmes concerned with the provision of equipment (machine tools, etc.), transportation, and the like.

[1] Hist. Rec./R/1000/121.

The length of the productive process is revealed to the supply administration primarily by the contractors' undertakings or contract delivery rates. Estimates of future output could, however not be based upon such promises with complete dependence on punctual performance. The degree of unpunctuality thus becomes the second important factor in programme making. In the first year of the war there was not only no accumulated experience to guide estimates as to attainable rates of delivery, but two further conditions were superimposed; as the campaign developed the projected maximum scale of effort was itself rapidly enlarged, so that the maxima of one month became the minima of the next, while the unforeseen increase in the rate of consumption, especially in the case of gun ammunition, tended to widen the breach between output and immediate requirements.

It was not possible therefore in the circumstances of the autumn of 1914 for the Army Council to lay down a programme of supply or define the requirements for the Expeditionary Force during the campaign of the following year, with the careful elaboration and reliability of forecast that was achieved when the munitions movement reached its zenith. Much painful experience was required before even approximate bases for calculation were available, and during the period we are now considering kaleidoscopic changes followed one another with a rapidity which falsified the whole basis of the programme. Even now, were it desirable, it would be impossible to construct a single programme that would correspond to the task undertaken. A programme to meet the needs of the Army as known in August would be unrecognisable in October. The October programme in turn would need formulation in December. The nature of the problem must be clearly appreciated. It was the solution of an equation in which the Army's demand for each type of munitions for a stated period from six months to a year later could be measured and equated to the effective output at the same date. The demand factors were (*a*) the anticipated strength of the Army, month by month; (*b*) the standard scale of armament equipment per unit; (*c*) the estimated rate of consumption or of wastage. To these must be added, in the case of all non-standard stores (*d*) the process of standardisation, that is the translation of a generic demand, say for hand grenades, into the formal specification of type, pattern and design on which a manufacturer can base his preparations. Here were three unknown, mutually interacting factors.

On the supply side the principal considerations were (*a*) the normal capacity of the established and experienced War Office contractors, (*b*) the quantities of additional output procurable by expanding the premises and duplicating the equipment of these firms, (*c*) the further increase to be secured from untried firms either such as would undertake to work for armament firms as sub-contractors, or such as might be induced to launch out into an unfamiliar type of work on their own account, (*d*) the productiveness of extraneous sources of supply, particularly Canada and the United States. Only the first of these was known. The second could be estimated, but with small reliance upon the output dates. For the rest it was a matter of guess-work; there was

as yet no basis even for estimating the effects of the intensified demand for metals, for machinery, for gauges and above all for skilled labour.

In such circumstances the problem of a munitions programme tended to become inverted. A broad estimate of maximum output could be used to determine the probable dates at which the New Armies might be expected to take the field, though this maximum was itself indeterminate. The very conception of maximum output had to be modified under the stress of increasing urgency. The maximum of normal capacity reached in August and September became the minimum of the greatly augmented capacity the provision of which was demanded of manufacturers in October and November. These resources proving totally inadequate, a further reduplication of output from new sources of supply became necessary.

For these reasons only the most comprehensive formula can be used to indicate the actual demands envisaged in the autumn of 1914. We shall not, therefore, attempt any refinement on the proposition that the situation called for the equipment of a force of half a million men in the spring of 1915, rising to 1,000,000 before the close of that year's campaign.

(*b*) Divisional Artillery and other Equipment.

The strength of the Army is one of the three principal factors for measuring demand; the other two are the scale of equipment and the rate of consumption. The former of these two may now be briefly examined. The scale of artillery equipment per infantry division had been, of course, precisely laid down for the old Army—54 18-pdr. guns, 18 4·5-in. howitzers and 4 60-pdr. guns; the Horse Artillery used the 13-pdr.—6 guns to a battery. In Territorial divisions the corresponding figures were 36 15-pdr. B.L.C. guns, 8 5-in. howitzers and 4 4·7-in. guns. The Territorial Horse Artillery were armed with the 15-pdr. Q.F. gun.

The Territorial armament, though obsolescent was serviceable and considerable use was made of these weapons in the early stages of the campaign, and until output overtook the demand for the newer types. The 4·7-in. guns in particular were used as substitutes for 60-pdrs. and were reasonably effective.

The standard small arm equipment per division may be taken as 17,000 rifles. For machine guns the scale was 2 per battalion.

The earliest modification in these standards during the period under review was a change in the scale of 18-pdr. armament caused by the adoption of the 4-gun battery as the standard in place of the 6-gun unit. The effect of this change on the total armament was, however, small, since the number of batteries in a brigade was simultaneously increased from 3 to 4, the net reductions in guns per division being thus only 6—from 54 to 48.[1] In November, a more important innovation was adopted; the scale of machine-gun equipment was doubled, and the new standard requirement became 4 guns per battalion. There was

[1] In 1916, the 6 gun standard for 18-pdr. batteries was restored. 121/Stores/8315.

also a most rapid development in special requirements dictated by the varying experience of the campaign such as siege ordnance for attacking entrenched positions, and trench ordnance and apparatus for the defence of forward positions. These highly significant extensions of the preconceived standard of equipment called in the main for supplies which had to be evolved before they could be placed on a manufacturing basis. Such stores will, therefore, be more conveniently considered in connection with the general question of design and standardisation.

(*c*) HEAVY ARTILLERY.

It had not been the view of the General Staff that the tendency of field operations to approximate towards siege warfare, as manifested under the exceptional conditions of the war in Manchuria, should be accepted as a general tendency. Nevertheless, it was the experiences of this time which led (1909) to the initiation of experiments with heavy howitzers.[1] These experiments eventuated a few weeks before the outbreak of war in the final approval of a 9·2in. howitzer. In the meantime, some slight experience had been gained with 6-in. B.L. howitzers.

At the outbreak of war, as soon as the need was evident, the War Office took up the question of providing heavy artillery. On 4 September, 1914, Messrs. Vickers were instructed to put in hand the manufacture of 16 9·2-in. howitzer equipments.[2] On 21 September, 1914, the Chief of the Imperial General Staff, Sir Charles Douglas, communicated to Lord Kitchener the first report of an expert Siege Committee which he had appointed some days earlier, the members being Maj.-Gen. Hickman, Col. Capper (succeeded by Col. Louis Jackson) and Maj. H. S. de Brett. The large programme which they put forward was finally approved by Lord Kitchener, with instructions to " proceed with all despatch," on 1 October, 1914, the advice of the French War Office having meantime been sought and the opinion elicited " Le Général en Chef des armées françaises juge très désirable que l'armée anglaise dispose le plus tôt possible des pièces de gros calibre . . . surtout en vue de l'attaque des positions fortifiées que les Allemands ont organisées." This programme involved doubling the order already given for 9·2-in. howitzers, bringing the number to 32, and, in addition, the provision of 32 12-in howitzers, a weapon of which the design was not yet settled, while some 6-in. guns were also converted into 8-in. howitzers.

With the conclusion of the battle of the Aisne and the end of the mobile phase of the war the question of siege artillery inevitably came to the front. On 29 September, 1914, Sir John French sent the following letter to the War Office[3] :—

> " I have the honour to state that, in view of the heavy artillery used by the enemy, and the strongly fortified positions which may

---

[1] HIST. REC./R/1000/119.
[2] The contract was not signed until 7 October.
[3] Q/CR. No. 165 placed in 121/Stores/215.

have to be attacked by the Army during this campaign, it is essential that more heavy ordnance should be supplied.

"I recommend, therefore, that the following be sent out as soon as they can be made ready :—

The 9·2-in. Howitzer.
One 8-in. Gun B.L.C. with its transporter.
One 10-in. High Angle Gun.

"A good supply of ammunition should accompany the guns, and the requisite means provided for transporting them, except such as must necessarily be provided locally."

As already explained the steps taken by the War Office looked far beyond this limited provision. The position at the moment is precisely defined in a memorandum addressed to G.H.Q. (France) by the Master-General of the Ordnance on 30 September, which in fact crossed in transmission the letter just quoted.[1] It ran as follows :—

I.

"I wired to you to-day saying that we had succeeded in making travelling carriages for 6-in. B.L. guns. We have made two and they have fired satisfactorily at the butts, but I am sending them to Shoeburyness to-day to try them for accuracy, and on conclusion of the practice they will be brought back by road drawn by a traction engine to see how they travel. I enclose some photographs showing the style of the thing. We can send two of these as soon as we have got the personnel and fittings together, probably the middle of next week, if you wire back and say you want them. Each gun probably would have a trailer carrying 100 rounds of ammunition, and both gun and trailer would be pulled by one traction engine.

"We are trying two different 6-in. guns, one Mark VII, the range of which is about 12,000 yards, and the total weight of gun and carriage will be about 14 tons. The 6-in. Mark VI is two tons lighter but the range is only 10,000 yards. It rests with you to say whether you would like the longer range, accepting the heavier weight. If these guns are found to be of use we could send you out six more after a short time, and even make up the total number to sixteen eventually.

"As regards the ammunition, at present we have 8,000 rounds, making 1,000 rounds for each of the first eight guns sent out. It would take some little time to manufacture more, but we shall proceed. Before getting these carriages ready, I had contemplated sending out these 8,000 shell to you for your 6-in. howitzers, as they are the 100 lb. shell and I have already told you we have no other 100 lb. shell available just yet for your howitzers, further supplies being 120 lb. shell, which lose some 1,500 yards in range.

"You will realise that my change of attitude about the 6-in. guns is entirely due to the production by the Arsenal of this new

[1] Q/CR. No. 165 placed in 121/Stores/215.

carriage, and I think that very likely Sir John French would like to have at his command guns firing up to ranges of either 10,000 yards or even slightly more in case he wishes to use them."

II.

"To-day we are firing the 9·2-in. gun on a railway truck mounting, which fires a 380 lb. shell to a range of 1,300, and we could provide three more within two or three weeks if, as I say again, you wire and say you would like them.

"You would probably have to lay a loop line for them to fire off, the line being made slightly on a curve so as to give latitude, the gun itself not being able to fire more than 5 deg. on either side of the fore and aft line. I gather that you would leave such guns well down the line at a siding, and only bring them up for some special purpose."

III.

"I am busy trying to get you a gun firing 12½-lb. shrapnel shell, mounted either on a field carriage or else on a motor lorry, to deal with aircraft, but I cannot speak with any certainty of its success for the moment."

IV.

"I am waiting to hear whether you want the single 9·2-in. howitzer, mentioned in that table I forwarded you, sent out. We hope to have four more ready during January."

In reply to this communication G.H.Q. asked on 4 October for two 6-in. B.L. guns Mark VII, to be sent at once and the remaining six to be held ready. Sir John French also intimated that he would like the 9·2-in. guns got ready, "but I do not see at present any call for this nature of railway borne ordnance. Future contingencies might, however, render the employment of this type of gun necessary."[1]

The two 6-in. guns and the 9·2-in. howitzer were despatched accordingly on the following day, 5 October. They were consigned to Antwerp but were diverted to Havre at the wish of G.H.Q. Their despatch, so Sir John French reported, had relieved him of very considerable anxiety, since "if heavy ordnance is not forthcoming when required, future operations may be seriously handicapped and protracted and increased loss of life may result."[2]

Some of the existing 6-in. howitzers had arrived at the front in time to take part in the battle of the Aisne, and Lord French tells how he watched (24 September) the battle from the mouth of a great cave opposite the village of Missy, then held by the 5th Division, and saw for the first time with his own eyes the havoc created by the H.E. shells from these guns.[3] A day or two later Sir Charles Haddon, President of

[1] 121/Stores/215. [2] *Ibid.* [3] *1914*, p. 149.

the Ordnance Board, visited the Commander-in-Chief, who then urged upon him the necessity of providing more heavy guns and ammunition for them.[1]

On 28 December, 1914, Sir John French again drew attention to the provision of heavy artillery.[2] The equipment provided for the 12 divisions of the Expeditionary Force (including the 28th Division) was :—

60 pdr. gun batteries	6
4·7-in. gun ,, ...	10
6-in. howitzer ,, ...	6
6-in. gun ,, ...	2
9·2-in. howitzer	1

Of these the 4·7-in gun was inconvenient in action and cumbersome in traction, while the 6-in. gun was inaccurate and the 6-in. howitzer deficient in range. The War Office replied on 12 January, that a large number of heavy howitzers had been ordered.

32	9·2-in	howitzers—range	10,500 yds, 290lb. shell.
24	8-in.	,, ,,	11,000 yds, 200lb. ,,
32	12-in	,, ,,	12,000 yds, 750lb. ,,

It was hoped that 8 of the 9·2-in. would be ready to go out by 1 March, and 4 of the 12-in. by 1 April, further deliveries following fairly quickly. In addition the Admiralty was providing 8 15-in. howitzers, firing a 1,400lb. shell, and possibly five of these would go out in February. The War Office added that " no steps had been taken to provide a howitzer to replace the 6-in. howitzer beyond getting designs, as manufacturers are so full of work none could be completed for five months at least."[3]

On 30 January, 1915, Sir John French put forward a special plea for an adequate supply of 6-in. howitzers on the ground that " the experience of the war has proved this weapon to be one of the most effective in the field," and it was specially necessary for the purpose of replying to the German 15-cm. howitzers which formed the backbone of the German artillery.[4] The British had only 24 of these weapons in the field or 1 battery per corps as against 4 batteries (or 16 howitzers) per corps on the German side. Sir John French therefore asked that two more batteries should be sent at once, being satisfied that the question of ammunition supply was no longer an adequate reason for withholding them, since stocks had accumulated somewhat. Finally, he urged that the production of an up-to-date 6-in. howitzer should be pressed forward, the existing type being really obsolescent. Lord Kitchener, to whom these matters were referred, at once gave orders for the despatch of the two additional batteries asked for. He also approved the placing of a trial order for 6-in. howitzers of the new type. Sir John French was informed accordingly. On 24 February, a further two batteries were asked for and these were sent on 5 March. The War Office intimated that it was only possible to supply ammunition with the guns sufficient to fill their vehicles—152 rounds per gun. All

---

[1] *1914*, p. 162.
[2] O.A.W. 70, in 121/Stores/1204.
[3] 121/Stores/1204.
[4] *Ibid.*

further supplies would have to be drawn from the stocks on Lines of Communication.[1] Sir John French in reply (19 March), again emphasised the importance of these weapons, and expressed the hope that the ammunition supply would improve sufficiently to justify a further despatch of howitzer batteries.

The German preponderance in heavy guns became more pronounced as the winter wore on, but the French, whose reserves enabled them to supply their armies more adequately than the British, had by the month of May, 1915, been able to supply heavy artillery in proportion to field guns in the ratio of 1 to 2·3, while the corresponding British proportion was 1 to 20. Sir John French's heavy artillery at this time consisted of 12 9·2-in. and 40 6-in. howitzers, together with 8 6-in. guns, his medium and light guns numbered 268 and 971 respectively. On 10 June, the Commander-in-Chief emphasised to the War Office the necessity for supplementing the supply of heavy guns as a condition precedent to a successful offensive, the possibility of which the enemy had demonstrated in Galicia. It was, he said, necessary "to make adequate provision for the reinforcements of heavy guns that are necessary to enable the Army to deliver the crushing blows that are essential for a successful offensive on a scale capable of producing important strategical results."[2]

The scale of heavy artillery equipment was one of the principal matters considered at the Boulogne Conference[3] between Mr. Lloyd George and M. Albert Thomas, the two Ministers responsible for munitions supply in Britain and France respectively, which took place at the instance of the former[4] on 19 and 20 June, 1915. Both Ministers were accompanied by technical advisers and artillery experts from G.H.Q. "There were French military officers from the Front —all artillery—and French artillery officers from Headquarters. We had General du Cane and other officers." (Mr. Lloyd George). An entirely new standard in heavy gun equipment was advocated by the French, namely, that the number of heavy guns and howitzers to be provided for each army corps engaged in trench warfare should be equal to the number of field guns supplied. All these weapons were to be of 6-in. calibre and upwards. The French had already nearly attained this ideal as far as the provision of guns was concerned, though the output of ammunition was still deficient. Field howitzers (4·5-in.) were not thought by them to be of material assistance owing to the small powers of the projectile. When, a week later, the British G.H.Q. submitted their requirements to the War Office[5] the above recommendations were adopted as the basis, except that the French view as to the field howitzer was definitely rejected. As far as heavy weapons were in question, Sir John French recommended that 6-in. howitzers should be supplied at the rate of one battery per division. In addition, heavy howitzers were asked for in the proportion of eight

---

[1] Letter of 13 March, 1915 (121/Stores/1204).
[2] Hist. Rec./R/1300/122.
[3] Memorandum on Supply of Heavy Guns, October, 1915.
[4] Hist. Rec./R/1000/11.
[5] D.M.R.S. 30.

8-in. or 9·2-in. howitzers (two batteries) for each army corps of three divisions and four very heavy howitzers, 12-in. or 15-in. for each army of three corps. These, however, were minimum and not full requirements, and the War Office was asked to increase its efforts with a view to securing double this equipment by the spring of 1916, when the scale would be :—[1]

13 pdr. A.A. guns	2 per division.
18 pdr. guns	48 ,, ,,
4·5-in. howitzers	16 ,, ,,
60 pdr. guns	8 ,, ,,
6-in. howitzers	8 ,, ,,
8-in. or 9·2-in. howitzers	16 per army corps.
12-in. or 15 in. howitzers	8 per army.

These were the requirements which, as will elsewhere be narrated in greater detail,[2] formed the foundation of the first programme adopted by the new Ministry of Munitions.

(*d*) Ammunition Ration : Rounds per Gun.

The reserves of artillery ammunition available when war broke out were limited to a fixed scale of rounds per gun :—

13 pdr.	1,900 rounds per gun.
18 pdr.	1,500 ,, ,, ,,
4·5-in.	1,200 ,, ,, ,,
60 pdr.	1,000 ,, ,, ,,

This scale was based upon the anticipation that the campaign would be one in which general engagements were occasional, and in which intervals of movement or readjustment of position would obviate the need for continuous expenditure. The actual consumption should, on this hypothesis, have been readily made good within the estimated period of six months over which the expenditure would be spread, and it was laid down that provision should be made within this period for securing additional supplies on the scale of 500 rounds for each field gun and 400 rounds for each field howitzer.[3] The falsification of this hypothesis was, of course, absolute, and the miscalculation was incomparably most serious for the British, who had assumed the task of equipping and maintaining forces out of all proportion with their pre-war Army. Even for the combatants who were better prepared the situation was grave enough. As Mr. Lloyd George put it, speaking in April, 1915 :—[4]

> " In this war more ammunition has been expended than any army ever anticipated. That is not a miscalculation confined to us. There is not an army in the field at the present moment that ever dreamt there would be such an expenditure of ammunition

---

[1] This standard involved the gradual elimination of the 15 pdr. B.L.C. and the 4·7-in. gun. (Hist. Rec./R/1000/8.)

[2] See below, p. 42.

[3] Hist. Rec./R/1000/119, p. 10.

[4] *Parliamentary Debates* (1915), *H. of C.*, LXXI, 313.

> as has taken place. I had the privilege of seeing one of the great French generals when I was over there on this very question of ammunition . . . and he said to me :—'The surprise of the war has been the amount of ammunition which we have had to expend. . . . The ordinary ideas of strategy were that after three or four weeks of manœuvring you would have a great battle, and that that battle might occupy a fortnight or three weeks, and, of course there would be a very great expenditure of ammunition, and we thought that after that one or the other of the parties would have been defeated. There would have been a retreat, a reconstruction, and the other army would have advanced, and perhaps after a month's time we would have another great fight. But for seventy-nine days and nights my men have been fighting, and firing has gone on almost night and day by these great cannons.'"[1]

No one ever dreamt, as he said, of the expenditure of ammunition at that rate, and it is perfectly clear that the Germans also were taken by surprise. 'By mid-September,' says Falkenhayn, 'the spectre of the shortage of munitions was already apparent . . . Consumption exceeded peace time estimates many times over.'[2]

At this time Sir John French also was finding great difficulty in maintaining his stocks, since the expenditure was constantly outrunning receipts. His 18-pdr. guns, he records, on 28 September, were firing 14 rounds per day, receipts being only 7 rounds per gun per day, while the few 60-pdr. guns and the 4·5-in. howitzers fired more than 40 rounds per gun per day.[3] The War Office took anxious counsel with General Deville, the head of the French Ordnance who came over on 22 October.[4] The Expeditionary Force was at this time being reformed on the Flanders front, and was preparing for the intensified fighting incidental to the first battle of Ypres. The anxieties of the moment were greatly increased by the pronounced shortage of ammunition supplies. On 29 October, Sir John French reported that he had been compelled to restrict the expenditure to a ration of 20 rounds per gun per day, and that even that rate could not be maintained unless better supplies were received.[5] Lord Kitchener was, of course, fully alive to the gravity of the position. "The supply of ammunition," he wrote on 31 October, "gives me great anxiety . . . at the present rate of expenditure we are certain before long to run short."[6] And this shortage of supply continued to hamper the campaign and restrict its advantageous development. The situation was but aggravated by the increased number of guns which were added from time to time to Sir John French's command. Early in January, 1915, Lord Kitchener addressed

---

[1] This was realised by the French as early as September, 1914, when they found during the battle of the Marne, that "les canons de 75 devoraient en quelque jours des stocks de projectiles qui paraissaient suffisants pour des semaines, peut-être des mois." Rapport de M. Perchot, Senate Document 284 (1916), p. 3.

[2] *Memoirs* (Morning Post, 10 November, 1919).

[3] 121/Stores/216.

[4] Hist. Rec./R/1000/120.

[5] 121/Stores/216.

[6] *Life of Lord Kitchener*, III, 74.

to Sir John French a memorandum embodying the conclusion of a War Council presided over by the Prime Minister on 7 and 8 January, which dealt primarily with Sir John French's plan for an advance along the Belgian Coast. This memorandum contained the following passage :—

> " It is impossible at the present time to maintain a sufficient supply of gun ammunition on the scale which you considered necessary for offensive operations. Every effort is being made in all parts of the world to obtain an unlimited supply of ammunition ; but as you are well aware, the result is still far from being sufficient to maintain the large number of guns which you now have under your command adequately supplied with ammunition for offensive purposes."[1]

But the Commander-in-Chief needed more and yet more artillery to enable him to carry out his plans. " In order," he wrote on 3 January, 1915, " to attain the double object of relieving the French troops and thus strengthening the Allied forces at the decisive points, and of undertaking a vigorous offensive to effect the capture of Ostend and Zeebrugge, it is absolutely necessary that I should have more troops, a liberal supply of artillery ammunition of all kinds, but especially high explosives, and a sufficient number of heavy guns."[2]

Though the need for " a liberal supply of artillery ammunition " had been urgent for many weeks it had not been precisely formulated. The possibilities of maintaining supply at a definite prescribed rate of expenditure which experience had dictated was now formally challenged. On the last day of 1914, Sir John French forwarded to the War Office a statement of his estimated requirements expressed as a scale of income supply per gun per day :—

REQUIRED OUTPUT OF AMMUNITION.[3]

	Rounds per Gun per day.
13 pdr.	50 (25 H.E.)
18 pdr.	50 (25 H.E.)
4·5-in. Howitzer	40 (35 H.E.)
60 pdr.	25 (15 H.E.)
4·7-in.	25 (15 H.E.)
6-in. Howitzer	25 (all H.E.)
6-in. Gun	25 (all H.E.)
9·2-in. Howitzer	12 (all H.E.)

Such a scale of supply would allow of the accumulation of reserves during periods of less active fighting.

These standards were far in excess of any scale of supply hitherto contemplated, and when translated into total requirements per month for all guns present and prospective made a most alarming aggregate. Lord Kitchener again appealed to the French for advice as to what number of rounds per gun per day they regarded as necessary in the light of their experience during the autumn campaign.

The reply he received was as follows :—[4]

---

[1] *1914.* Chapter XV.
[2] Hist. Rec./R/1000/72.
[3] *1914,* Chapter XVIII.
[4] *Life of Lord Kitchener,* III, 276.

Le Ministre de la Guerre de France, répondant à la question que vous m'avez prié lui poser, me prie de faire connaître à Votre Excellence ce qui suit :

" 1. Le chiffre de 25 coups par pièce et par jour a été admis pour assurer le coefficient indispensable, en se basant sur la consommation atteinte pendant plusieurs mois, et notamment en Flandre où les corps engagés ont tiré du 25 octobre au 23 novembre, 33 coups par pièce et par jour en moyenne.

" 2. Il estime cependant que l'armée anglaise pourrait se contenter d'un chiffre moindre, car elle a, dans l'offensive, des procédés un peu differents des nôtres, et garde toujours des forces importantes en seconde ligne, pour les besoins de la relève."

It may be noted that the conclusions drawn from this pronouncement by the War Office did not apparently convince G.H.Q. " According to the experience of the French Army," the Army Council wrote, " based on a much larger number of troops and guns over a much longer line than that occupied by the British Army, a figure of 20 rounds a gun has been accepted by them as being sufficient, and this, they remark, may be more than sufficient for our requirements." " So far," replied the British Commander-in-Chief, " from a large Army with many guns acting on a very extended front requiring a larger number of rounds per gun per day than a small army, the contrary is the case. . . . It stands to reason that a small force is more likely to find a larger proportion of its troops engaged in severe fighting than a large one." Therefore, as the Army increased in strength it should prove possible to make a reduction in the scale of requirements for field artillery.

The Army Council in communicating the French opinion (quoted above) to Sir John French on 19 January 1915, pointed out[1] that the French authorities were hoping to work up their own output to 20 rounds per gun per day. They stated that they were " thoroughly alive to the urgent importance of increasing gun ammunition for the Expeditionary Force, and have spared, and will spare no effort to secure this end." Success was imperilled by the shortage of available labour ; but " the Council desire to emphasise the fact that the orders for manufacture are not being limited by what they think it necessary to supply, but are entirely conditioned by the highest possible output of the ordnance factories throughout the Empire and the trade of England and the allied and neutral countries of the world." The Army Council further undertook that " if and when the figure of 20 rounds a day for every gun in the field is attained " they would not relax their efforts but would aim at whatever further increase experience should indicate as necessary. The provision of 20 rounds per gun per day was thus formally accepted as the objective, though the standard actually adopted by the War Office as the effective minimum scale of requirements gave 17 rounds per gun to the field guns. This figure was accepted as a minimum standard at a meeting between the British and French

[1] HIST. REC./R/1000/119, p. 28. Mr. Asquith's Speech of 3 June, 1919. HIST. REC./R/1300/109.

War Ministers and Commanders-in-Chief, which took place at the French Army Headquarters later in the spring of 1915.[1] It was then agreed that in order to render more effective the co-operation of the British Army in the contemplated French offensive it was necessary that ammunition supply should reach the scale of 17 rounds per gun per day for the field gun and other natures in proportion. No lesser quantity would be adequate for a sustained offensive. Thus the War Office standard during the spring of 1915 was : 17 rounds for field guns and field howitzers, (18 pdr., 15 pdr., 4·5-in., 60 pdr.) ; 10 rounds for the 4·7-in. gun ; 5 rounds for heavy howitzers (6-in., 8-in., 9·2-in., 12-in.).[2] This, of course, was a minimum scale necessitated by the actual shortage ; and in at least one important nature, the 6-in. howitzer, did not cover the prevailing rate of expenditure.[3] In a memorandum sent to Mr. Lloyd George on 10 May, 1915, Sir John French reaffirmed his need for a more generous allowance per field gun with proportionate rations for other guns.[4]

> "We have found by experience" he wrote, "that the field guns actually engaged in offensive operations such as Neuve Chapelle, fire about 120 rounds per gun per day. Heavy guns and howitzers according to their calibre fire less in proportion. The guns of the whole army are, of course, never equally heavily engaged at the same time, but the number of guns available and the amount of ammunition are the limiting factors when a plan of attack is being considered. There is, therefore, scarcely any limit to the supply of ammunition that could be usefully employed. The more ammunition the bigger the scale on which the attack can be delivered, and the more persistently it can be pressed."

Demands must, however, be reasonable, and the position would be materially improved if the supply reached the standard of 24 rounds per field gun per day (50 per cent. H.E.) and other guns in proportion.

A month later, the Commander-in-Chief communicated to the War Office an elaborate memorandum[5] reviewing the whole subject of the past and future supply and requirements of artillery ammunition, and enclosing an estimate of requirements in rounds per gun per day. These rations were accordingly adopted by the War Office and were set before the newly-created Ministry of Munitions as the basis on which future supplies should be calculated.[6] Twenty-five rounds per gun per day was the new scale for light guns (18 pdr., 15 pdr., 13 pdr.) ; 20 rounds for 4·5-in. howitzer and 60 pdr. gun ; 15 rounds for 4·7-in. gun, 5-in. howitzer, 6-in. howitzer and 8-in. howitzer ; 12 rounds for the 9·2-in. howitzer and 5 for the 15-in. howitzer. A ration of 10 rounds was also asked for for trench mortars, the first time a regular scale had

---

[1] 121/Stores/2765. Lord Kitchener's memorandum of 31 May, 1915 speaks of the "17 rounds that Sir John French and General Joffre have decided as being the amount that they require." HIST. REC./R/1000/120, p. 5.
[2] HIST. REC./R/172/7.
[3] *Ibid.*
[4] *1914*, p. 358. HIST. REC./R/1000/119, p. 45.
[5] Dated 10 June, 1915. (121/Stores/2765).
[6] HIST. REC./R/1300/6.

been put forward. The result of these successive formulations may be set out in comparative form, concluding with the maximum scale attained in 1916.

Scale of Rounds per gun per day Requested or Approved at Various Dates.

	Commander-in-Chief 31.12.14	*War Office. 13.4.15.*	*Commander-in-Chief 10.5.15.*	*Commander-in-Chief 10.6.15.*	*Maximum.*
18 pdr. Q.F. ..	50	17	24	25	50 (1916)
15 pdr. B.L.C. ..	—	17	24	25	—
13 pdr. Q.F. ..	50	—	24	25	—
4·5-in. Howitzer ..	40	17	20	20	38 (1917)
5-in. Howitzer ..	—	—	15	15	—
60 pdr. ..	25	17	16	20	37½ (1917)
4·7-in. Howitzer ..	25	10	16	15	—
6-in. Howitzer ..	25	5	12	15*	43½ (1918)
6-in. Gun	25	—	—	12	30 (1918)
8-in. Howitzer ..	—	5	—	15	33 (1917)
9·2-in. Howitzer ..	12	5	12	12	30 (1916)
12-in. Howitzer ..	—	5	—	5†	10 (1916)
15-in. Howitzer ..	—	—	—	5	7 (1916)

* Raised to 20 on 15/7/15. † Raised to 8 on 31/7/15.

The standards of June–July, 1915, were in all important cases largely increased the following year, when Sir John French's original standard of 50 rounds per gun was prescribed. The final scales adopted in later years receded somewhat from this maximum.[1]

(*e*) High Explosives versus Shrapnel.

Demand for ammunition has to do not alone with the volume of supply, but with the nature of product. In particular, the difficulties of supply 1914–1915, were concerned not alone with the general shortage of output, but in a special degree with the deficient supply of high explosive shell, which the conditions imposed by a war of position rendered a matter of extreme urgency.

At the outbreak of war the standard types of ammunition and the relative proportions of shrapnel supplied were as follows :—

Royal Field Artillery	18 pdr. (Shrapnel only).
Royal Horse Artillery	13 pdr. ,, ,,
Field howitzers	4·5 in. howitzer (70 per cent. Shrapnel, 30 per cent. H.E.).
Heavy field guns	60 pdr. (70 per cent. Shrapnel, 30 per cent. H.E.).
Heavy howitzers	6-in. 30 cwt. (H.E. only.)

[1] See Vol. X, Part II, Chap. I. Hist. Rec./H/1300/16.

The decision to rely exclusively upon shrapnel ammunition for the field gun was taken at the time when the 15 pdr. gun was superseded by the 18 pdr. It was then thought that the provision of a proportion of high-explosive ammunition for field howitzers would adequately meet the need.[1] In 1912 the Serbians employed high explosive field-gun ammunition against the Turks with good results.[2] The adoption of the new type of ammunition by the French Army was already an accomplished fact. Steps had also been taken to produce for the British Army a shell of the universal type such as had been introduced by Germany, this being a combination of the H.E. and shrapnel principles. The conclusion of the experimental stage had hardly been reached, however, when war broke out.

On 31 August, 1914, the Master-General of the Ordnance, Major-General Sir Stanley von Donop, wrote to Major-General Lindsay, the General Officer Commanding, Royal Artillery in France, asking if the provision of high explosive shell for field and horse artillery should be taken up. The reply was given on 4 September. "If you have safe explosives for field guns by all means proceed to manufacture." On receipt of this communication the Master-General of the Ordnance re-stated his offer to the Chief of the General Staff. "If you want some high explosive common shell—not high explosive shrapnel—for your field guns I could probably send you out some for the 13-pdr. and later, if you wished it, I could probably make you some high explosive shrapnel or high explosive common for the 18 pdr. But the former has only just completed its experimental stage, and I do not want to hamper the manufacture of the service ammunition until I have ample reserve." On 15 September the Chief of the General Staff, Sir Archibald Murray, replied in conclusive terms stating that Corps Commanders had so far as possible been consulted, and that the general opinion in which the Commander-in-Chief concurred, was that high explosive ammunition for field guns "should be supplied as soon as possible."[3]

Even before this message arrived the matter was being actively investigated, and experimental filling of 18 pdr. shell with T.N.T. was in progress at the Royal Laboratory. The chief difficulty was the detonating system, but a makeshift method of fusing was found practicable by using a combination of the existing direct action fuse No. 44 with the ordinary time fuse No. 80. An order for 20,000 rounds was placed with the Ordnance Factory on 5 October,[4] and issues of completed ammunition to France began on 22 October, the whole order being discharged by February, 1915. By the latter date very extensive arrangements for future supply had been completed.

---

[1] Hist. Rec./R/1000/119, p. 24.

[2] Sir C. E. Callwell, K.C.B., *Morning Post*, 16 June, 1919. Sir John French at this time was Chief of the Imperial General Staff.

[3] Hist. Rec./R/1000/119, p. 26.

[4] Hist. Rec./R/1122.11/16.

Issues of 18 *pdr. H.E. Cartridges to France. Extract L.47/322.*

22	October, 1914	1,000
2	November, ,,	912
4	,, ,,	64
6	,, ,,	176
11	,, ,,	280
16	,, ,,	728
17	,, ,,	560
19	,, ,,	168
22	,, ,,	112
27	,, ,,	680
2	December ,,	408
4	,, ,,	60
7	,, ,,	284
6	,, ,,	568
12	,, ,,	652
13	,, ,,	480
15	,, ,,	108
17	,, ,,	420
20	,, ,,	468
22	,, ,,	700
30	,, ,,	164
		8,992
3	January, 1915	1,000
10	,, ,,	1,946
14	,, ,,	52
18	,, ,,	1,000
25	,, ,,	1,996
2	February ,,	1,952
10	,, ,,	448
15	,, ,,	600
22	,, ,,	1,014
18	,, ,,	1,000
		11,008
	Grand Total	20,000

Such was the trickle which was destined to become a torrent—but only after many delays and disappointments.

The day when the first consignment was dispatched, 22 October, 1914, was also the occasion of the visit of General Deville to the War Office to discuss the ammunition problem with the Secretary of State. He was able to explain to the War Office the policy adopted by the French of abandoning shrapnel for field guns and substituting high explosive shells fused with delay action so as to burst in the air on ricochet.[1]

There was as yet no graze fuse available. Consequently this new ammunition could not be employed so effectively on wire as could the French shell, and its utility against fortified posts became less as the original shallow trenches were succeeded by systems of deep and well-protected shelters.

A favourable report on the first issues was made by G.H.Q. on 6 November, 1914, and about this time it was requested that future

[1] Hist. Rec./R/1000/119, p. 26.

supplies of 18 pdr. ammunition should include 25 per cent. high explosive shell. This demand was reiterated on 31 December, 1914, when in addition it was further asked that the 4·5-in howitzer ration should contain 35 per cent. H.E. and the heavy howitzers 100 per cent. The 60 pdr. and 4·7-in. gun, on the other hand, were to be reduced to 15 per cent. H.E.

The question of the relative value of high explosive and shrapnel shell continued to be a matter for investigation. Trials carried out under Sir John French's direction in January, 1915, showed that rather better results could be obtained in clearing wire entanglements by the use of 18 pdr. shrapnel than with the high explosive, and at Neuve Chapelle good results were realised from the use of the former.[1] Sir John French's demands for high explosive ammunition, however, became increasingly urgent. On 18 March, 1915, he drew attention to the dangerous inadequacy of his supplies, and made an emphatic demand that steps should be taken to improve the supply of high explosive ammunition for the 18 pdr., 4·5-in. and 6-in. howitzer.[2] When formulating his requirements in June, Sir John French again pressed for an allowance of 50 per cent. high explosive for his field guns, as justified by recent experience. "Shrapnel is invaluable for beating off attacks, forming barrages of fire to prevent the intervention of fresh hostile troops in the fight, cutting wire and exploding communication trenches. H.E. cuts wire equally well, and, in addition, will destroy earthworks and buildings and generally fulfil functions for which shrapnel is unsuitable." A particularly liberal allowance was asked for in the case of 4·5-in. howitzer (80 per cent.), while for the Territorial weapons—15 pdr. and 5-in. howitzer—a proportion of 75 per cent. and 100 per cent. respectively was recommended, on the ground that this form of ammunition was most suitable for less highly trained troops. For the 4·7-in., 60 pdr. and 6-in. guns 50 per cent. was desired, and 100 per cent. for all howitzers of 6-in. or larger calibre. As regards the 6-in. howitzer ammunition in particular, Sir John French had reported in January, 1915, that the lyddite shell was proving more useful, and that shrapnel would no longer be required.[3] It was even suggested that available 6-in. lyddite ammunition should be diverted from the guns to the howitzers; the long-distance shrapnel fire of the 6-in. guns, on the other hand, was becoming increasingly valuable. As was made clear when these proposals were considered at the Boulogne Conference on 20 June, 1915, the importance of the high explosive question was no longer exclusively or mainly concerned with the provision of 18 pdr. H.E. The French view urged upon this occasion brought about the recognition of the vastly greater significance of heavy artillery, and this artillery, they urged, should be provided with H.E. ammunition exclusively, and fused partly with delay and partly with direct action fuses.[4] Thus the question took on

---

[1] Hist. Rec./R/1000/119, p. 29.
[2] 121/Stores/1214.
[3] Letters of 17 and 26 January (121/Stores/1392).
[4] Lord Kitchener's Memorandum, Oct. 1915. (Hist. Rec./R/1200/56.)

a new aspect. It was no longer primarily a matter of ammunition supply, but was now a question of the provision of heavy guns.

Owing to the formidable difficulties which had been experienced in evolving an effective method of detonating the 18 pdr. H.E. ammunition—a problem which was governed and complicated by the necessity for adopting for the bursting charge an amatol 40/60 mixture which was only sanctioned in May, 1915—and the fact that after fuse No. 100 came into supply in the summer, it became necessary to re-design the gaine in order to counteract the proclivity towards "blinds" or, worse still, "prematures," it was not until the spring of 1916 that a thoroughly reliable bulk supply of this ammunition was available. By this time, however, the need for it had become far less urgent. As early as January, 1916, doubts began to be expressed by the Ministry's advisers as to the need for maintaining output in equal proportions between shrapnel and H.E.[1] Shrapnel was definitely preferred for wire cutting, and for these, and other reasons, the experience of the winter pointed to a marked tendency for the consumption of shrapnel to outrun that of high explosive. This view was confirmed by a letter from G.H.Q. in April asking for the proportion of shrapnel to be maintained at 70 per cent., and this remained the predominant rate for the remainder of the war.

(*f*) Novel Equipment: Design as Pre-requisite to Supply.

We have dealt so far with stores with which the old Army was familiar, and which had been definitely prescribed as necessary to the equipment of the Expeditionary Force. We have now to consider the measurement of demand in the case of those additional munitions, the need for which was demonstrated by the experience of the campaign. In such circumstances requirements were primarily generic rather than specific, qualitative rather than quantitative. Thus the Army found itself from time to time in urgent need of the means both of defence against and of reply to forms of attack which their existing equipment was not calculated to deal with. First it was the heavy German howitzers flinging their "Black Marias" or their "Coal Boxes" against troops who had to rely on their field-gun shrapnel and their light howitzers. And simultaneously there developed an even more imperious need for high explosive projectiles for use both in attack and defence. With November, 1914, came a whole set of novel requirements for the purpose of the stationary warfare which supervened after the first battle of Ypres. The cry was now for hand grenades, rifle grenades, trench mortars and ammunition, periscopes, catapults, barbed-wire entanglements, trench helmets and special appliances of other and very various kinds. In April, 1915, after the second battle of Ypres, it became necessary to provide all the apparatus—defensive and offensive—for gas warfare. Similarly, new demands again were necessitated by the development of aerial warfare. Indeed, every arm of the service underwent a similar transformation.

---

[1] See Hist. Rec./H/1300/16, Vol. X, Part II, Chap. I.

All these new demands have one feature in common, that the general demand was followed after a very brief experimental stage, if good results were attained or even promised, by demands for bulk supply long before the pattern had been standardised. But bulk supply involves mass production, and mass production is only possible after stability of design and fixity of pattern have been arrived at. Inevitable loss, delay and disappointment are the consequences entailed by the premature organisation of an extensive manufacturing unit with its series of processes carefully balanced in sequence and velocity, which is then subject to a compulsory readjustment at a single stage in order to conform to a modification of design. That stage is practically certain at least to constitute a "bottle neck," which will delay the flow of materials from machine to machine or process to process and the efficiency of the whole organisation will thus be impaired. It is a commonplace of mechanical industry, that the full momentum of output can only be attained after a lengthy period of tuning up, even when the design of the article to be manufactured is settled and the accessories and special forms of equipment, such as tools, jigs, and gauges, are at hand. When, as was often the case during the first year of war, orders were given for articles the design of which was merely provisional and the drawings and gauges for which were not available, there could be no real programme of supply. Thus, the war imposed upon British manufacturing ingenuity the severest of all possible tests; the need for perpetual readjustments in process while maintaining or increasing output. There was no way of evading the necessity which demanded that the development of design should proceed *pari passu* with the development of manufacture. The munitions themselves had first to be evolved, and all the time that this process was laboriously and painfully progressing every nerve had to be strained to increase to a maximum the output of such weapons as were already standardised and authorised.

A comparison of the equipment of the Expeditionary Force with that of the armies which took part in the first battle of the Somme will be sufficient to emphasise this contrast. Rifles and small arms ammunition, light and heavy field guns and field howitzers (18 pdr., 60 pdr., and 4·5-in.) as well as 13 pdr. guns for the Royal Horse Artillery were available, but there was an inadequate equipment of modern machine guns. There was, as has been seen, no high explosives ammunition for the 18 pdr. or 13 pdr. guns and only a small proportion of lyddite shell for the 4·5-in. and 60 pdr. guns, There was no authorised fuse suitable for adoption with the newer form of high explosive which was itself an innovation, and the output of which had consequently to be organised. There were no grenades, no trench mortars, or other forms of short range projector. There were no helmets or other devices for personal protection of troops. Of the weapons which later played the most prominent part—the heavy howitzers, the long range guns, to say nothing of the aeroplane in its developed form, or the tank—there were virtually none, the solitary exception being a single experimental 9·2-in. howitzer and such heavy ordnance as had previously been provided for purposes of coast defence or as siege artillery. There were, of course, no preparations for gas or chemical warfare. By the summer of 1916,

on the other hand, not only was the equipment of the greatly enlarged Army maintained on the original scale, but the troops enjoyed the support of a large number of heavy howitzers with a generous supply of ammunition, an increased equipment of machine guns, a supply of trench mortars of light and medium weight, and an abundant provision of hand grenades and helmets.

It will be worth while to review with more particularity the evolution of design for one or two representative supplies during the first year of war.

High Explosives.—The high explosive bursting charge for artillery projectiles in use at the beginning of the war was picric acid. At this time it was about to be superseded by T.N.T., a less sensitive though equally powerful explosive. The principal obstacle to making this change was the difficulty of securing satisfactory detonation. Two special D.A. fuses for this purpose had been introduced, adapted to large and small shell respectively, but there was, as yet, no graze fuse for securing detonation on ricochet.

The use of T.N.T. was approved in September, 1914, and some 18 pdr. H.E. shells were loaded with it experimentally. These shells formed part of the first consignment of shells issued from Woolwich to France on 22 October, 1914. They were detonated by a combination fuse No. 44/80. The supply of the new explosive was, however, very limited and at this time involved a wasteful use of oleum which was also required for propellant manufacture. Lord Moulton, who was called in to advise in November, 1914, promptly reported that the maximum procurable amount of both picric acid and T.N.T. would prove altogether inadequate, and that mixed explosives must be substituted for plain T.N.T.

The use of Schneiderite and ammonal, as alternative fillings, had been investigated in consultation with the French, and both forms of filling were tested, but with inconclusive results. On 10 March, 1915, the Research Department put forward a fresh proposal—the use of a mixture in which plain ammonium nitrate served to dilute the T.N.T. On 15 April, the Ordnance Board agreed to approve the use of such a mixture (55 per cent. of ammonium nitrate) for land service shell of calibre not exceeding 6-in. Owing to difficulties in filling shell with this mixture, the proportion of ammonium nitrate was reduced to 40 per cent. and this 40/60 mixture was approved on 11 May, 1915, for small shell, though approval was withheld in the case of heavier natures until August. In April, experiments with an 80/20 mixture by pressing instead of melting had been carried to a successful conclusion and was approved for loading straight walled 13 pdr. and 18 pdr. shells. But serious detonation difficulties remained to be overcome. The new graze fuse (No. 100) was produced in August. Both this and the provisional fuses No. 80/44 required a gaine, and to this minor accessory the unsatisfactory results obtained in the field were attributed, both prematures and blinds being reported. By March, 1916, satisfactory trials with a modified fuse No. 101 and a new type of gaine showed that the problem of using the 80/20 nature had at last been solved. Picric acid remained in use for particular types of shell until 1918.

The evolution of artillery equipment was the work of skilled experts. There existed no body of technical experts whose primary function was the development of other novel classes of munitions. Hence the development of the comparatively simple weapons employed in trench warfare was at first subject to delays as lengthy as those which attended the evolution of the far more complex high explosive shell.

Mills Grenade.—The Mills grenade may be selected as a typical example of the new trench warfare requirements. Urgent demands were received early in December, 1914, for large quantities of grenades. The first request was for 2,000 rifle grenades and 4,000 hand grenades per week; in January the demand for hand grenades became 10,000 per week; that for rifle grenades was raised to 5,000 in March. In June the total was raised from 15,000 to 42,000 for France alone. In July the demand for a single type (Mills) was 500,000 weekly, and a year later this became 1,000,000.

At the outbreak of war a few Service patterns of grenades existed, but these were of such complexity that rapid or bulk supply was unattainable. Improvisation was, therefore, resorted to both by manufacture in the field and by contract production of experimental types of grenades at home. Many of these emergency patterns, however, proved to be dangerous and unreliable, so that the troops lost confidence in them. Large quantities of the "Ball" grenade, for example, were available for the battle of Loos, but their utility was destroyed by the prevalent wet weather.

The pattern of the Mills grenade was first submitted about January, 1915, and the experimental stage was complete by April. Output began in July. By the end of the year it had reached 800,000 a week, and 4½ millions were supplied during the last quarter. But even in September, 1915, or ten months after the original need for such supplies was formulated the Army was still equipped principally with stop-gap patterns ("Ball" and "Pitcher" principally), including in all, eleven varieties. These were the supplies with which the battle of Loos was fought.[1] The limiting factor in the output of the Mills grenade up to this time (September, 1915) was the provision of detonator sets.

Comparison may be made with the case of a demand for a special anti-tank grenade in May, 1918, when the accumulated experience of three and a half years of war was available. Manufacture was facilitated by the use of important components secured by breaking up another type of grenade, and bulk supply began in August.[2]

Trench Mortars.—The supply of special trench ordnance was first proposed by the War Office Siege Committee on 25 September, 1914. A month later (20 October) G.H.Q. put forward a general request for

[1] The case of trench mortars is closely parallel, as the Army was still obliged to rely upon the emergency 3·7-in. "pipe gun," the only weapon for which ammunition in appreciable quantities was available.

[2] In the case of the Liven's projector first improvised in July, 1916, and finally approved in December, manufacturing difficulties were not serious and bulk supply was available from April, 1917. This may be counted an instance of very rapid supply.

supplies of this kind. By January there had been supplied twelve 4-in. mortars made by boring out a 6-in. shell, and a score of 3·2-in. mortars of a pattern which had been devised by the Indian Corps. In January a design of a 1·57-in. trench howitzer introduced by Messrs. Vickers was approved, and 127 were issued by the end of June. In March, 1915, the 2-in. mortar was reported on as acceptable to G.H.Q., and 25 were issued by the end of June. By the beginning of April, 1915, there were 106 trench howitzers in France, a figure which was trebled during the next three months. This latter total comprised 127 of the 1·57-in., 25 of the 2-in., 125 of the 3·7-in., and 40 of the 4-in. weapons.[1]

At this time, therefore, the Army was supplied with small numbers of four different types, two of which were improvisations or stop gaps.[2] The output of ammunition was, however, even more unsatisfactory, since nearly every design authorised by the War Office involved the use of fuses even more urgently needed for artillery ammunition. Two of them threw a shell less than 10 lb. in weight, and only 50,000 rounds in the aggregate had been manufactured by June, 1915.

III. Evolution of the Programme.

(*a*) Hand to Mouth Demand.

The earliest munition orders that were given on the outbreak of war were of a prescribed character, intended to provide for the replacement of ammunition that would be consumed by the Expeditionary Force during the first six months of the war. These demands, it must be remembered, represented the full scale of supply capacity, the need for which had been definitely anticipated. But even before they had been completely translated into contracts instructions were issued (10 August) for the provision of equipment required by the first New Army,[3] and as has been related above, the scale of demand grew from this time in volume and intensity with almost uninterrupted continuity.

The rate of expenditure raised a problem of the first magnitude. It is sufficient to recall the fact, for example, that when the war began the total available supply of 18 pdr. gun ammunition, including 108,000 rounds subsequently received from India, was only 654,000 rounds, part of this being held in the form of components which had to be built into complete rounds. By 1 November 385,000 rounds had been expended.[4] The total amount was, in fact, not expended until February, 1915, and was thus spun out over the prescribed period of six months, though at a cost to the Expeditionary Force which is

---

[1] Hist. Rec./R/1000/39.
[2] The 4-in. and 3·7-in. were withdrawn in the spring of 1916.
[3] Hist. Rec./R/1000/119, p. 5.
[4] Hist. Rec./R/1000/120.

now clearly recognised.[1] The corresponding amounts of 4·5 in. ammunition (129,600 rounds) and 60 pdr. ammunition (24,000 rounds) were exhausted by mid-December and the end of November, 1914, respectively.[2] By March, 1915, 2,000,000 rounds of all natures had been issued to the front, less than half of which aggregate had been in existence when war broke out.

The War Office was concerned not only with these current deficiencies, but at least equally with the prospects of securing the output prospectively required for the equipment of the New Armies. As we have already seen it was impossible in the autumn of 1914 to draw up a formal programme of future supplies at specific dates. The only form which a supply forecast could take at this time was a tabular statement of aggregate output promised by contractors. Such returns were compiled, and indicated month by month ahead the output which contractors were pledged to produce. It was not yet realised how utterly unreliable *as regards early deliveries* these promises were likely to prove. But even had they been trustworthy, it would only have been the first step in the calculation ; for the contracts were placed in the main for components and not for complete ammunition. The business of adjusting and balancing the flow of these components and securing a rapid and uninterrupted output involved many other factors, the incidence of which could not as yet be estimated.

A forecast of such a character with or without elaboration and refinement takes the form of a supply programme. It is totally different from an estimate of requirements based on an assumed number of rounds per gun per day for a force of a postulated size such as was submitted by the Commander-in-Chief from time to time. The latter may be called a demand programme. A complete programme is one which includes both aspects. This will be clear when some examples have been examined.

(*b*) A Supply Programme.

The work of recording and tabulating contractors' promises of output was of course one of the regular duties of the Contracts Department, though the fact that the Master-General of the Ordnance was not responsible for this part of the contracts work until January 1915, presumably weakened the contact between that branch and the technical advisers of the Director of Artillery. The first time such estimates were officially put forward appears to have been unfortunate in its failure to guard against the failure of paper pledges. The Army Council when replying to Sir John French's despatch of 31 December, 1914, enclosed a forecast of monthly output up to May, 1915, containing the following anticipations.[3]

---

[1] The number of 18 pdr. guns in the field at this latter date was approximately double that on which the pre-war estimates of ammunition required had been based.

[2] Hist. Rec./R/1300/49.

[3] Hist. Rec./R/1300/122.

Estimated Approximate Output of Ammunition.

1915.		January.	February.	March.	April.	May.
18 pdr.	S.	134,000	170,000	260,000	460,000	490,000
,, ...	H.E.	6,000	10,000	50,000	100,000	120,000
13 pdr.	S.	11,000	12,000	15,000	24,000	28,000
,, ...	H.E.	—	1,500	3,000	10,000	12,000
4·5-in.	S.	14,000	17,000	20,000	24,000	24,000
,, ...	H.E.	14,000	18,000	26,000	32,000	32,000
60 pdr.	S.	12,000	12,000	13,000	14,000	14,000
,, ...	H.E.	12,000	12,000	14,000	14,000	14,000
4·7-in.	S.	6,000	6,000	6,000	6,000	6,000
,, ...	H.E.	6,000	6,000	7,000	7,000	7,000
6-in. How. ..	S.	2,000	500	1,000	1,000	1,000
,, ..	H.E.	3,000	3,500	5,000	5,000	5,000
6-in. Gun	S.	*	500	1,000	—	—
,, ..		*	1,500	2,000	2,000	2,000
9·2	H.E.	200	1,200	2,000	4,000	6,000
		220,200	271,700	425,000	703,000	761,000

* Included in 6-in. Howitzer.

Immediately on receipt of this statement, apparently on 19 January, 1915, G.H.Q. telegraphed to enquire whether the 18 pdr. and 4·5-in. ammunition promised for the current month would in fact be forthcoming.[1] The critical character of the situation makes it worth while to give the War Office reply (21 January) in full.

> "The estimated approximate output (not promises) for the month of January was given as 140,000 rounds 18 pdr.; and 28,000 rounds 4·5-in. Up to date (19 January) 65,000 rounds 18 pdr. have been despatched to the Lines of Communication, made up as follows:—
>
> 45,998 direct to Lines of Communication.
> 19,008 with 28th Division.
> ———
> 65,006
> ———
>
> "The Canadian Division is expected to leave at an early date and in order gradually to equip it, 4,000 rounds have been appropriated. In addition it is proposed to put aside 1,000 rounds a day towards completion of its equipment ammunition (i.e., 4,000 + 11,000 = 15,000). This leaves a balance of 60,000 rounds to complete the 140,000 estimated approximate output, and it is hoped to send 50,000 rounds to Lines of Communication by the end of January.

[1] 121/Stores/1417.

"The Army Council wish to point out that the fitting out of new formations—27th, 28th and Canadian Divisions—has seriously reduced the number of rounds available for Lines of Communication, and further that a request from you (your O.A.W.18) has now been received to carry out experiments with shrapnel and H.E. against wire entanglements, and this will occasion a further reduction.

"Ammunition for 4·5-in. Q.F. howitzer: up to date (19 January, 1915) 5,858 lyddite and 2,270 shrapnel have been sent to Lines of Communication. There will probably be a shortage of about 8,000 rounds on the estimated 28,000; but the first week in February it is hoped to send out (including ammunition with the three Batteries you have asked for) 10,000 rounds (7,000 lyddite and 3,000 shrapnel)."

True the statement communicated by the Army Council had been qualified by the explanation that it represented the amounts which contractors had undertaken to produce and that it was not to be taken as a precise and definite estimate, but no qualification can blunt the sharpness of the contrast between the hope of output thus dangled before the eyes of G.H.Q. and the actual figures of issues to France at corresponding dates.[1]

Issues of Completed Gun Ammunition to France.[2]

1915.	*March* (5 *weeks ending* 3 *April*).	*April* (4 *weeks ending* 1 *May*).	*May* (4 *weeks ending* 29 *May*).
18 pdr. S. and H.E. . .	193,762	180,396	285,642
13 pdr. ,, . .	14,500	15,560	12,600
4·5-in.	29,708	23,550	35,032
60 pdr.	14,950	10,000	16,000
4·7-in.	12,598	18,224	11,878
6-in. How.	5,573	6,446	7,000
6-in. Gun	650	200	950
9·2-in. How. . . .	1,350	1,919	1,900
	273,091	256,295	371,002

(*c*) Demand Programme.

The second type of programme—the demand programme—was that derived from the requirement factor—rounds per gun per day. A good example is found in the statement included in the memorandum which Sir John French prepared on 10 May, 1915, and sent home for the personal information of Mr. Lloyd George and other Ministers of the Crown.[3]

[1] Hist. Rec./R/1300/78.

[2] These figures include issues with units, such quantities not constituting a supply for the replenishment of exhausted reserves.

[3] *1914*, p. 239.

Table Accompanying Memorandum of 10 *May*, 1915.[1]
[*Wanted Three Months Hence, say* 1 *August.*]

Nature.	Guns now in Country.	Rounds per Gun per day.		Total Rounds required daily.*	
		Shrapnel.	H.E.	Shrapnel.	H.E.
18 pdr.	700	12	12	8,500	8,500
13 pdr.	125	12	12	1,500	1,500
15 pdr. B.L.C.	200	12	12	2,500	2,500
4·7-in. gun	80	8	8	650	650
60 pdr.	28	8	8	250	250
5-in. Howitzer	50	—	15	—	750
4·5-in. Howitzer..	130	4	16	500	2,000
6-in. Howitzer	40	—	12	—	500
9·2-in. Howitzer..	12	—	12	—	150
Total				13,900	16,800
Grand Totals { Daily					30,700
Grand Totals { Monthly					921,000

* Round numbers are given. Expansion must be provided for at a similar rate. We need more guns and a correspondingly large amount of ammunition.

This gave an aggregate requirement for August of 921,000 rounds of all natures, more than half of which was to be high explosive. The actual issues overseas during the 4 weeks ending 28 August, 1915, were 480,052 rounds of all natures, less than a third of which was of the high explosive variety. Moreover, by the date mentioned the actual number of guns in the field was almost double the number early in May upon which the estimate was based.

(*d*) The Boulogne Programme.

The full development of the demand programme is seen in a statement submitted by Sir John French to the War Office on 8 July, 1915.[2] At the Boulogne Conference on 19 June, Mr. Lloyd George had handed to General Du Cane a written question: "Given an army of 1,000,000 men what would your requirements be in guns and ammunition in order to deliver a decisive and sustained attack to enable you to break through the German lines?"[3] Accordingly, a statement was drawn up exhibiting the requirements for an army of 1,000,000 men or 54 divisions in guns, and ammunition reserves required before such an army could take the field (approximately 3,750,000 rounds) and the scale of weekly supply required, the figures working up to a total of 675,000 rounds per week. The July programme was an elaboration of these estimates. The latter programme consists of two portions—a gun programme showing the number of additional guns required month by month between June, 1915 and April, 1916, in order to secure the

[1] *1914*, p. 359.
[2] Hist. Rec./R/1000/8.
[3] Hist. Rec./R/1200/56.

proper equipment on the new scale of an army of 50 divisions by the latter date ; and secondly, an ammunition programme based upon the foregoing, in which the rounds per gun per day were gradually raised from the existing level up to the desired standard at the same time that provision was made for the supply of the rapidly increasing number of guns.

The table may be reproduced in abbreviated form :—

AMMUNITION.

Suggested weekly output month by month.

Gun.	July, 1915.		October, 1915.		January, 1916.		April, 1916.	
	Weekly output.	Rounds per gun per day.	Weekly output.	Rounds per gun per day.	Weekly output.	Rounds per gun per day.	Weekly output.	Rounds per gun per day.
13 pdr.								
Shrapnel ..	3,400	9	7,750	15	12,000	21	16,000	25
H.E. ..	3,400		7,750		12,000		16,000	
18 pdr.								
Shrapnel ..	52,000	11	75,000	17	135,000	22	170,000	20
H.E. ..	18,000		76,000		135,000		170,000	
15 pdr. B.L.C.								
Shrapnel ..	10,000	7	13,500	12	3,000	18	—	—
H.E. ..	—		3,500		9,000			
4·5-in. Howitzer								
Shrapnel ..	2,500	7	5,000	15	9,000	19	10,000	20
H.E. ..	7,500		28,000		53,000		75,000	
5-in. Howitzer.	1,700	5	4,000	12	5,000	15	5,000	15
4·7-in. Q.F.								
Shrapnel ..	2,000	7	2,000	13	—	—	—	—
H.E. ..	2,000		2,000					
60 pdr.								
Shrapnel ..	2,500	12	7,000	16	19,000	20	28,000	20
H.E. ..	2,500		7,000		19,000		28,000	
6-in. Howitzer	4,500	10	12,000	14	35,000	17	56,000	20
6-in. B.L.C.								
Shrapnel ..	175	6	300	11	400	15	400	15
H.E... ..	175		300		400		400	
8-in. Howitzer	800	7	4,000	13	8,500	15	13,000	15
9·2-in. Howitzer	1,000	7	4,000	10	7,500	12	11,000	12
12-in. Howitzer	100	4	550	7	1,500	8	1,800	8
15-in. Howitzer	100	4	100	5	100	5	200	5
TOTAL ..	114,350		259,750		464,400		600,800	

The aggregate output on this basis was to grow from 114,000 rounds per week in June, 1915, to 600,000 rounds per week in April, 1916. This programme was not that actually adopted by the War Office and Ministry of Munitions, since, among other reasons, a larger number of divisions was legislated for and provision for other theatres of war than France had to be made.

(e) MASTER-GENERAL OF THE ORDNANCE'S PROGRAMME, APRIL, 1915.

Three months before the Boulogne programme saw the light the Master-General of the Ordnance had put forward a statement which well exemplifies what we have referred to as a complete or balanced programme, which reflects simultaneously estimates of output and anticipated requirements, the former being based on contractors' promises, the latter on the scale of output—rounds per gun per day—required to meet the needs of the Army as reinforced from time to time. This, the first true supply programme, is the prototype of those which were to serve as the point of departure for the successive waves of industrial energy directed and controlled by the Ministry of Munitions on an ever-increasing scale and with a steadily gathering momentum. The elaboration of this most pregnant statement was due to instructions received from the Cabinet Committee on Munitions of War, known as the "Treasury Committee," a body appointed by Mr. Asquith to take in hand the examination of the difficult position which had arisen. Mr. Lloyd George was chairman, a position to which he had established his claim by his indefatigable insistence on the need for wider views and a maximum policy in munition matters. A chief obstacle to the effectiveness of such criticism had been the secrecy with which the plans of the War Office were enshrouded, a secrecy based primarily upon military considerations, but rendered increasingly baffling by the technical character of the data. Since, then, it was essential, before the significance of the manufacturing problem could be fully comprehended, to examine the statistical basis or programme, it was decided at the first meeting of the Committee which was held on 12 April, 1915, that the Committee's initial task was to ascertain the position in regard to the supply of the more important types of artillery and ammunition. The Master-General of the Ordnance, who was a member of the Committee, undertook to prepare statements showing, in respect of the 18 pdr. and other important guns, the number that would be required and the numbers expected to be delivered under existing arrangements; with corresponding figures for the output of ammunition anticipated at the end of April, and subsequent months.[1]

The result is illustrated in the tables which follow.[2] The basis of the estimate appears to have been the assumption that a new army would join the Expeditionary Force every month from May to August

---

[1] Minutes of First Meeting M.C.1. HIST. REC./R/172/1.

[2] HIST. REC./R/172/7. The statement contained similar tables for the 4·7-in. 60 pdr., 6-in. howitzer, 8-in. howitzer, 9·2-in. howitzer and 12-in. howitzer.

inclusive. The Estimates were prefaced by a cautionary statement to the effect that "the estimates of deliveries are the best available but no responsibility for their ultimate correctness can be taken."

18 pdr.

	1 April.	1 May.	1 June.	1 July.	1 Aug.
1. Number of guns required ..	625	913	1,201	1,489	1,777
2. Number of guns expected to be ready.	990	1,100	1,225	1,525	2,000*
3. Number of rounds per week at 17 per gun per day required for guns as at 2.	74,375	108,587	142,800	177,291	211,463
4. Rounds expected per week—					
(*a*) From Home	38,750	51,250	62,500	65,000	75,000
(*b*) From Abroad	26,250	38,750	57,500	85,000	140,000
5. Rounds per week promised by contractors when orders were placed.	271,000	271,000	271,000	393,000	420,000

* 2,600 promised.

Each army will require at least one month's supply at 20 rounds a gun a day equipment before going into the Field.

4·5-in. Howitzer.

	1 April	1 May.	1 June.	1 July.	1 Aug.
1. Number of armies	2	3	4	5	6
2. Number of guns required.. ..	116	212	308	404	500
3. Number of guns expected to be ready.	186	208	268	360	450
4. Number of rounds per week at 17 per gun per day required for guns as at 2.	13,800	25,600	36,600	48,000	59,500
5. Rounds expected per week—					
(*a*) Home	8,000	10,000	14,000	16,000	16,000
(*b*) Abroad	—	2,000	4,000	8,000	10,000
6. Rounds per week promised by contractors when orders were placed.	18,000	20,000	38,000	48,000	48,000

There is considerable difficulty in getting the particular size of cordite required for this gun.

The salient features of this programme so far as ammunition is concerned, may be brought out by examining its validity in the light of subsequent experience. We may take the figures for the month of August, 1915, and compare the programme figures with the output actually obtained.

Weekly Ammunition Output in August, 1915. *Actual output realised as compared with forecast contained in the Master-General of the Ordnance's Programme dated* 13 *April,* 1915. (*Principal Natures Only.*)

	Contractors' Promises.	*War Office Anticipation.*	*Require-ments.*	*Actual Issues.*[1]
18 pdr.	420,000	215,000	211,463	108,000
4·5 in. howitzer ..	48,000	26,000	59,500	14,600
4·7-in.	8,400	8,000	6,020	1,600
60 pdr.	8,000	7,500	11,900	1,825
6-in. howitzer ..	14,000	4,000	2,240	2,333
8-in. howitzer ..	2,000	1,800	840	735
9·2-in. howitzer ..	3,200	1,600	1,120	492
	503,600	263,900	293,083	129,585

This concise statement contains the essence of the munitions problem as it was in the summer of 1915. It will be noticed that the War Office anticipation, to the correctness of which they explicitly refused to be committed, discounted contractors' promises approximately 50 per cent. The actual output, however, was only approximately half this reduced figure.

(*f*) The First Ministry of Munitions Programme, July, 1915.

This survey may be fitly concluded by a summary of the earliest gun and ammunition programme formulated by the Ministry of Munitions. This will exhibit the essential continuity of the future series of such programmes with those which had already been developed. It may also serve to bridge the transition between the period of War Office responsibility and that of the Ministry of Munitions.

As already explained, the basis of this programme is to be found in the Du Cane statement of requirements for heavy guns and ammunition, as expanded by the War Office from a 50 to a 70 division scale. In the tables given below the figures of the original programme have been supplemented so as to show the quantities due from contractors after the further orders contemplated by the Ministry had been placed; the actual output as measured by issues overseas has also been set against the requirements, in order to exhibit the final outcome of these efforts during the period ending with midsummer, 1916.

The statement of the programme may be prefaced by some comments which will elucidate the character of the demands entailed thereby. Thus in the matter of guns the War Office had asked for an additional output by March, 1916, in excess of numbers already ordered, of 641 60 pdrs., 458 6-in. howitzers, 300 8-in. or 9·2-in. howitzers and 16 12-in. howitzers.

Enquiries showed that such an achievement was impossible by the date named.[2] The fresh output implied that creation of capacity as its prior condition and new buildings equipped with fresh plant and

[1] Average weekly issues overseas of completed ammunition during 4 weeks to 28 August, 1915.

[2] Hist. Rec./R/1000/57.

machinery must be provided before productive work could begin. It was also necessary, as bitter experience had proved, to discount the promises or sanguine estimates of the manufacturer based upon this development of productive capacity. After a critical review of the situation the Gun Department on 23 July, 1915, put forward the following tentative estimate showing the dates when the additional guns would be forthcoming.

	March, 1916.	June, 1916.
60 pdr.	339	519
6-in. how.	198	362
8-in. or 9·2-in.	120	184
12-in. or 15-in.	60	60

The figures finally accepted as the basis of the gun and ammunition programme " B " receded still further. They were as follows :—

Anticipated output of Guns after 30 *June*, 1915.

End of	Sept., 1915	Dec., 1915.	March, 1916.	June, 1916.
60 pdr.	49	139	271	451
6-in. how.	8	32	112	276
8-in. or 9·2-in.	14	37	78	148
12-in. or 15-in.	16	32	47	47

Thus the anticipated deficits at the end of March, 1916, the crucial date when supplies for the new campaign would be required to be ready in the field, would be 370 60 pdrs., 346 6-in. howitzers, 222 8-in. or 9·2-in. howitzers. There would be a surplus of 12-in. howitzers. These figures assumed moreover that all outstanding War Office orders would be punctually executed.

Additional light field guns and howitzers were also required, but these it was expected would be supplied, if not by March, 1916, at all events by June. The full list of principal types, the expected output and the actual deliveries attained by March, 1916, were as follows :—

Gun Programme " B " (July, 1915)*: Position in March,* 1916.

	Outstanding on War Office Orders.	*Additional Deliveries expected.*	*Actual Deliveries.*
18 pdr.	2,826	2,680	2,507
13 pdr.	218	130	28
4·5-in.	611	667	700
60 pdr.	115	271	250
6-in. how.	16	112	45
8-in. how.	8	28	1
9·2-in. how.	30	50	44
12-in. how.	27	47	27
15-in. how.	—	—	1
Total	3,851	3,985	3,603

Thus in the case of the heavier natures the programme fell seriously short of realisation at this date.

The 1915 shell and ammunition programme gave the requirements that would have to be satisfied if the anticipated number of guns were forthcoming, these requirements being based as usual upon the accepted ration or allowance per gun per day.

The results of the programme are shown in detail in the appended statement which gives the position in March, 1916.

Completed Ammunition. It will be seen that in the case of light ammunition the output had attained only 57 per cent. of the requirements figure in March, 1916. By June, however, output was actually in excess of requirements for this group of natures, thanks to the outpouring of the belated deliveries of 18 pdr. shrapnel and H.E. from Canada and the United States which came to hand in great abundance at this time. In heavy natures which were now of primary importance the deliveries reached only 27 per cent. of the requirements in March, 1915, rising to 55 per cent. in June. This improvement was due to the fact that the new filling factories established by Mr. Lloyd George came into full bearing in this quarter.

Shell Manufacture.—Turning next to the recorded weekly output of shell in comparison with contract promises it will be seen that home contractors show a progressive improvement in attainment, reaching 42, 52, 74, and 81 per cent. respectively, in September, 1915, December, 1915, March, 1916, and June, 1916. Contract promises had, however, long since been realised to be useless as the basis of a military programme and departmental estimates of anticipated output had been substituted. How much nearer these estimates approached the actual results obtained inspection of the tables will show.

In the case of deliveries from abroad the task of forecasting actual receipts was more baffling than in the case of British supplies, though in view of the great importance which this output from Canada and the United States had already attained it was vital that the best estimates possible should be secured. The results as shown prove that the revised expectations realised a fair degree of accuracy even in this case, though in the last period shown, owing to the influence of the factor already referred to—the late delivery of accumulated arrears—the deliveries actually exceeded expectations.

This table also exhibits the relation between the orders placed by the War Office and the total realised output under the administration of the Ministry of Munitions. It will be noticed that the former totals were not surpassed before the first quarter of 1916.

Finally, a comparison should be made between the volume of orders given and the requirements as laid down. It was an obvious corollary from the fact that contract performances were in the aggregate uniformly behind promises that the ordering of *excess* quantities should be adopted. The War Office shell orders were nearly double the required quantity of ammunition (184 per cent. for September deliveries). The augmented Ministry of Munitions orders for shell were equivalent to more than twice the quantity of finished ammunition required.

First Ministry of Munitions Gun and Ammunition Programme (July, 1915).

Summary of Position in March, 1916.

Calibre.	Guns.	Guns, Additional Output.				Completed Ammunition (Weekly).		Shell Manufacture (Weekly).				
	Stock on 30.6.15[1]	Outstanding on War Office Orders[2]	Expected (July 1915) Programme B.[3]	Delivered.[4]		Required (5.10.15)[5]	Issued.[6]		Due from Contractors, War Office Orders.[7]	Due from Contractors, Total.[8]	Anticipated Deliveries.[9]	Actual Deliveries.[10]
Light.												
18 pdr.	1,700	2,826	2,680	2,507	H.E	233,400	98,012	Home	138,500	383,400	309,400	331,374
								Abroad	289,500	356,000	334,000	276,202
					S.	233,400	202,322	Home	94,000	127,500	104,000	104,126
								Abroad	295,000	451,500	288,000	336,805
13 pdr.	114	218	130	28	H.E	12,950	4,454	Home	1,000	50,250	17,400	22,633
								Abroad	7,500	10,000	8,500	8,468
					S.	12,950	7,579	Home	6,940	17,500	15,000	11,277
								Abroad	1,250	7,150	1,000	218
4·5-in.	334	611	667	700	H.E	135,000	58,673	Home	22,900	135,200	68,600	74,920
								Abroad	103,050	181,500	101,500	94,364
					S.	5,000	4,381	Home	7,900	6,850	6,500	4,779
								Abroad	—	—	—	—
5-in.	80	—	—	—	H.E	8,400	1,277	Home	—	—	—	—
								Abroad	1,900	24,000	10,000	16,935
60 pdr.	68	115	271	250	H.E	23,100	7,656	Home	3,450	15,400	10,450	11,655
								Abroad	14,000	25,000	2,000	1,788
					S.	23,100	2,889	Home	3,260	17,600	6,400	9,235
								Abroad	—	—	—	—
4·7-in.	88	—	—	—	H. E	4,620	3,703	Home	5,350	3,100	2,550	3,170
								Abroad	1,800	6,950	4,200	3,106
					S.	4,620	877	Home	500	2,500	1,300	1,147
								Abroad	400	1,385	100	2,594
Total (light)	2,384	3,770	3,748	3,485	H.E	417,400	173,775	Home	171,200	587,350	408,400	443,752
								Abroad	417,750	603,450	460,200	400,863
					S.	279,000	217,048	Home	112,600	161,950	133,200	130,564
								Abroad	296,650	460,035	289,100	339,617
Heavy.												
6-in. Howitzer	86	16	112	45	H.E	39,200	9,000	Home	9,800	39,750	13,700	12,593
								Abroad	7,800	82,970	12,700	10,180
8-in. Howitzer	24	8	28	1	H.E	11,200	3,753	Home	3,500	9,100	5,070	4,500
								Abroad	900	33,800	1,900	1,707
9·2-in. Howitzer	18	30	50	44	H.E	6,300	2,689	Home	2,930	3,350	2,700	2,746
								Abroad	1,000	23,560	1,480	1,382
12-in. Howitzer	1	27	47	27	H.E	2,450	361	Home	1,200	1,270	670	740
								Abroad	400	2,650	450	124
15-in. Howitzer	4	—	—	1	H.E	420	60	Home		195	120	107
								Abroad	—	350	100	119
Total (heavy)	133	81	237	118	H.E	59,570	15,863	Home	17,430	53,665	22,260	20,686
								Abroad	10,100	143,330	16,630	13.512
Grand Total	2,517	3,851	3,985	3,603	H.E	476,970	189,638	H.E	616,480	1,387,795	907,410	815,813
					S.	279,000	217,048	S.	409,250	621,985	422,300	470,181

[1] Hist. Rec./R/1000/123/1.
[2] Hist. Rec./H/1200/14.
[3] Hist. Rec./R/1000/123/2.
[4] Hist. Rec./R/1000.1/3.
[5] Hist. Rec./R/1000/123/4.
[6] Hist. Rec./R/1300/49.
[7] Hist. Rec./R/1000/123/5.
[8] Hist. Rec./R/1000/123/6.
[9] *Ibid.*
[10] *Ibid.*

CHAPTER II.

THE MACHINERY OF SUPPLY.

I. Organisation existing at the Outbreak of War.

Before reviewing the steps taken by the War Office to secure the supplies required by the Army, it is desirable to understand the administrative organisation at the War Office for dealing with these matters and its development during the first year of the war.

The organisation of the War Office, in June, 1914, in its main outline, dated from the Esher Committee, appointed in 1903. On the recommendation of that Committee the War Office was reorganised and an Army Council was constituted by Letters Patent,[1] consisting of the Secretary of State, six other members, and a Secretary. The four Military Members were : the Chief of the Imperial General Staff, the Adjutant-General, the Quartermaster-General, and the Master-General of the Ordnance. The Civil Member was the Parliamentary Under Secretary for State. The Finance Member replaced the former Financial Secretary. The Secretary to the War Office was also the Secretary to the Army Council. All existing duties within the War Office were distributed among these seven members of the Council ; but the Directorate of Military Aeronautics, created in September, 1913, was made immediately responsible to the Secretary of State.

The actual composition of the Army Council at the beginning of the war was as follows :—

Secretary of State for War ..	Earl Kitchener.
Chief of the Imperial General Staff.	General Sir C. W. H. Douglas, G.C.B. (First Military Member).
Adjutant-General to the Forces.	Lt.-General Sir H. C. Sclater, K.C.B. (Second Military Member).
Quartermaster-General to the Forces.	Major-General Sir J. S. Cowans, K.C.B. (Third Military Member)
Master-General of the Ordnance.	Major-General Sir S. B. von Donop, K.C.B. (Fourth Military Member).
Parliamentary Under Secretary of State.	Mr. H. J. Tennant, M.P. (Civil Member).
Financial Secretary	Mr. H. T. Baker, M.P. (Finance Member).
Appointed 18.12.14	Sir G. S. Gibb (Additional Civil Member (Temporary) for Armament Contracts).
	Secretary.
Sir R. H. Brade, K.C.B. ..	(Secretary of the War Office).

[1] 6 February, 1904.

The members of the Council principally concerned with supply in its various aspects were the Quartermaster-General, the Master-General of the Ordnance and the Finance Member. The respective spheres of these three may be briefly indicated.

(*a*) DEPARTMENT OF THE QUARTERMASTER-GENERAL.

The third Military Member, the Quartermaster-General, shared with the Master-General of the Ordnance, the chief responsibility for providing supplies required by the Army, the province of the latter being confined, in the main, to artillery supplies and technical munitions. The Quartermaster-General was responsible for the administration of sea and road transport; for Remount, Veterinary, Ordnance, Supply and Barrack Services; for the organisation, administration and training of personnel employed in these services; for the custody and issue of all military stores including those provided by the Master-General of the Ordnance; for reserves and mobilisation stores. In particular, the Director of Equipment and Ordnance Stores was responsible for clothing and personal equipment and certain technical supplies not falling within the province of the Master-General of the Ordnance, together with the preparation of mobilisation store tables.

(*b*) DEPARTMENT OF THE MASTER-GENERAL OF THE ORDNANCE.

The duties of the Master-General of the Ordnance were primarily concerned with armaments and fortifications; with the determination of scales of reserves of arms and ammunition; with patents and inventions; with patterns, provision and inspection of guns, small arms, ammunition, R.A. and R.E. technical stores and vehicles; with technical committees on war *matériel*, with the administration of Royal Ordnance Factories. In addition the Master-General was responsible for the construction and maintenance of fortifications and works, and for the administration of the Ordnance College. The principal branches of this department were the Directorate of Artillery, the Directorate of Fortifications and Works, and the Directorate of Barrack Construction.

At the outbreak of war the work of the Director of Artillery, Brig.-General H. Guthrie Smith, was divided between four sections known as A1, A2, A3 and A4. *A*1 dealt with fixed armaments and naval ordnance and all questions relating to coast defence. *A*2 was the branch to which fell the responsibility for the most onerous and anxious section of supply. It dealt with field armaments, both horse, field, heavy siege and mountain equipments; with movable armaments (other than machine guns); with patterns, estimates, manufacture and inspection of these stores, and with all technical questions relating thereto.

*A*3 dealt with small arms and vehicles, and with equipments, patterns, manufacture and provision of the same; with explosives (other than artillery ammunition), with optical instruments (other than those special to artillery), and with bicycles. In November, 1914, this branch was divided and an additional section *A*5 was created to deal exclusively with ·303 in. rifles and small arms ammunition.

*A*4 dealt with questions of personnel in the departments for which the Director of Artillery was responsible ; with questions relating to patents and inventions ; with correspondence relating to the administration of the Ordnance Factories, the Inspection Department, the Experimental Establishments, the Ordnance College and Artillery Institution.

*A*6 was created on 1 January, 1915, to supervise the supply of high explosives and ingredients in conjunction with Lord Moulton's Committee on the Supply of High Explosives.

*A*7 was established in April, 1915, by the transfer to the Director of Artillery of the branch known as Contracts I.A which had previously been responsible under the Director of Army Contracts for all contract business relating to warlike stores.

The total personnel of these various sections only amounted to some 52 persons.

The Ordnance Board, Woolwich, under the Master-General of the Ordnance, was a body of expert artillerists whose duty was to direct research work in connection with the introduction or development of guns, ammunition and explosives and similar questions referred to them by the Admiralty or War Office (Chairman, Major-General Sir Charles F. Hadden, K.C.B.).

The Small Arms Committee, under the Master-General of the Ordnance, undertook similar research and experimental work in connection with small arms and ammunition.

Royal Ordnance Factories.—The Ordnance Factories at Woolwich, Waltham Abbey, and Enfield Lock were under the general superintendence of a Chief Superintendent of Ordnance Factories (Sir H. Frederick Donaldson, K.C.B.). These Factories included the Royal Laboratory, Woolwich Arsenal, the Royal Gun and Carriage Factories, Woolwich Arsenal, the Royal Gunpowder Factory, Waltham Abbey and the Royal Small Arms Factory at Enfield Lock, besides a Building Works Department, a Mechanical Engineering Department, and a Medical Department, all at Woolwich.

The Deputy Director of Ordnance Stores (D.D.O.S.), responsible to the Quartermaster-General, was also located in Woolwich Arsenal. He dealt with the receipt and issue of warlike stores.

The Chief Inspector, Woolwich (C.I.W.), and his staff were at the Royal Arsenal, Woolwich. He was responsible to the Master-General of the Ordnance for seeing that supplies satisfied all prescribed tests.

The Superintendent of Experiments at Shoeburyness was under the Master-General of the Ordnance. Artillery and ammunition tests were carried out on these ranges.

The *Research Department,* Woolwich, was also under the Master-General of the Ordnance and contained laboratories where chemical and mechanical research work was carried on.

(*c*) Department of the Finance Member.

The Finance Member acted as Financial Secretary to the War Office, assisted by an Assistant Financial Secretary and a Director of Army

Contracts as his principal officers. On the recommendation of the Esher Committee, a Director-General of Army Finance had been appointed in 1904, assisted by two Directors, one for Financial Services, the other for Army Accounts. But the office of Director-General of Army Finance was replaced in 1909 by that of the Assistant Financial Secretary. In the same year the Contracts Department was separated from the Finance Branch, and the Director of Contracts became immediately responsible to the Finance Member as regards discipline and general policy, though no order could be placed without the concurrence of the Military Branch concerned. A small Finance Branch for estimates and financial advice was administered through the Director of Financial Services. A considerable part of the duties of the old Finance Department was amalgamated with those of the old Army Pay Department, and the whole entrusted to a new civil branch, called the Army Accounts Department, administered through the Director of Army Accounts. A Finance Section, known as M.G.O.F., under Mr. (later Sir Sigmund) Dannreuther was attached to the Department of the Master-General of the Ordnance and served as a link between the administration of armament supply and the higher financial authority. This branch became responsible for granting or securing approval for expenditure on munitions, for accountancy and for general financial supervision of contracts placed. By the beginning of December, 1914, the Contracts Department's operations had assumed a scale which was thought to require the whole attention of a Member of the Army Council. Accordingly, Sir George Gibb was appointed an additional member of the Army Council, and assumed responsibility for the Contracts Branch which was thus removed from the control of the Finance Member.[1]

II. The Duties of the Director of Army Contracts.

The Contracts Branch of the War Office was created during the Crimean War, the first Director being appointed in June, 1855. It was then laid down that all stores required for all the departments of the Army should be purchased by the Contracts Branch, and that the normal method of making contracts should be by public competition. Special authority was required for departing from this procedure.

In the early history of the branch, an excessive use was made of brokers and middlemen, and much of the work was carried on on old-fashioned lines. These methods, however, were gradually discarded and the procedure modernised under the third Director (Sir Evan Nepean) 1877–1891.

So far the purchases for all the departments of the Army had been centralised in the Contracts Branch ; this principle of centralisation has, however, been questioned twice recently, the second time with a temporary success. The first occasion was in 1901, when a Committee (Sir Clinton Dawkin's) was appointed to enquire into War Office

[1] See below, p. 71.

organisation. The third paragraph of the terms of reference directed the Committee to report :—

> " Whether the Office of the Director of Contracts should deal with all the business now transacted there, or whether the making of contracts could be, in whole or part, transferred to the Military Districts or to the Military Departments of the War Office."

After taking evidence not only from the military officers and officials of the War Office, but from representatives of railway companies and other large companies, as to the method of purchasing employed by them, the Committee reported in favour of the retention of a Central Purchasing Branch. They criticised, however, the existing relations between the supply departments and the Contracts Branch, and suggested a number of changes, many of which were adopted.

Not long afterwards, however (in February, 1904), the general principle of centralisation was again called into question by Lord Esher's War Office (Reconstitution) Committee, and this time it was discarded in favour of a new system, as defined in the following paragraph :—

> " Each Military member of Council will administer a specific vote or votes of the Army estimates, and each branch will be provided with a civil finance section charged with the work of accounting and of furnishing such financial advice as the member may require. The two great providing branches under the third and fourth Military members will each be equipped with a contract or buying section whose head may be civil or military. All contracts above a certain amount will be independently registered and reviewed by the Financial Secretary."

This new system did not, however, work well in practice. It resulted in competition in the same markets by the sections dealing with contracts for the different directorates, and in other ways as well, the absence of a single purchasing authority led to difficulties. The Army Council, therefore, decided in 1907 to re-establish the post of Director of Army Contracts, and to combine the various sections performing contract duties into a directorate under the Financial Secretary. In 1913, however, the purchase of aeroplanes and aeronautical stores, as being highly technical and to a large extent experimental in character, was transferred from the Director of Army Contracts to the Director-General of Military Aeronautics.[1]

The normal administrative procedure in regard to army contracts is clearly indicated in the instructions formulated for the guidance of the Director when the Department of Army Contracts was reconstituted in 1907,[2] extracts from which may be here reproduced.

> " The Director of Contracts will, in concert with the Directors administering Votes, be responsible for contracts made at the War Office for the purchase and sale of supplies, stores, machinery, clothing, and for other services required for the Army, including

---

[1] The above sketch is taken from a Memorandum on War Office Contracts by Mr. U. F. Wintour, February, 1916. (Hist. Rec./R/170/25).

[2] War Office Notice 541 (29 November, 1907).

the erection and maintenance of works. He will also, in concert with the Directors concerned, deal with labour and wages questions arising on Army contracts. He will report upon the cost of production in the manufacturing departments as compared with purchase from the trade, and upon proposals for the allocation of orders, and will be present at allocation meetings."

"*The List of Contractors.*—In order to secure the satisfactory quality of supplies, and the due observance of the House of Commons' resolution in regard to fair wages and sub-letting, and to safeguard the public from possible loss arising from a contractor's failure to carry out his covenants, care will be taken to place orders only with persons or firms of good reputation, not necessarily to the exclusion of those in a small way of business. Transactions with agents and middlemen will be avoided as far as possible, and orders for manufactured articles limited to actual manufacturers."

"Applications from persons or firms desirous of being placed on the lists of those eligible to compete for contracts will be carefully considered. If satisfactory evidence is obtained that their means of production are sufficient, and that their reputation, both financially and for quality of manufacture, and as employers of labour is good, the request should be granted, after reference to the Director administering the Vote, but as a rule they should only be entrusted with small trial orders in the first instance."

"Before firms are placed on the list their works should, as a rule, be inspected. When inspection by an officer of a technical department is necessary the Director concerned will be asked to arrange accordingly."

"*Requisition upon Contract Department.*—Requisitions for purchase will be accompanied by full particulars as to pattern, make, descriptions and quality of the articles demanded, and where patterns, specifications or drawings exist they will either be attached or will be referred to by identification numbers. When the article is of a new design or special character, carefully prepared specifications and such drawings as may be necessary will be furnished for the guidance of manufacturers."

"The responsibility for pattern, specification and nomenclature of stores rests with the Director administering the Vote. It will, however, be open to the Director of Contracts to bring to notice any case in which a pattern or specification appears to be of such a standard as to be impossible of fulfilment without great additional cost."

"*Tenders.*—All tenders will be addressed in sealed covers to the Director of Contracts, and placed in the tender box provided for the purpose at or before the hour indicated in the invitation, after which time no tender will be received, except in special circumstances. One key of the tender box will be kept in the custody of the Principal of the Contract Department and the other by some responsible official of another department.

"At the appointed hour, the tender box will be unlocked in the presence of the principal (or other authorised officer). All tenders due on that day will be opened and the numbers of those received, and the names of the firms tendering, will be recorded then and there, and initialed by the officers present. Tenders (and acceptances) are to be treated as strictly confidential."

"The tenders will afterwards be tabulated and considered. The basis of consideration should be the most favourable prices; but attention should be paid to the record and character of the firms tendering, their competence to perform orders satisfactorily and punctually, the necessity for maintaining or widening the area of supply and any other special circumstance which may affect the case."

"The Director of Contracts will use his discretion in submitting for higher sanction the acceptance of a contract, always remembering that the established principle of public purchase is competition and the acceptance of the lowest offer, and that good reasons are necessary to justify a departure from this rule."

"Purchases by single tender, by direct negotiation on an emergency, or by broker, will be reported to higher authority, if over £200 in amount."

"*Execution of Contracts.*—All questions as to deliveries under a contract or as to time of delivery will be dealt with, in the first instance, by the receiving department concerned, but any proposal which involves a change in the pattern or specification governing the contract or any departure from the terms of the contract, will be referred to the Director of Contracts, who will conduct any further correspondence on the subject, and if necessary, obtain such higher War Office or Treasury authority as may be prescribed.

"The receiving department will correspond direct with firms in regard to the quantity, quality and punctuality of their deliveries and generally on all questions of detail (not involving changes in pattern) that may arise during the execution of a contract.

"If the receiving department should find serious difficulty in securing the satisfactory fulfilment of a contract, full particulars will be given to the Director of Contracts, who will then take such action as he may deem desirable to secure delivery and more satisfactory results in future.

"In the event of failure to complete a contract on the proper dates, a report will be made to the Contracts Department, and special returns as to progress on contracts will be prepared from time to time, as may be arranged."

"It will be open to Directors administering Votes to consider a contract completed if there should be short deliveries not exceeding 5 per cent. in quantity, or to accept surplus deliveries within the same limit, notifying their action to the Contracts Department. Any case in which these limits are exceeded will be referred to the Contracts Department for concurrence in the proposed action. If the limits are seriously exceeded, the approval of the Financial Secretary will be obtained."

III. Normal Contract Procedure.[1]

(*a*) Contracts Demands.

The size of the Army being determined by Parliament, and the scale of equipment being approved, the formulation of definite requirements was a straight-forward matter. It was the duty of the Master-General of the Ordnance and his officers to prescribe what equipments should be supplied and the duty of the Contracts Department was limited to procuring from the armament firms such portions as might be definitely requisitioned. In the case of gun ammunition, for example, the Master-General of the Ordnance, through the Director of Artillery, was the approval authority and the supply authority. Two sources of supply were available, the Ordnance Factories, which were under the direct control of the Master-General of the Ordnance, and trade contractors, with whom the Contracts Department placed orders subject to the Master-General of the Ordnance's approval. Thus the responsibility of the Contracts Department commenced with the receipt of a "Contracts Demand" or instruction to place contracts for a specified quantity.

(*b*) System of Tendering.

Having received a contracts demand, it was the duty of the Contracts Department to issue tenders, the normal system of buying for Government in peace time being by means of a system of competitive tender, confined in general to a limited number of approved suppliers.

The rules laid down for the regulation of competitive tendering required :—[2]

(*a*) That purchases should as a general rule be made by competitive tendering and not by private treaty ;

(*b*) that all tenders should be delivered at a certain place by a given hour ;

(*c*) that if requirements were modified after the receipt of tenders all firms should be given an equal chance of amending their offers.

These rules were designed to secure absolute fairness as between rival firms, and to avoid the suspicion of anything like favouritism or collusion. In normal times, reasonable prices were secured by the competition of several firms for a limited order which all were anxious to obtain, and the allocation of orders could usually be readily made on the basis of the lowest offers which were satisfactory as regards delivery.

The defects of the method of purchase by tender when applied to the wholesale requirements of war time were formulated with lucidity by Mr. U. F. Wintour after 18 months' experience as head of the Army Contracts Department. Though these criticisms have reference primarily to non-munition supplies, such as barbed wire,

---

[1] Based on History of P.M.3, by Mr. C. Burrage, July 1917. (Hist. Rec. H./500/10) ; Memorandum on the Contracts Branch and its Functions, by Mr. U. F. Wintour, November 1914. (Hist. Rec./R/500/64).

[2] Memorandum on War Office Contracts, by Mr. U. F. Wintour, February, 1916. (Hist. Rec./R/170/25).

textile or leather goods, they are equally applicable to armament supplies and may therefore be reproduced here.[1]

" 1. Where all or most offers have to be accepted there is no effective competition to keep prices down to a reasonable level.

" 2. As the demands of the War Office are not only large but in nearly every case extremely urgent, there is no possibility of adopting the waiting policy of refusing high tenders in the hope that disappointed firms will reduce their prices at the next invitation to tender.

" 3. The principle of inviting offers from all manufacturers at the same moment has several vicious consequences. In the first place it means that the total requirements of the War Office are known to everyone in the trade, and the relation of such demand to the probable supply can therefore be pretty accurately gauged by all concerned.

" 4. Attempts have been made to remove this objection (*a*) by inviting tenders for a smaller quantity than that actually required, or (*b*) by asking for all that firms can offer by a certain date. But the result of (*a*) is that firms often do not quote for their full possible production, and the impression conveyed by (*b*) is that the total demands of the War Office are probably even greater than the maximum output of the industry within the time stated. Neither of these alternative methods is, therefore, satisfactory.

" 5. The second consequence is that all firms able to tender go into the market at the same time for the raw materials or partly manufactured goods that they will require if they get the order. The inevitable result is that the net demand is multiplied several times over in the market for raw materials or for semi-manufactured goods such as yarn, cloth, etc. Where 20 firms may eventually receive orders for say 2,000 tons weight of goods, 200 firms or more will have been obtaining options for 20,000 tons of raw material, yarn or cloth. This causes complete chaos in the market for these goods, and the competition for options forces the price up to a quite fictitious and unwarranted level.

" 6. Further disadvantages incidental to the tendering system at a time of pressure are due to the inevitable delays involved in dealing with a numerous list of offers all at the same time. First there is the scheduling of the offers in the prescribed form. Where there are two hundred or more firms quoting, this alone may occupy twenty-four hours. It is then necessary to refer the scheduled offers to Pimlico or through the military branch of the War Office, to Woolwich, for reports on the samples submitted by the firms, and recommendations as to the allocation of orders on the basis of the deliveries offered. Delay frequently occurs because firms have not submitted samples at the time the tender was sent in. At other times, owing to insufficient marking or labels being torn off, samples go astray, and further samples have to be obtained.

[1] Memorandum on War Office Contracts, by Mr. U. F. Wintour, February, 1916. (HIST. REC./R/170/25).

The result is that a period of ten days or a fortnight normally lapses before a large tender is returned to the Contracts Branch for the acceptances to be made out. In the meantime, owing to the fluctuations of the market, firms will be compelled to withdraw their offers owing to their options having expired. They will then be asked to renew their offers, and further samples will require to be submitted. In many cases manufacturers are dependent on an uncertain source of supply, and can only offer subject to immediate acceptance, and tenders are often sent in headed by the words 'without engagement.' Such offers cannot properly be dealt with by the usual routine of the tendering system.

"7. The tendering system in normal times is generally based on the supposition that all firms are quoting for the same article and to the same specification. Where this is the case the allocation of orders according to the price and rate of delivery offered is simple and fair.

"During the war, however, the standard specifications drawn up in times of peace are continually being departed from, owing to the necessity of taking reasonable substitutes to secure the quantities required in a short time. Trade patterns are more and more taking the place of regulation patterns, and great difficulty is found in revising specifications so as to make them both sufficiently wide and sufficiently definite. When tenders are received for a great variety of patterns for one or more articles, there is no real competition between the tendering firms, and the allocation of orders according to price—which is a single and satisfactory method in times of peace—no longer necessarily secures that the Department gets the best value for its money.

"8. Competitive tendering may have an adverse effect on the prices, not only by setting up undue competition for a limited supply of raw material, but by encouraging undue competition for a limited supply of labour in the same industry. Competition for labour leads to increased wages, just as competition for raw material leads to higher market prices. In both cases the increase in the cost of manufacture is reflected in the price quoted on the tendering."

(*c*) Delivery and Inspection.

The duty of receiving deliveries was not part of the work of the Contracts Department. Each contract specified the receiving officer to whom stores were to be delivered, usually the Deputy Director of Ordnance Stores, Royal Arsenal, Woolwich, to whom, for example, all consignments of gun ammunition or components would be made. Delivery, however, did not imply acceptance, since the articles had to be submitted to an inspection test to show whether they were as required, "of the qualities and sorts described, and equal in all respects to the patterns, specifications, drawings and samples specified."[1] It was laid down that "the articles before being received into store shall be examined, and if found inferior in quality to or differing in form or material from the patterns, specifications, drawings or samples specified

[1] Conditions of Contract (Army Form K. 1271.) See Appendix I.

in the schedule, may be rejected. Such rejected articles shall not be considered as having been delivered under the contract, but the contractor shall, if required to do so by the Secretary of State for War, replace the same at his own expense, without any allowance being made to him." The Chief Inspector, Royal Arsenal, Woolwich, was the principal of the inspection authorities. In the case of a shell contract, for example, the contractor was dependent upon him for all technical information to guide manufacture, usually contained in a drawing and specification, and naturally turned to him on matters of technical difficulty. The Chief Inspector was, however, not in a position to sanction any relaxation of the conditions or tests without reference to the military branch, which was in turn advised, where necessary, by the body of experts known as the Ordnance Board and by the Superintendent of Research. If the work of inspection was in arrears, or if any doubtful question arose, the interval between delivery to the Deputy Director of Ordnance Stores and acceptance by the Chief Inspector, Woolwich, was likely to be considerable, and the contractor might in such circumstances be seriously hampered. His situation was not made easier by the fact that the Contracts Department, with whom he normally corresponded, could exercise no control over the receiving officer or the inspecting officer.

(*d*) Penalties for Delay.

Under the standard conditions of contract applied to War Office purchases of stores and materials the contractor was liable to penalties in respect of overdue deliveries.

"(*a*) *Damages for Delay.*—Should the articles or any portion thereof not be delivered within the period or periods stipulated in the schedule, whether by reason of the exercise by the Secretary of State for War of his power of rejection under Clause 2 or otherwise, the contractor shall be liable by way of liquidated damages for delay for a sum equal to 1 per cent. on the value of the articles deficient if the delay does not exceed thirty days, for 2 per cent. if the delay exceeds thirty days but does not exceed sixty days, and for 3 per cent. if the delay exceeds sixty days; such sum may at any time be deducted from any sum or sums then due, or which at any time thereafter may become due to him under this or any other contract with this Department, or may be demanded of him to be paid within fourteen days to the Paymaster-General for credit to Army Funds.

"(*b*) *Purchase in Default.*—In addition to the above, if and whenever there may be any articles or any portion thereof deficient, the Secretary of State for War shall be at liberty to purchase other articles of the same or similar description from other persons to supply such deficiency; and in the event of any excess cost being incurred by reason of any difference between the price paid for the same and the contract price, to charge the amount of such excess cost to the contractor, and the sum so charged shall, at the option of the Secretary of State for War, be deducted and paid in like manner as the liquidated damages hereinbefore mentioned.

" (*c*) *Termination of Contract.*—The Secretary of State for War shall also be at liberty to terminate the contract at, or after, any one of the specified periods at which default shall have been made, either wholly or to the extent of such default, without prejudice to his remedies under paragraphs (*a*) and (*b*) of this Clause,"

If deliveries were delayed, the Receiving Officer could send a " default report " to the Contracts Department, who then communicated with the firm. This process was repeated until either the goods were received or the delays became so serious that it was necessary to purchase the goods elsewhere.[1] In normal times no attempt was made to get into personal touch with the firm or to ascertain and remedy the causes of delay.

On the completion of a contract, the Receiving Officer reported to the Contracts Branch on the extent of any delay and the amount of liquidated damages incurred under the terms of the contract. The contractor having been asked to show reasons why the penalty should not be enforced, the case was submitted to the Military Branch (or where damages exceeded £100 to the Finance Member), with a recommendation whether the penalty should be imposed or not—the penalty was in fact insisted on only in very exceptional cases.

(*e*) List of Contractors.

In peace time the Contracts Branch published in all the leading newspapers and trade journals an "Annual Notice of Army Contracts."[2] This stated that " tenders for specified quantities of the undermentioned manufactured goods are invited from time to time as required." The principal articles bought were enumerated under the following heads :—Metal trades, etc. ; Textile trades, etc. ; Electrical and Scientific Instruments trades ; General trades. Manufacturers were further invited to apply to be placed on the War Office lists. It was not, however, the custom to invite firms to apply to be placed on the list for warlike stores. Firms properly equipped for this purpose were expected to approach the War Office, since they would be more or less dependent on Government orders, and as a rule they could not get foreign Government orders until they were on the War Office list.

Most of the lists of approved firms were adequate to meet peace requirements.[3] In September 1914, when Mr. Wintour was appointed,

[1] Under condition 4 (*b*) of the contract form in use (Army Form K. 1271) which provides for purchase in default. A copy of this form is given in Appendix I.

[2] 94/Gen. No./35.

[3] The following are the lists of firms which were formally invited to tender for shell :—

Lyddite or H.E. Shell.

Messrs. Armstrong.
,, Cammell Laird.
,, Firth.
,, Hadfields.
,, Projectile Co.
,, Vickers.

Shrapnel Shell.

Messrs. Armstrong.
,, Beardmore.
,, Cammell Laird.
,, Firth.
,, Hadfields.
,, King's Norton Metal Co.
,, Projectile Co.
,, Vickers.
,, Watson Laidlaw.

the lists were found to be insufficient to meet the then demands, and were very largely increased.

When new firms were required it was the function of the Contracts Branch to find them, with the assistance of the Inspection and Factory Branches at Woolwich and sometimes of the Military Branches. After the formal enquiries as to financial status, etc., the works of the new firms were usually inspected by representatives of the Contracts Branch and the Inspection Department, Woolwich. With the concurrence of the Military Branch concerned, the firm could then be noted.[1]

Once a year each list of firms to be invited to tender for a particular article was revised. Firms who had six times consecutively failed to respond to an invitation to tender were removed. The remainder were retained with the approval of the Military Branch. In a few cases firms were classified according to past performances, and considerable orders were entrusted only to Class I firms. The others had to prove their worth by executing small orders before being promoted to Class I. As a rule, firms were removed from the list only for very serious offences.

(*f*) Allocation of Orders.

At the beginning of each financial year the Board of Admiralty and the Army Council drew up a programme of requirements for the year. The items were provisionally allocated by the Contracts Branch between the Ordnance Factories and the trade, after taking into consideration their relative capacities and costs of manufacture. The allocation was finally approved by a committee consisting of Admiralty representatives, the Master-General of the Ordnance, the Director of Artillery, the Chief Superintendent of the Ordnance Factories, the Finance Member, and the Director of Army Contracts.

Whenever the orders for munitions were not sufficient to keep all the regular makers busy, the Contracts Branch, as trustees of the trade, were careful that orders should be allocated in such a way as to keep both the Royal Factories and the trade firms from shutting down. The general principle observed was, so far as possible, to keep a constant minimum number of hands employed at the Royal Factories, allowing a margin for sudden expansion in emergency, and to throw the fluctuations on the trade. Orders were occasionally placed with trade firms, e.g., for certain natures of shell, even though the tender price might be in excess of the Ordnance Factory estimate, on the ground that the firms might be unable to supply shell of that nature on mobilisation if they were not given orders in time of peace.

(*g*) Control of Costs.

The section known as Contracts T.R. (i.e., Trade Records) kept records showing how the costs of production of the several classes of munitions in the Ordnance Factories (as shown in the annual accounts published by the Chief Superintendent of Ordnance Factories) compared with the average prices paid to contractors for the articles in the same

[1] Mr. Wintour's evidence before the Public Accounts Committee, 1916 (115 of 1916).

period. These records were of considerable value in keeping down contract prices. They would have been more useful if the Ordnance Factory system of costing had been more in line with trade custom, and if the costs could have been more quickly produced. It should be understood that the great number and complexity of the manufactures made these Ordnance Factory accounts very elaborate, and, as they were primarily designed for purposes of parliamentary accounting, the cost results were arrived at only some six months after the end of the financial year. Further, the accounts dealt only with expenditure actually incurred by the Government, and accordingly did not embrace such elements as profits, interest on capital, or rent of Government lands, in any form. Another disturbing factor was that the Ordnance Factories were not run purely on commercial lines, but were governed by the above-mentioned order to maintain a fixed nucleus of staff with a view to expansion in time of war. The result was that, in comparing the costs with a contractor's selling price, certain allowances had to be made. In spite of these impediments, the War Office was able to use these accounts as giving a standard of costs for warlike stores. Thus in some cases, such as rifles and machine guns, where effective competition by tender could not be secured, contract prices were settled by negotiation on the basis of Ordnance Factory costs.[1]

IV. Financial Control.

The control of the Treasury over naval and military expenditure in time of peace is normally exercised in three principal ways :—

(1) The total sums to be provided for the Army and Navy respectively are approved by the Chancellor of the Exchequer, and detailed estimates working up to the approved total are submitted to the Treasury for approval before being laid before Parliament.

(2) Treasury sanction is required for material deviations from the Parliamentary estimates, and for meeting excesses on one vote from savings on another vote within the total sum granted by Parliament to the Department concerned.

(3) Prior Treasury sanction is also granted for all Royal Warrants, Orders in Council, and other regulations which affect expenditure, and (with certain exceptions) for establishments, scales of personal remuneration, permanent works, payments outside the terms of contracts, and losses or fruitless payments.

In so far as considerations of finance affect military policy in the larger sense, the machinery by which they operate comes under the first two headings above. To take a simple illustration : if the Army Council desired in time of peace largely to increase the artillery, that would presumably involve, if not an excess on Army votes as a whole, certainly an excess on one or another vote or sub-head, with the result that the increase could not be made without Treasury approval in the course of any financial year. If the increase were proposed to take effect in the following financial year, it would affect the total of the Army

[1] *Report from the Committee of Public Accounts*, 31 July, 1917, p. 214 (123 of 1917). The work of the Trade Records Section was dropped at the outbreak of war, the staff being required for more urgent duties.

estimates for the following year, and again would require Treasury sanction.

Under the conditions of the war, the machinery described under the headings (1) and (2) was not in operation. No detailed estimates were submitted to Parliament or to the Treasury, and there was no Parliamentary limit of an operative kind to the sums which the Army and Navy could expend.

Under heading (3) there was comparatively little deviation from peace procedure. The Treasury, however, gave a larger measure of general authority to the War Office under several of the principal divisions of expenditure, and by the Treasury Minute of 8 December 1914, provided a "safety valve," waiving the requirement of Treasury sanction for expenditure certified by the Secretary of State as vitally necessary and urgent. This procedure was made use of by the War Office almost solely in connection with building works.[1]

This relaxation was extended by a Treasury Minute of 29 January, 1915, which dealt particularly with Admiralty and War Office contracts for munitions of war. It was pointed out that the general principle that spending Departments are responsible for their own contracts would not in ordinary times cover the cases of contracts containing unusual financial provisions, such as specific capital advances to contractors for plant, etc. In the present emergency, however, it was not possible to insist on this requirement. The Chancellor of the Exchequer had, therefore, agreed that throughout the war such contracts should be concluded without reference to the Treasury. Responsibility for controlling expenditure was thus thrown back upon the Department, and especially upon the officials who occupied the posts of Assistant Financial Secretary and Director of Army Contracts, the former being primarily concerned as Accounting Officer, the latter as responsible for fixing prices.

The division of responsibility for contract expenditure in normal times may be described as follows : The three main points in a contract are (1) the quantity, (2) the conditions as to inspection, delivery, payment, etc., (3) the price. (1) The main questions of quantity, such as how many rifles or uniforms are wanted, are not, either in peace or war, subject to Treasury control ; but in peace they are governed by the limitation imposed by the Committee of Supply on the estimates. The estimates are drawn up by the Finance Department and the Military Department in conjunction, so that the Finance Department is aware of what quantities of stores are represented by the sums of money in the estimates. In that sense the quantity ordered is normally liable to financial control. (2) The conditions of contracts in peace time are usually what may be called sealed pattern conditions which have been considered by all the branches concerned. If any departure from those conditions is contemplated, the Director of Contracts customarily consults the Finance Department. (3) The price paid is not subject to financial control. It depends upon a special knowledge of markets, of contractors, and of all sorts of business considerations with which the

[1] *First and Second Reports from the Committee of Public Accounts*, 8 August, 1916, p. 206 (115 of 1916).

Accounting Officer of a large Department could not be expected to be conversant. Accordingly, under peace conditions, the Accounting Officer has no direct responsibility for prices. His duties as laid down by Order in Council are to act as deputy and assistant to the Finance Member of Council, and to advise the administrative officers at the War Office and in commands on all questions of Army expenditure. "As the Accounting Officer of Army votes, funds and accounts, he shall be charged with the allowance and payment of all monies for Army services; with accounting for and auditing all cash expenditure and preparing the annual accounts of such expenditure for Parliament; and with auditing all manufacturing, expense, supply, and store accounts."

Under war conditions, the situation was very largely changed. The Accounting Officer was still not responsible for prices in contracts of the ordinary type; but a very large number of contracts were made on abnormal conditions, and in these cases the Finance Department shared the responsibility with the Director of Contracts.

The prices paid under the early contracts with the armament firms were high. The Government did not wish to commit itself for more than a few months in advance, and at the same time new fixed capital had to be provided by the firms, who may have shared the popular opinion that the war might be over in a few months. In these circumstances the manufacturers were naturally unwilling to undertake the work except for high prices.

At the expiration of the first contract, the firm, if its performance had been reasonably satisfactory and further supplies were needed, was normally offered a continuation order at its full output subject to three months' notice to discontinue.[1] The opportunity was then taken to attempt a reduction of price; but the manufacturers usually pleaded that rises in wages and in the cost of materials made any reduction out of the question. It was not possible to cut down prices substantially before the winter of 1915, when cost returns could be obtained from the National Shell Factories, which showed that the prices still being paid to armament firms were unjustifiable. A considerable number of running contracts were then terminated, and drastic reductions were effected, which will be described in a later volume.[2]

V. Contract Administration under War Conditions.

(*a*) Organisation of the Contracts Branch.

The actual work of the Contracts Branch was distributed among several sections under the supervision of the Director of Army Contracts with an Assistant Director of Army Contracts.[3]

Contracts 1.—Purchases and sales of warlike stores (including Indian and Colonial orders); scientific instruments; electrical

[1] It was explained in a letter of 30 May, 1916, from the Director of Munitions Contracts to Messrs. Armstrong, that "three months' notice" meant "that shells will only be accepted which can be completely finished and actually despatched within three months of receiving notice to stop." (94/Gen. No./440).

[2] Vol. III, Part II.

[3] *War Office Administrative Directory, 1914.*

stores ; timber, chemicals, oils and medicines ; leather, harness and saddlery, furniture ; earthenware, glass and miscellaneous manufactured articles in metal and wood.

Contracts 2.—Purchases and sales of supplies ; fuel ; building materials ; clothing ; textiles ; india-rubber goods (except tyres) ; boats ;

Contracts for works, barrack services, transport and advertisements.

Review of all contracts accepted locally.

Contracts 3.—Purchases and sales of mechanical transport and other vehicles ; bicycles ; metals ; machinery.

Contracts : *Trade Records*.—Inspection of works of contractors, and local investigation of industrial conditions. Supervision of trades' records, investigation of questions of labour and wages connected with army contracts.

Issue and receipt of tenders.

The two sections of the Contracts Branch with which this review is specially concerned, are the Armament Contracts Section of Contracts 1, known as "Contracts 1A," and "Contracts 3." The Armament Contracts Section underwent certain administrative changes, which must here be reviewed. This section, Contracts 1A, purchased "warlike stores" and scientific and optical instruments. "Warlike stores" included guns, gun ammunition, small arms, small arms ammunition, explosives and ingredients. With the exception of high explosives and ingredients, these stores continued to be in the charge of this section up to the formation of the Ministry of Munitions.

After the abrogation about 1906, of the old practice by which this section purchased all supplies of the above stores for the Navy as well as for the Army, the Admiralty and the War Office continued to exchange copies of all contracts for similar classes of munitions, in order that the prices paid might be compared. In spite of this precaution, however, the interests of the two Departments frequently clashed, and competition between them was not eliminated. The practice continued in force between the Admiralty and the Ministry of Munitions.

When war broke out, the staff of the section consisted of one staff clerk, three second division clerks (one of whom was removed almost at once), one assistant clerk, and three copyists. The head of the Contracts Branch was Mr. de la Bère, Director of Army Contracts, an experienced administrator accustomed to the elaborate procedure which obtained between the Contracts Department and the Department of the Master-General of the Ordnance. On 26 September, 1914, Mr. de la Bère left the War Office and was succeeded by Mr. U. F. Wintour from the Board of Trade, who brought to his task width of outlook and familiarity with the industrial organisation, acquired during his service in the Exhibitions Branch of his former Department.[1] Among

[1] "On the outbreak of war we developed what may be called a new organisation. A very valuable public servant, and one who has rendered great public service, was compelled by ill-health to withdraw from the work of the Contracts Branch. He was replaced by a man who came from the Board of Trade . . . . where he had the great advantage of studying the general industrial conditions of the country." (Mr. Harold Baker, M.P., Financial Secretary to the War Office). *Parliamentary Debates* (1914), *H. of C.*, LXVIII., 1447.

the assistants whom Mr. Wintour brought in was Mr. P. Hanson, who was put in charge of Section 1A.

Mr. Wintour, from the outset, took up the position that a contracts department could not properly fulfil its duties unless it acted as a supply department. In the case of the supplies (food, clothing, etc.) belonging to the province of the Quartermaster-General, Mr. Wintour, was able, with some exceptions, to put his theory into practice. The position as regards the Master-General of the Ordnance stores was different; the functions of supply remained with the Master-General of the Ordnance and his deputy, the Director of Artillery. Mr. Wintour accordingly withdrew his personal attention to a great extent from this department and left it to the control of Mr. Hanson, the latter was thus in the position of making such bargains as he could with firms selected by, and receiving instructions from, the Director of Artillery. Section 1A thus began to act more and more as a branch of the Master-General of the Ordnance's Department.

The dependence of Contracts Section 1A on the Department of the Master-General of the Ordnance, which had been made effective in January, 1915, was formally recognised at the beginning of April, 1915, by the transfer to the Master-General of the Ordnance of the contract business relating to warlike stores (other than high explosives) and scientific instruments, including purchases for the Indian and Colonial Governments.[1] The section previously known as Contracts 1A accordingly reported henceforth to the Director of Artillery, and was known as A7.

The personnel of the section at this time consisted of Mr. P. Hanson, Civil Assistant to the Director of Artillery; Mr. W. G. West, Acting Assistant Principal; Messrs. W. M. Foster, R. H. Carr, C. J. Phillips and A. M. Samuel, Personal Assistants to Mr. Hanson; and Mr. C. C. W. Burrage, Staff Clerk; together with eight second division clerks, five assistant clerks, four copyists and nine temporary men clerks. The duties of A7 were limited to the purchase of the stores above mentioned; statistical records of such purchases; and the allocation of orders between the Ordnance Factories and the trade. In order to secure continuity of contract procedure and policy, other questions were to be referred to, or dealt with, in consultation with the Director of Army Contracts.

On 1 January, 1915, the provision of high explosives was put into the charge of a new branch (A6) of the Directorate of Artillery.[2] The duties of A6 included the supervision of all contracts for high explosives and ingredients, and a small staff for financial and accounting duties was detached from M.G.O.F. At the same time, Lord Moulton, as chairman of the Committee on High Explosives,[3] was given executive authority from the Master-General of the Ordnance, in conjunction

---

[1] War Office Memorandum 801 (5/4/15); 1/Gen. No./1508.

[2] Contracts/T/4920. War Office Memorandum 795.

[3] Appointed in November, 1914, "to consider and advise as to the steps which should be taken to ensure an adequate supply of high explosives for the British and Allied Governments, and of the materials and products necessary for their manufacture."

with the newly-appointed Assistant Director of Artillery, Brigadier-General Savile, who joined the Committee as the War Office representative.

From April, 1915, accordingly, the War Office contracts business so far as it related to warlike stores and aircraft, was allocated as follows :—

A.6 (M.G.O. Department) High explosives (Propellants were transferred to A.6 in June, 1915).

A.7 (M.G.O. Department) Warlike stores, other than explosives and scientific instruments.

Director of Military Aeronautics, M.A.3. Contracts for aeronautical supplies.

This arrangement lasted until A.6, A.7, together with Contracts 3, the section responsible for mechanical transport supplies and metals, were transferred to the Ministry of Munitions.

(*b*) Staff.

We have seen that at the outbreak of war the staff dealing with the supply of munitions at the War Office consisted of about 52 persons serving under the Director of Artillery, and about eight persons in the Armament Section of the Contracts Department, 60 in all. At the time when it was transferred to the Master-General of the Ordnance the Contracts Branch had increased to 33. The Director of Artillery's staff had also expanded, and an independent organisation under Lord Moulton was growing up at Storey's Gate. The expansion was rapid during the succeeding months, a new organisation, known as the War Office Armaments Output Committee, being instituted by Lord Kitchener in April to supplement the work of the Director of Artillery.

The Ministry of Munitions took over large sections of the existing staff engaged on supply and rapidly multiplied their number. On 1 July, 1915, the total staff of the Ministry was 688, of whom 385 were engaged on work directly related to the production of warlike stores, including trench warfare material and explosives. On 1 October this total had reached 2,350, of whom, perhaps, 1,400 were employed on supply matters.[1] The number in the Department of Munitions Contracts alone was 127.

The following summary by an official of the Contracts Department indicates some of the difficulties under which the work of the staff was carried on during the early months of the war :—[2]

1. The failure to provide staff adequate in either numbers or competence.

2. The chaos caused by the contempt for " red tape " of the men with commercial experience who were brought in.

3. The ordinary Civil Servant's ignorance of commercial matters and consequent incapacity for transacting business with contractors.

4. The difficulty of making full use of the experienced junior members of the staff who could not be placed in charge of officials of higher grade introduced from elsewhere.

---

[1] Hist. Rec./R/263.3/27. [2] Hist. Rec./H/500/10.

5. The difficulty of finding time to train new comers.

6. The inadequacy and overcrowded character of the accommodation and the long 14-hour day had an injurious influence upon the efficiency of the staff.

(*c*) Number of Contracts Placed, 1914–15.

The significance of the foregoing hindrances to efficient administration will be realised when they are considered in the light of the volume of work for which the Contracts Department was responsible. In this connection attention may be directed to the appended statement[1] which exhibits the number of orders for warlike stores placed with trade contractors during the 12 months immediately preceding the war in comparison with those for the 12 months ending July, 1915.

When the war broke out the existing procedure was at first maintained, but step by step modifications were introduced, which resulted in a considerable relaxation of checks and speeding up of decisions. Had the demand for supplies sprung suddenly to great heights it might have led to an early recasting of the machinery ; but, as it was, the inception of the new system was gentler than might have been expected. The moratorium, of course, caused some abnormality, and the general disturbance of business upset calculations. But on the other hand, there was a breathing space before the Expeditionary Force was in contact with the enemy ; moreover the growth of that Force and—more important still—the growth of the plans for extending and reduplicating the Army in the field, were gradual and unforeseeable.

Throughout August and September, therefore, orders for shells, for example, were passed from the Master-General of the Ordnance to the Contracts Department in the form of individual demands for fixed quantities, and it was left for the latter to issue tender forms to approved firms and allocate the orders in the usual manner. The Master-General also arranged for the Royal Ordnance Factories to produce to capacity.

(*d*) Sub-Contracting.

One of the first directions in which relief was sought from the pressure of new orders was in a relaxation of the regulation regarding sub-contracting.[2]

By the terms of the Fair Wages Clause, incorporated in the standard form of War Office contract, the contractor was prohibited from "transferring or assigning, directly or indirectly, to any person or persons whatever, any portion of his contract without the written permission of the Department." Subletting other than that which might be customary in the trade concerned was prohibited ; and the contractor was held responsible for the observance of the Fair Wages Clauses by the sub-contractor.

It was clearly sound policy on the part of the War Office, who had no expert staff available for training new firms, to allow these to accept orders from experienced contractors who thus became responsible for aiding during the most difficult period. The alternative plan of placing

[1] Appendix II.

[2] Hist. Rec./H/500/10.

direct contracts with untried firms and leaving them unaided to find out by hard experience the best way of producing an acceptable article, would have resulted in an enormous waste of time, labour and material, and in the swamping of the inspector's department with masses of material which had to be rejected. By allowing the experienced firms to sublet, and holding them responsible for the quality of the product, the work of training was spread among all those who were capable of teaching.

Accordingly, when inexperienced firms applied for work on munitions, they were classified according to the class of work which they offered to undertake, and lists compiled in this manner were circulated to firms from whom tenders were invited. These lists would have been even more valuable if they had been verified by a competent inspecting staff of skilled engineers such as was subsequently established by the Ministry of Munitions. Some assistance in this direction was in fact rendered by the Board of Trade, who reported upon the capacity of applicant firms in certain cases, but these reports were not always based upon adequate knowledge of the technicalities of munition making. The Trades Records Branch, the one branch of the War Office whose duties included the local investigation of industrial conditions, had been abolished upon the outbreak of war.

The Inspection Department at Woolwich was the natural authority to provide the help required. But here again there was no reserve of skilled man-power, and the inadequate and overdriven staff could not be spared to inspect the plant of potential contractors. The most effective assistance in their power was the advice they were able to give to contractors who visited Woolwich. Here samples and drawings could be examined and difficulties discussed. Unfortunately, since the Inspection Department was not the supply authority, it was not in a position to know the relative urgency of different components or supplies. Moreover, its resources were restricted, its supply of drawings and specifications very limited, and even in the matter of gauges it could give little practical assistance to a firm not already equipped.

Early in 1915 a step forward was taken by the appointment of Major-General R. H. Mahon, C.B., as the Master-General of the Ordnance's representative, to visit and report upon untried firms offering their services as contractors for munitions. This resulted from an enquiry addressed by Mr. Hanson, the officer in charge of armament contracts, to the Director of Artillery, on 22 January, 1915.[1]

Mr. Hanson anticipated that the campaign undertaken by the Board of Trade about this time would be likely to result in a flood of enquiries from contractors whose productive capacity was unknown. The Director of Artillery suggested that such enquiries should be referred to the Inspection Department at Woolwich, where specimens of components required could be inspected, and that the Chief Inspector should arrange to inspect the works of promising firms. The Chief Inspector, however, reported that while he was prepared to arrange for visitors, he had no staff to act as travelling inspectors, and this

[1] 94/Gen. No./7.

latter function was therefore assumed by Major-General Mahon, who continued to act in this capacity during the following critical months. He was also responsible under the Master-General of the Ordnance for the issue of war service badges to firms employed on munitions manufacture who wished to secure exemption from recruiting for their indispensable workers.

(*e*) THE UTILISATION OF EXPERT COMMERCIAL KNOWLEDGE.

The administration of War Office contracts did not escape Parliamentary criticism during the autumn of 1914. Such criticism rested for the most part upon a growing feeling that military officialism imposed a barrier between the commercial community and the War Office; that the War Office was ignorant of commercial usage, and that its procedure was cumbersome and tortuous and unfavourable for securing the immediate and large scale results which the crisis demanded; that, on the other hand, the administration was extravagant, and that contractors were reaping undue advantages. It was frequently suggested that a civilian committee should be appointed to supervise the placing of War Office contracts, and so relieve the pressure upon the officials and secure that administration was guided by sound technical knowledge. Mr. Wintour, as we have seen, was fully alive to the desirability of better commercial control. A proposal made to the War Office in October by Mr. George Booth had resulted in the appointment of certain consultative trade experts, Mr. McClellan for the steel trade, Mr. J. S. Oliver, of Messrs. Debenham & Freebody, for the clothing trade, and Mr. Cecil Baring for American orders.[1] On 26 October, Mr. George Duckworth laid before Sir Reginald Brade a memorandum drawn up in consultation with the Rt. Hon. Charles Booth and Mr. George Booth, which contained proposals for establishing a system of consultative trade committees for each of the principal trade groups linked up to the Contracts Department by means of an expert adviser. A small beginning was made in this direction and the House of Commons was assured on 23 November that all was well :—

> "I should be very glad," said Mr. Harold Baker, M.P., Financial Secretary to the War Office, "to have any help that could be given by anyone; but I would ask the House to remember that the Contracts Branch of the War Office is a machine that is very well organised in peace and which is served by great devotion and ability by the officials at the War Office. I believe that it has been re-organised to work well in war also. It is by no means composed solely of soldiers and of permanent civilians who were there before the war broke out. A vast quantity of expert civilian assistance has been brought in which has been of the very greatest possible value to us, and I do think that, with this civilian assistance already incorporated in that portion of the work, it might hinder the work very seriously indeed if you had an inquisitorial Committee standing over them and scrutinising every contract which they had to make."[2]

[1] HIST. REC./R/500/1.
[2] Parliamentary Debates (1914), *H. of C.*, LXVIII, 852.

Three days later Mr. Baker further stated :—

> " We have had at the War Office for some time buyers, and besides buyers, advisers . . . . men of wide experience whose knowledge is of great value, men who do not give and do not accept contracts, but men who furnish just that element of special business experience which it is said we need so much."[1]

Public uneasiness in regard to this matter was, however, not easily allayed, and much pointed advice was offered on points affecting War Office contract administration. Attention was drawn to matters affecting clothing, barbed wire, building, bedding and furniture, food, timber supplies and hutting, but little, if any, reference was made to matters affecting the output of essential munitions, such as rifles, guns or ammunition, except from the standpoint of labour supply and recruiting.[2]

Sir John Harmood-Banner, speaking on the 9 February, 1915,[3] complained of the want of accessibility of the War Office where contractors were concerned, and suggested that the scale of business had grown to a point beyond the capacity of the old system, " There are plenty of able men quite ready to give their services in the purchase of stores and to assist the War Office in any way they can." (In this connection reference was made to an advisory committee which dealt with clothing, though it was not empowered to intervene in contract questions.)[4] A few weeks later,[5] Mr. Baker again defended the War Office from the charge of ignoring industrial assistance and said that

> " for hon. Members, and even the Leader of the Opposition, to continue to suppose, as he appears to suppose, that the War Office is still acting without considerable and valuable advice from business men drawn from outside is a great mistake. . . . . We have almost from the beginning of the war been continually helped by people with full knowledge of the particular branch of trade as to which their advice has been asked. We have not widely advertised the fact, but we have taken care to choose men whose advice we knew we could trust, who we know to be disinterested, and who had a single mind and patriotic purpose in coming to our aid. That has been going on continually."

He hoped, however, that this system would be extended and that these advisers would be organised in a committee. There had been no failure to get the best possible civilian advice whatever branch of trade might be concerned.

The employment of expert buyers did not, in fact, overcome the difficulty inherent in the division of responsibility between the Contracts Branch and the Military Inspection Branch. Consequently the buyer was seldom authorised to settle offers on the spot, all he was able to

---

[1] Parliamentary Debates (1914), *H. of C.*, LXVIII, 1448.
[2] *Parliamentary Debates* (1915), *H. of C.*, LXIX. Mr. Tennant's speech on the Army Estimates of 8 February, 1915, and subsequent debate.
[3] *Ibid.*, p. 508.
[4] *Ibid.*, pp. 634 and 658.
[5] *Ibid.*, LXX, pp. 1092–3.

do was to bring pressure to bear upon firms able to tender, the contract being dealt with in the usual way.[1] Moreover, the employment of men directly engaged in trade as Government agents gave rise to many difficulties.[2] Only the exceptional man was wanted, and such a man was certain to be fully occupied. Even the best man is likely to be an object of suspicion, if not of open attack, on the ground of the unfair advantages which he secures over competitors, while on the other hand, it is essential that the agent selected should enjoy in the fullest measure the confidence of the trade with which he has to deal.

VI. Conclusion.

It will be realised from the foregoing that the organisation of the Contracts Department did not expand as rapidly as might have been anticipated under the stress of war conditions. Probably one of the principal hindrances was the tendency to regard the work of a civilian branch as of secondary importance, and the opposition aroused by any proposal which seemed to give authority to such a branch which might conflict with the military departments. Mr. Wintour when appointed Director of Army Contracts at the end of September, found himself in the position of a supply officer with only a partial and limited authority over the processes by which supplies were procured.[3] The military departments were responsible for estimates of requirements, for prescribing quality, for the allocation of contracts, for accepting deliveries, for inspection, and for administering the Ordnance Factories. The Contracts Department were only called upon to find contractors willing to provide what was required and to draw up and negotiate terms and ensure the reasonableness of prices. The manufacturer, accustomed to negotiate a deal throughout with a single customer, found himself dealing with an inspection authority and a contracts authority, neither of whom were competent to treat a bargain as a whole; and as the Contracts Department did not administer the contract when made, they had no first hand knowledge of the relative reliability of performance by different firms. Neither were they authorised to facilitate the placing of contracts or extension of supply where this involved any departure from specification or substitution for materials difficult to procure. Their ignorance of future, as distinct from present requirements, made it impossible to plan for increase of capacity, the demand for which was not yet formally registered.

Realising that these deficiencies were inherent in the system, Mr. Wintour, who had been invited by the Secretary to the Army Council to formulate proposals for re-organising the Contracts Department, submitted a scheme based upon the principle of making one authority responsible for the whole business of providing Army supplies, including negotiations as to price and the duty of watching and stimulating deliveries.

---

[1] Memorandum on War Office Contracts (February, 1916), Part IV (Copy in Hist. Rec./R/170/24).

[2] *Ibid.*, Part VI.

[3] Hist. Rec./R/500/64.

"It must be constantly borne in mind," said Mr. Wintour, "that the problem of securing supplies which now confronts the War Office is of an entirely different nature from any which it has previously met. In time of peace there is seldom any difficulty in obtaining any articles which the military authorities desire. The resources of the whole world are at the disposal of the War Office, and there is no lack of manufacturers to compete for the privilege of supplying all that is needed.

"The present case is otherwise. In many branches of trade the ordinary resources of the country are insufficient to produce all that is required. Manufacturers must be assisted in every way, their difficulties of labour and the supply of raw materials must be smoothed out and great care and thought must be devoted to the task of organising them to produce to the utmost capacity of their trade. If the new armies are to be equipped in time the co-operation of every available manufacturer and worker must be secured.

"It is in these circumstances useless to attempt to adhere rigidly to standard patterns and specifications, and it is essential to give greatly increased attention to such considerations as the comparative speed at which articles of slightly different types can be produced, the available supplies of raw materials, and the most fruitful use of labour and machinery."

* * * * * * * *

"The important part played by industry in fitting out an army has not been sufficiently recognised. The war is a war of organisation in which the raising of men is one very important item. It is equally important that they should be equipped, clothed, fed, and provided with guns, arms and ammunition. For the provision of these necessaries industry, and industry alone, has to be relied upon, and the rapidity and effectiveness with which industry can be organised to meet the emergency cannot but have an enormous influence upon the issue of the struggle."

* * * * * * * *

"Under the present system it has been difficult in many cases to obtain even an approximate idea of the extent of the orders which have to be placed in the future, and it is essential in any new scheme that provision should be made for preparing estimates showing probable requirements for three months, six months, and a year ahead. It is, of course, realised that rapid change of military plans makes it impossible to furnish any final estimates, but this in itself is no valid reason why rough estimates should not be prepared which would afford a sufficiently good working basis."[1]

This was a noteworthy formulation of what may be called the civilian aspect of the war, and might be taken as expressing the essential principles upon which the Ministry of Munitions relied for its inception and development. But whatever its prophetic significance, its immediate effect was not great; the time was not yet ripe.

---

[1] HIST. REC./R/500/64.

One of the innovations proposed by Mr. Wintour was, however, adopted in part, namely, the appointment of an additional member on the Army Council, whose duty should relate particularly to supply. On 18 December, 1914, Sir George S. Gibb was appointed additional Civil Member (temporary) for artillery contracts.[1] This appointment did not, of course, fulfil Mr. Wintour's proposal, which had aimed at co-ordinating responsibility for supply. Carried out in this form, it merely added another spoke to the wheel, and valuable and important as Sir George Gibb's experience and advice were in the handling of important negotiations and dealing with different problems of supply policy, the framework of the existing organisation remained practically unaltered. The full scheme was not realised until in May, 1917, a Surveyor-General of Supply was appointed, who was further made a Member of the Army Council, and whose duties embraced all "such functions as relate to the commercial side of the business of supplying the Army."[2]

This new authority not only assumed the responsibility of the Director of Army Contracts, but also took over executive supply duties from the military departments. Long before this came to pass, however, the business of munitions supply had been transferred to the new Ministry of Munitions.

---

[1] War Office Memorandum 792.
[2] War Office Memorandum 929. See also Vol. VII, Part I, Supplement.

CHAPTER III.

SOME EARLY WAR CONTRACTS.

I. The Difficulties of Supply: Orders for Small Arms Ammunition.

It is not necessary to emphasise the handicap with which the War Office entered upon its task. But it may, perhaps, be worth while to trace in a little detail the actual course of supply negotiations for a representative military supply during the first two months of the war, in order to exhibit the characteristic feature of this period, the hand-to-mouth scramble for supplies in a market whose output capacity was in the nature of the case severely restricted.

We may select for this illustrative purpose the organisation of output for small arms ammunition, both as being the primary military requirement for the maintenance of an army in contact with an enemy, and also as having been, in fact, a principal pre-occupation of the supply authorities at this time.

(*a*) The Position at the Outbreak of War.

The situation when war broke out was this. There were stocks in the hands of the Deputy Director of Ordnance Stores amounting to 29,000,000 rounds.[1] The maximum trade capacity of five regular contractors on 1 August, 1914, was 3½ millions a week under normal arrangements, but was capable of being raised to six millions a week if nightwork, the suspension of Factory Acts, and an abundant supply of material were secured.[2] The theoretical maximum capacity of Woolwich was 3½ millions.[3] Some three months earlier orders had been placed with the Birmingham Metal & Munitions Company, Messrs. Eley Bros., Greenwood and Batley, Kynoch, and the King's Norton Metal Company. The total order was for 27 millions,[4] but 22 millions were still outstanding, and completion was not expected for many months.[5]

(*b*) The First War Contracts.

Instructions were at once given to accelerate deliveries on these orders. Tenders for further supplies were called for on 4 August, and, after an interview at the War Office, the firms submitted their

---

[1] Hist. Rec./R/1440/2. By 2 October this quantity had shrunk to three million rounds.

[2] Contracts/C/7963. In 1900, working at full pressure, these same firms had given an average output of 3½ millions a week (75/3/1033).

[3] 75/3/2357 (October, 1913).

[4] Contracts/C/7749.

[5] Contracts/C/7963.

TRADE CONTRACTS FOR ·303 AMMUNITION MARK VII. [1]

Position at end of August, 1914.

Firm	Contract	Date	Quantity	Rate for Delivery	Due for Completion by†	Price per 1000	Maximum Rate of Output per week
Birmingham Metal & Munitions Co.	C/7749	15.5.14	3 million	per month 500,000	18.9.14	103/–	
	C/8134	21.8.14	48 million	per week 2,500,000	5.2.15	108/6	2,500,000
Messrs. Greenwood & Batley ..	C/7749	15.5.14	7 million	per month 875,000	25.9.14	99/– 108/6*	
	C/8134	21.8.14	18 million	per week 1,000,000	30.1.15	108/6	1,000,000
King's Norton Metal Co., Ltd. ..	C/7749	15.5.14	4 million	per month 750,000	25.9.14	101/4	
	C/8134	21.8.14	32 million	per week 1,800,000	30.1.15	108/6	1,800,000
Messrs. Eley Bros.	C/7749	15.5.14	6 million	per week 158,000	27.3.15	91/6–106/6*	
	C/8134	21.8.14	8 million	per week 375,000	13.2.15	106/6	550,000
Messrs. Kynoch Ltd.	C/7749	15.5.14	7 million	per month 2,000,000	12.9.14	99/3	
	C/8134	21.8.14	48 million	1,100,000 in 4 weeks then per week 2,400,000	7.2.15	108/6	2,400,000

* Increase in price for rise in cost of material, etc.

† The contracts placed 15/5/14 were originally due for completion as follows :—Birmingham Metal & Munitions Co. on 26/11/14 ; Messrs. Eley Bros., 27/3/15 ; Messrs. Greenwood, 9/3/15 ; Messrs. Kynoch, 17/10/14 ; King's Norton Metal Co., 10/12/14. An order for 20 million cartridges had also been placed specially with the Canadian Government for completion by 22/1/15.

[1] 57/Gen. No./3595.

proposals jointly in a letter of 6 August, 1914.[1] They indicated the rate of output they could attain if the Factory Acts were suspended, and suggested a Government embargo on dealings in essential materials, such as electrolytic copper, zinc, nickel, lead, and mercury. They quoted a standard basis price of 105s. per thousand cartridges, but stipulated that the price should vary according to the monthly variation in the basic price of materials, including cordite and fulminate. They asked for an advanced payment, equal to one-third of the value of the total order. The moratorium was at this time creating some temporary uncertainty and want of confidence, and the contractors had not yet felt their feet. The following extract from a letter to the Director of Army Contracts from the King's Norton Metal Company, dated 5 August, 1914, will serve to illustrate this passing phase :—

re War.

> " Sir,—Now that the above has commenced, you will readily understand that the whole of the conditions of supplies are altered for all classes of metals. We are now asked for cash against documents. I believe that the ammunition makers could procure their supplies without any difficulty if the payment were guaranteed by His Majesty's Government. . . ."

A fresh demand for 100 millions was issued, 21 millions being undertaken by Woolwich. The remaining 79 millions were allocated to the trade contractors, but before the formal contracts were placed it was decided to arrange for a second 100 millions, of which total the Ordnance Factory took 25 millions, leaving 75 millions, or 154 millions in all, for the new trade orders.[2] The annexed statement[3] gives the allocation of these orders and the prospective rate of output. Practically the whole quantity was due for completion by February, 1915, the maximum rate of delivery to be attained being $8\frac{1}{4}$ million cartridges a week.

(*c*) THE POSITION AT THE END OF AUGUST, 1914.

Great as was the expansion of pre-war supply thus initiated, it was barely sufficient to cover the requirements already in sight. A programme drawn up on 27 August, 1914, which compared the supply available and in sight with the requirements of the Army at home and overseas, showed a serious deficit in prospect for January, 1915, on the assumption that the first New Army might then be sent to the Front. The aggregate output for the first six months would be 458 million cartridges, against requirements of 499 million. Moreover, no provision was made in these calculations for the Territorial Division of the Naval Brigade, nor for any New Army subsequent to the first.

Important, and indeed formidable, as were the total requirements on British account, this was not the whole of the problem. Before the end of August Lord Kitchener received an urgent appeal for assistance

---

[1] Contracts/C/7963.
[2] 57/3/4287 ; Contracts/C/7963 and 8134.
[3] See above, p. 73.

from the Belgian Army, which in consequence of the invasion of that country, and the stoppage of industry, was very short of raw material. There were no stocks which they could purchase, and orders for the British Government made it impossible for manufacturers in this country to satisfy the additional requirements. It was, therefore, arranged by the War Office, on 27 August, that Messrs. Kynoch should give priority to an order on Belgian account for 20 million cartridges, which it was hoped to procure in ten weeks time. The same day the Master-General of the Ordnance reported to Lord Kitchener on the position of British supplies affected by this arrangement, and pointed out that all available sources, including America and Canada, were now being tapped,[1] but that he would be hard put to it to provide for the expanded requirements of the New Army in addition to those of Colonial and Territorial Divisions. Lord Kitchener insisted that Belgium must have her 20 million cartridges ; but he went much further. He gave peremptory instructions for "all manufacturers of small arms ammunition to provide themselves with fresh plant sufficient to enable their present output to be doubled in six months time or less." Expense was not to interfere.

Prompt measures were taken. The Chief Superintendent of Ordnance Factories was instructed to increase his Woolwich plant to provide an output of 10 million cartridges a week, and representatives of the principal contractors, Messrs. Kynoch, Greenwood & Batley, the King's Norton Metal Company, Messrs. Nobel and the Birmingham Metal & Munition Company (Messrs. Eley Bros. were not represented), met the Master-General of the Ordnance on 28 August, when the latter invited the firms to submit proposals for largely extending their output. Messrs. Kynoch were asked for an additional one million cartridges per week, and Messrs. Greenwood & Batley, Messrs. Nobel and the Birmingham Metal & Munitions Company (jointly) for a similar addition to their output. The King's Norton Company offered an increase after six months. In due course the firms formulated definite proposals. All of them contemplated a substantial advance in prices—amounting to about 20s. per thousand—which in the view of the Contracts Department was an excessive charge. The average price in the pre-war contracts had been about 100s. per thousand, and in the August contracts, 108s. 6d. per thousand. The subsequent negotiations may be briefly summarized.[2]

(*d*) Negotiations with Individual Firms.

Messrs. Greenwood & Batley.—This firm offered to accept an order for an additional 20 million rounds output at the rate of 500,000 per week, the price to be 129s. 6d. per thousand, their total output being thus raised to 1,500,000 per week. This price it was intimated would cover an anticipated increase in the cost of cordite which they had to

[1] An American firm, the Remington Arms Union, began to give deliveries before the end of 1914 on an order placed in August with the Canadian Government.

[2] See 57/Gen. No./3595.

buy. The firm were instructed to proceed (2 September, 1914), and in reply to the remonstrance of the Contracts Department in respect of the price asked, replied:

> "We note that you consider the price quoted for this ammunition is high, but we would ask you kindly to bear in mind . . . that in times of peace the existing plant of the various factories is capable of dealing with approximately four or five times the amount of cartridges ordered. That in view of the present urgent demand all manufacturers are increasing their plant very considerably, and that, therefore, when normal conditions again prevail the large increases made to the now existing plant will become useless.
>
> "We may further add that we understand it is the intention of H.M. Government largely to increase the cartridge plant at Woolwich, which will further prejudice the chance of orders being secured by contractors in time of peace.
>
> "In view of these temporary and abnormal conditions, we trust it will be recognised that it is necessarily incumbent on contractors to protect themselves against probable heavy loss of capital by asking rather higher prices than they would otherwise be ready to accept. The further conditions of the rise in the price of metal and of cordite, the enhanced cost of plant and a considerable rise in working expenses owing to overtime, etc., etc., have also a very direct bearing on the increase of price."

The price was by subsequent negotiation reduced from 129s. 6d. to 128s. 6d., at which price the formal contract was completed on 2 October, 1914. The firm entered a protest against the insertion of a penalty clause under which failure to complete deliveries by the specified date would entail reduction of price by 20s. per thousand rounds.

King's Norton Metal Company, Ltd.—This company submitted a proposal for building and equipping a complete plant capable of dealing with every stage of production, from the casting and rolling of the metal up to the final processes, and giving an additional output of from 2 to 2½ million cartridges per week, raising their total weekly output to 4 millions. They asked for a contract for the supply of 4 millions a week from March, 1915, to March, 1916, or a firm order for 100 millions. The terms asked were 128s. 9d. per thousand, together with a cash advance of £65,000. In a further communication the firm asked for some assurance as to their post-war position, having especially in view the presumption that the Woolwich plant would also be greatly extended. They maintained that "if in the past the various contractors had been subsidised, or kept going with regular orders for ammunition, the present emergency would not have occurred." The firm was told in reply that "on the conclusion of the war, orders for small arms ammunition will naturally contract to the peace scale, and no undertaking as to their extent can possibly be given."

On 8 September the firm were instructed to proceed in anticipation of a contract for an additional quantity of 45,000,000 cartridges, the price to be settled later. The firm, in acknowledging this order, took

the opportunity of "directing attention to the fact that we cannot be responsible for the work of other people, and, as we are in the hands of several for supplies, should they fail we must make it a condition that the contract should not be cancelled through such causes or delays."

The order was accepted on 21 September at 125s. per thousand, but the firm demurred to the application of the penalty clause under which cartridges delivered after completion date would be paid for at the rate of 108s. 6d. only, if such delays should be due to causes beyond their control. The War Office undertook that such circumstances should be given due consideration, provided that an output of 4 million cartridges per week had been attained.

In the event, only 9,400,000 cartridges were delivered within the specified time limit, the balance, 35,600,000, becoming liable under the penalty clause to liquidated damages amounting to £5,150.[1] The firm stated that among the causes of delay the excavating contractor had been two months behind time, that the plant was delivered late, that labour supply had been inadequate, and that appeals to the Government for assistance in securing toolmakers had met with little result. The claim was accordingly waived.

Messrs. Kynoch, Ltd.—Messrs. Kynoch pointed out (31 August, 1914) that in order to fulfil the instructions of the Master-General to increase output up to 3½ million cartridges per week the firm would be obliged to incur a very heavy capital outlay, and that both the existing contract for 48 millions and the contemplated order for 52 millions would be increased in cost. In the circumstances it would be best to cancel the previous contract and place an inclusive new order for 100 millions at 117s. 6d. per thousand, instead of an additional contract at 125s. per thousand, these two alternatives giving equivalent aggregates. The firm added that the prices proposed would fairly meet the added cost and risk, and no more. The War Office objected that the price proposed was very high, to which the firm responded that they were unable to accept this view.

> "We are constantly being brought up by things we had not allowed for, and which are the cause of additional capital or revenue expenditure. We do not think any other firm could have promised so large an addition to their regular output in anything like so short a time, nor do we think they would have been able to quote so low a price had they been able to produce the cartridges."

A formal contract for an additional 52 million cartridges at 125s. per thousand, with a clause reducing payments on late deliveries to 108s. 6d., was accepted by the firm on 28 September, 1914, with the following qualifications :—

> "You will notice that we have struck out from this tender the clause providing for reduced prices in the case of failure to submit the full quantities to time. Our Chairman pointed out to the Assistant Director of Army Contracts that we should not

[1] 94/C/1011.

be able to accept any clause such as this. The increased cost to us will be incurred practically in full, whether the exact output is attained or not. Consequently it is not fair to suggest that the price should be reduced for a slight failure in delivery which, should it occur, will not be due to any fault or lack of attention on our part. Before promising these deliveries we made every calculation for difficulties and contingencies, and you may confidently rely on our keeping our promises, but we cannot accept a fine greater than your usual one in case of the unlikely event which your additional clause provides for."

The War Office refused to accept the deletion of the clause, but agreed to make it inapplicable if the contractor could show that the delay was due to causes beyond his control, and that he had in fact reached the prescribed rate of output.

Nobel's Explosives Company, Ltd. and the Birmingham Metal and Munitions Company, Ltd.—Messrs. Nobel had been asked to equip their sporting ammunition factory at Waltham Abbey for the production of service ammunition at a rate of 1,000,000 rounds per week, these deliveries to be supplementary to the 2½ million per week ordered from the Birmingham Metal and Munitions Company. They calculated that the new equipment would cost 20,000*l.* including "a substantial premium for prompt delivery." They estimated that manufacture at Waltham Abbey would be much more costly than at Birmingham, by reason of the training of fresh workers which was involved. They quoted 126s. per thousand for an order of 48 millions, a quantity identical with that already contracted for with the Birmingham Metal and Munitions Company. Instructions to commence manufacture were given on 2 September, the joint output to work up to 3½ million rounds per week.

As in the cases already reviewed, Messrs. Nobel declined to accept the penalty clause for late delivery:

"We consider that in view of the exceptional circumstances surrounding this contract, the price of 126s. per thousand should apply to this order . . . . whether or not delivery is effected by 1 May, 1915. You are aware that we are equipping ourselves with plant for the manufacture of Mark VII ammunition for you and the price which we quoted to you for these cartridges was calculated upon a certain capital outlay which we had made upon the plant for the manufacture of the ammunition being recouped to us on the order for 48 millions. This being so we are being penalised if by any chance our deliveries to you are not completed by the 1 May, 1915, and we regret we cannot accept the first condition in the schedule attached to your contract form, which provides that cartridges not delivered by that date shall only be paid for at the rate of 108s. 6d. per thousand . . . . We feel sure that you do not desire to penalise us in view of the fact that you have accepted the principle of allowing us an increased price on this order to compensate us for the plant which is required specially for its execution."

As in other cases the War Office declined to delete the clause, but relaxed it to allow of extraneous causes of delay to be pleaded together with a concession of a period of grace. The contract was amended accordingly and was formally executed on 27 October, 1914, though in further correspondence the firm secured some further concession in regard to the application of the ordinary penalty clause imposing a fine for late delivery which formed part of the standing conditions of War Office contracts. The following clause was added as a common form clause applicable to contracts when the cost of plant was borne by the War Office.

> "This contract is placed on the understanding that the additional plant provided at the expense of His Majesty's Government will be held at the disposal of the War Office for the duration of the war. At the end of the war Messrs. Nobel's Explosives Company undertake to maintain the plant and keep it in good order. Should, however, Messrs. Nobel's Explosives Company desire to dismantle the plant or to use it for any other purpose which would render it unfit for the manufacture of small arms ammunition they undertake to give the Secretary of State for War one year's notice in writing before taking any such steps."

On 7 January, 1915 a further contract for 200 million was placed involving a fresh extension of the Birmingham Metal and Munitions Company's plant. These additional deliveries were to reach 5 million per week by the end of June, 1915.[1] At the end of March, 1915, on an order for 75 million, yet another extension was arranged, which was to yield an output of 4 million a week.[2] Thus by the end of the year these firms alone would be giving a weekly output of $1+2\frac{1}{2}+5+4$ millions, $12\frac{1}{2}$ millions in all.

Messrs. Eley Bros. Ltd.—Negotiations for doubling the contract previously placed by an additional order for 8 million rounds were opened on 7 September. The firm replied in these terms :—

> "We have already accelerated deliveries as promised, and up to the 4th September we had made deliveries amounting to 896,800 cartridges. We shall complete this contract within the time specified.
>
> "Further than this, by putting down some additional machines, and provided the Home Office will give us permission to work our women from ten at night until six in the morning (application for this permission has already been made), we could accept your order for a further eight million cartridges for delivery at the rate of one million per month, deliveries to commence in from five to six weeks from receipt of contract.
>
> "To cover the cost of putting down these additional machines and to meet the additional cost of the all night work, our price for this additional order for (say) eight million cartridges is 120s. per thousand."

---

[1] Contracts /C/9101A. [2] 15/Contracts/36.

This offer was conditional on success in procuring supplies of metal, cordite, etc. The firm were also prepared to report on the possibility of further increases to their plant, enquiries to this end having been already initiated by the Admiralty.

Instructions to proceed were promptly given and a draft contract sent, inclosing a penalty clause imposing reduction of price to 106s. 6d. in case of failure to reach the deliveries specified by the contract in any individual month. This severe condition was not unnaturally rejected by Messrs. Eley, who pointed out that it would be disadvantageous to the War Office also, since it would compel them to hold back surplus output in order to make good accidental deficiencies in any month's deliveries. A contract in modified terms was executed by the firm on 21 September, 1914.

(*e*) Significance of the Foregoing Examples.

The foregoing negotiations have been traced in detail, not on account of any exceptional or crucial features revealed therein, but rather, for the opposite reason, as a fair sample of the difficulties with which the War Office was confronted at every turn, and as an account which might be paralleled from the record of the supply administration of any other type of warlike stores. It is worth while, therefore, to follow this small episode in the history of munitions supply with some particularity, in order to realise the prevailing character of the activities of this period.

There is, however, a further justification for this study, the prophetic and symptomatic indications of the future developments contained therein. For there is hardly a single form of serious difficulty or hindrance subsequently experienced which is not plainly indicated in these early weeks of the war; the difficulties of establishing fresh capacity, of multiplying labour force, of procuring plant and of organising a complex productive unit in great haste; the inadequacy of the powers and experience required for a proper control of prices and the resulting mutual suspicion and difficulty in regard to terms, the War Office emphasising the extortionate character of the contractors' proposals and taking every opportunity to throw on the latter the fullest measure of contingent financial responsibility—in particular the loss of post-war capital valuation; the contractors wishing to safeguard themselves and secure exemption from penalties, etc., while allowing generously in their quoted prices, not only for the costs of immediate production, but more or less for hypothetical increases in wages and cost of materials.

II. Artillery Supplies during the first Months of the War.

During the first weeks of the war there was no clear indication of the probable length of the conflict, and Lord Kitchener's pronouncement on 25 August, 1914, that the terms of enlistment would be for three years or the duration of the war, was interpreted as being rather a measure of ample insurance than a deliberate judgment of

probabilities. In any case, it was inevitable that the first steps in the provision of munitions should be modest in extent.

It had been laid down that the reserves held under the Mowatt scheme would require supplementing within six months from the outbreak of war, and the earliest requisitions were based upon this principle being rapidly expanded to meet the necessity of supplying the augmented forces, which it was at once decided to raise. Thus, as early as 10 August, instructions were given for the provision of equipment and ammunition for the first new army.

Before proceeding to describe briefly the steps taken during the first two months of the war to provide guns, it will be well to give some account of the stocks in existence on the outbreak of war.

(*a*) GUNS AVAILABLE AT THE OUTBREAK OF WAR.

The pre-war production of British service guns from 1905–1914, including those manufactured on account of the Dominion and Indian Governments, had been as follows :—18-pdr. Q.F. gun for the Royal Field Artillery, 1,126 ; 13-pdr. Q.F. for the Royal Horse Artillery, 245 ; 4·5-in. field howitzer, 182 ; 60-pdr. B.L. heavy field gun, 41.

The distribution of these totals was as follows :—

	Home.	Canada.	South Africa.	Australia.	New Zealand.	India.	Total.
Field Artillery 18-pdr. Q.F.	797	136	16	104	24	49	1,126
Horse Artillery 13-pdr. Q.F.	174	24	28	—	—	19	245
Field howitzer 4·5-in. ..	139	14	—	—	8	21	182
Heavy field gun 60-pdr. B.L.	28	12	—	—	—	1	41

In addition to the above there had been manufactured in India 99 18-pdr. and 21 13-pdr. guns.

The scale of equipment laid down by the war establishments for the six divisions of the field army was as follows :—

	Guns.		Ammunition.	
	Batteries.	Total Guns.	Rounds per Gun.	Total Number.
18-pdr.	54	324	1,500	486,000
13-pdr.	6	36	1,900	68,400
4·5-in.	18	108	1,200	129,600
60-pdr.	6	24	1,000	24,000

The above represented the standard of equipment for the Expeditionary Force. Provision was, however, made for other

batteries, either stationed abroad or unallocated, training brigades, and reserve stores :—

	18-pdr.	13-pdr.	4·5-in.	60-pdr.
Field Army :—				
Batteries	54	6	18	6
Guns	324	36	108	24
Colonies :—				
Batteries	3	1	—	—
Guns	18	6	—	—
Unallocated :—				
Batteries	15	7	—	—
Guns	90	42	—	—
Reserve Stores :—				
Batteries	15	3	3	1
Guns	90	18	18	4
Total :—				
Batteries	87	17	21	7
Guns	522	102	126	28

In addition to the above there was a certain number of guns on hand in charge of training brigades and other units, raising the total number of guns available in Great Britain at the outbreak of war to 624 18-pdr. guns ; 126 13-pdr. guns ; 128 4·5-in. howitzers, and 28 60-pdr. guns.

Further, guns which were in the possession of Dominion and other overseas forces at the outbreak of war were brought over and became available during the winter of 1914–15. As will be seen from the following table, this does not completely exhaust the manufactured output ; the balance presumably represents guns condemned for wear, or otherwise unfit for service.

18-pdr.	India	240
	Canada	84
	Australia	36
	New Zealand	12
		372
13-pdr.	India	47
	Canada	12
		59
4·5-in.	India	12
	New Zealand	4
		16
60-pdr.	Canada	10

The total numbers accounted for were thus :—18-pdr., 996 ; 13-pdr., 185 ; 4·5-in., 144 ; 60-pdr., 38.

The equipment of the Territorial artillery was an armament of obsolescent guns which had been displaced in the case of the regular army by the equipments specified above. These earlier types of weapon were, however, serviceable, and substantial use was made of them in minor theatres of war during the interval which elapsed before they could be replaced by modern weapons. The numbers in existence and those subsequently utilised were as follows :—

	In existence.[1]	*Actually employed.*[2]
Territorial Horse Artillery :—		
15-pdr. Q.F.	85	20
Territorial Field Artillery :—		
15-pdr. B.L.C.	623	228
5-in. Howitzer	150	80
Heavy Field Artillery :—		
4·7-in.	164	88

A few siege guns were also available at the outbreak of war or subsequently were adapted for service in the field, the most important being :—

6-in. B.L. Mk. VII Guns	18
6-in. 30-cwt. B.L. Howitzers Mark I*	24
9·2-in. B.L. Howitzer	1

These were semi-mobile equipments, and a certain number were subsequently adapted for service in the field and sent to the front. The 6-in. Mark VII guns were those taken from coast defences, where they were erected on concrete platforms, and were placed on extemporised field mountings, the first eight being sent to France in January, 1915. They were very heavy and their lives were short, but they were at that time the only means of satisfying the demand for a long range weapon. They could fire a 100-lb. shell over 17,000 yards. Of the 6-in. howitzers a single brigade was in existence at the outbreak of war. In addition to these, a number were collected from various garrisons and colonial stations and were converted to fire a 100-lb. shell and put in the field. They were subsequently replaced by the new 6-in. 26-cwt. howitzer. They did extremely good service, but they were cumbersome and their range with 120-lb. shell was only 4,800 yards, and even with the light 100-lb. shell was limited to 6,500 yards.

The only effective and utilisable gun of really heavy calibre was the solitary 9·2-in. howitzer, which could throw a 300-lb. projectile a distance of 10,000 yards.[3] This howitzer had passed its tests in June,

---

[1] Note by Secretary of State for War, 31 May, 1915, Appendix III (HIST. REC./R/1000/120).

[2] HIST. REC./R/1000.3/9.

[3] The 15-in. howitzers ordered in November, 1914, by Mr. Churchill, then First Lord of the Admiralty, had a similar range but fired a projectile weighing 1,450 lb. The 12-in. howitzer of improved design supplied some years later had a range of 14,500 yards. By the time of the Armistice the 60-pdr. gun could fire 15,000 yards and the 12-in. gun gave a range of 33,000 yards.

1914, and possessed outstanding value as an up-to-date model. This weapon was sent to France in November, 1914, as soon as service ammunition could be got ready for it, and served as prototype and precursor of a numerous family, being universally known in the Army by the name of "Mother."

There were available in the country, in addition to the foregoing, a certain number of obsolescent heavy guns intended for fixed emplacements, to which recourse might be had in case of necessity. Of these the 6-in. B.L. howitzers Mark I (with platform) were of importance, since they could be converted to Mark I (with carriage and limber). There were 24 converted howitzers and 36 unconverted in hand, making a total of 60 available, exclusive of those otherwise appropriated. There were also 16 6-in. B.L.C. guns, with a range of 12,000 yds., and capable, in spite of their weight, of being travelled in lorries. There was less possibility of utilising the 18 10-in./9-in. R.M.L. guns, which weighed 12 tons each, and their mountings 17 tons 10 cwt. each, though their employment in the field (siege train) was at first contemplated. The four 9·45-in. howitzers were weapons of lighter weight, acquired during the South African War, but of very unsatisfactory accuracy and range. Finally there were eight 8-in. R.M.L. howitzers, but these weapons were also unsuitable.[1]

(*b*) The First Orders for Guns.

During August and September, 1914, arrangements were made for a large output of field guns from the Ordnance Factories and the trade. On 8 August the Deputy Director of Ordnance Stores, Woolwich, was asked to give an "urgent extract" for 18 18-pdr. complete equipments, and by the end of the month the number had been increased to 68, for delivery by the middle of 1915.[2] Tenders were also called for from the armament firms, and on 25 August Messrs. Armstrong and Vickers were instructed to proceed with 78 18-pdrs. each. The 4·5-in. howitzer was also ordered at once, the Ordnance Factories on 13 August promised 30 complete equipments,[3] arranging with railway companies for assistance with the carriages, and on 25 August an order for 60 was given to the Coventry Ordnance Works,[4] the firm from which the first howitzers had been ordered in 1908.

During the following weeks these early orders were by successive stages greatly increased, in the hope of securing earlier and larger deliveries. By the first week in October Messrs. Vickers had undertaken to deliver 360 18-pdrs. before August, 1915, and Messrs. Armstrong 450,[5] while the Coventry Ordnance Works' order for 4·5-in. howitzers had been doubled, the whole number being promised by the end of June, 1915.[6] Thus, during the first two months of the war

---

[1] Memorandum prepared by A2, 17 September, 1914 (Hist. Rec./R/170/25).
[2] 57/3/4247.
[3] 57/3/4259; 73/4/6500.
[4] Contracts/G/1599.
[5] A2 Returns and Order and Supply Lists.
[6] Contracts/G/1653.

orders were placed for a total of 878 18-pdrs. and 150 4·5-in. howitzers, the bulk of the deliveries being expected during the first six months of 1915. The further expansion in orders for field guns which took place during October will be described below.[1]

In the meantime the first steps had also been taken towards the provision of heavy howitzers. At the end of August inquiries had been made of Messrs. Vickers as to the possibilities of bulk production of 9·2-in. howitzers, and on 4 September the firm were instructed to proceed with 16 complete equipments, promising first deliveries in seven months' time.[2]

In September important developments took place with regard to heavy howitzers. In the middle of the month an expert committee, known as the Siege Committee,[3] under Major-General Hickman, was called together to consider what steps should be taken to supply the artillery which might be required "in the event of the Allies being brought face to face with the fortresses on the Rhines." On 19 and 23 September the committee urged the supply of

(*a*) 32 heavy howitzers, firing shell of 750 lbs. or more ;

(*b*) 48 medium howitzers, firing shell of 300–400 lbs. or more ;

(*c*) 60 light howitzers (6-in.).

A certain number of the howitzers called for by this programme were already in existence. The light (6-in.) howitzers were available in sufficient numbers, though many of them would need to be converted to take a lighter shell. Towards the desired number of medium howitzers there were understood to be 18 10/9-in. R.M.L. guns which could be used, while the 17 9·2-in. howitzers (16 being on order) would also fall into this class. With regard to the very heavy howitzers, eight 15-in. howitzers, firing 1,000-lb. shell, were, it was understood, about to be ordered by the Admiralty, and these might be adopted for land service.

Additional guns would be required as well as the howitzers, ranging from 9·2 in. guns on railway mountings to 60-pdrs. Anti-aircraft guns also "would be most valuable, and as many as possible should be supplied," as well as "light armament for use in trenches,"[4] together with dial sights and instruments for the observation of fire, particularly stereoscopic telescopes.

Upon receiving the committee's report, Lord Kitchener immediately authorised the carrying out of the programme laid down. Preliminary estimates were submitted by the Master-General of the Ordnance, which placed the cost at over £3,000,000, and indicated that the outlook for delivery was unpromising. He asked for a further ruling as to "the desirability and necessity of providing on the scale recommended," and hesitated to embark on these big orders until it was definitely clear that the policy outlined was to be adopted. The principal

---

[1] See below, p. 93.

[2] Contracts/G/1624 and 1711.

[3] See above, p. 16.

[4] Such as 10-pdr. or 2·75-in. B.L. guns equipped with overhead and frontal shields.

difficulties were the uncertainty of the period required for delivery, not only of guns but still more of ammunition, which was likely to lag behind the guns. "All the manufacturers of big shell are busily engaged in supplying the wants of the Navy as well as ourselves, and it may have to be a matter for the Cabinet to decide whether any of the naval requirements can possibly be delayed in order to give us the ammunition for these siege artillery." On 1 October Lord Kitchener, having ascertained that the French Minister for War thought it very advisable for the British Army to secure such equipment with a view to attacking the fortified positions then being organised by the Germans, gave peremptory instructions for the ordering of all the necessary material "to proceed with all dispatch." Orders were promptly given for 32 12-in. B.L. howitzers and mountings,[1] and the existing order for 16 9·2-in. B.L. howitzers and mountings was doubled.[2]

On the same day (5 October) Messrs. Armstrong and Vickers were each instructed to proceed with 36 60-pdr. complete equipments, an order for 18 having already, in September, been given to the Ordnance Factories.

Subsequent developments with regard to heavy howitzers may be briefly outlined here. In addition to the placing of orders, investigations were made into the possibilities of providing heavy guns immediately, it being understood that G.H.Q. would welcome any long-range weapons which could be provided in anticipation of the output from new orders. Early in October the Chief Superintendent of Ordnance Factories suggested that 9·2-in. guns might be cut down into 12-in. howitzers,[3] and this course was provisionally approved, but on 14 October the Siege Committee recommended the conversion of 6-in. guns into 8-in. howitzers, and at the beginning of November the Ordnance Factories were asked to alter one gun and manufacture a carriage. Subsequently, following a decision of the Siege Committee to use 8-in. howitzers instead of the 10-in./9-in. guns previously contemplated, arrangements were made for the conversion of 23 6-in. guns which were immediately available, without awaiting the completion of the experimental equipment, and in December the Ordnance Factories were instructed to proceed with 12 guns, the trade undertaking the remaining 11.[4] All these converted howitzers had been delivered by May, 1915, and more were put in hand.

By the beginning of 1915 urgent demands were being received from G.H.Q. for long-range weapons to keep down the enemy's artillery fire, and by arrangement with the Admiralty the 15-in. howitzers ordered by the latter, the first of which was proved at the end of 1914, were put into the field as rapidly as possible. Two had been issued to service by the end of February, 1915, one was delivered in March, one in April, and one in June. The first deliveries of 9·2-in. howitzers took place in February, and of 12-in. howitzers in May.[5]

---

[1] Contracts/A/1608 (5/10/14).
[2] Contracts/G/1746 (31/10/14).
[3] Ordnance Board Minutes, 11593.
[4] 75/3/8015, 8019, 8024, 8027, 8037.
[5] HIST. REC./R/1000/73; H/1200/7.

In the autumn of 1914 a design had been called for of a mobile howitzer to replace the 6-in. 30 cwt. The essential requirements for the new howitzer were a range of 10,000 yards and a weight not exceeding that of the 60-pdr. gun. In answer to this demand Messrs. Vickers produced the design of the 6-in. 26 cwt. howitzer, which was approved. The manufacture of one trial equipment was hurried on, and early in February an order for four was given, twelve more being promised in April.[1]

III. Supplies of Ammunition.

(*a*) Stocks available at the Outbreak of War.

During the years immediately preceding the outbreak of war the manufacture of gun ammunition was on the minimum scale of peace requirements. The prescribed war reserves were assumed to be adequate for the purpose of keeping the field army supplied during a short campaign, or until manufacturing resources sufficient for the replacement of wastage could be developed. The actual distribution of these reserves was approximately as follows :—

	Rounds per Gun.			
	With Units.	For Lines of Communication.	Mowatt Stores.	Total.
13-pdr.	546	230	1,124	1,900
18-pdr.	528	250	742	1,520
4·5-in.	280	520	400	1,200
60-pdr.	250	250	500	1,000

The ammunition shown under the head of Mowatt stores, unlike the supplies carried by units or reserved for lines of communication, was not entirely held as filled ammunition, but, as regards three-quarters of the total amount, as empty components, ammunition for columns not formed being held in the form of components.

The amount of ammunition available was, in fact, in the case of the 13-pdr. and 18-pdr. ammunition, somewhat larger than that here indicated, since provision was made for batteries in the Colonies and for unallotted batteries.

The 18-pdr. and 13-pdr. ammunition consisted exclusively of shrapnel. In the case of the 4·5 in. and 60-pdr., approximately one-third of the total consisted of lyddite shell.

[1] Hist. Rec./R/1000/118 ; 94/G/128.

The total supplies of available ammunition on the above basis were as shown in the following statement :—[1]

	Filled	*Empty*	*Total*
18-*pdr. Q.F.*—			
Shrapnel	332,919	213,561	546,480
Additional rounds subsequently received with Divisions from India ..	108,000	—	108,000
13-*pdr. Q.F.*—			
Shrapnel	60,456	34,944	95,400
4·5-*in. Q.F. Howitzer*—			
Shrapnel	64,800	21,600	86,400
Lyddite	32,400	10,800	43.200
60-*pdr. B.L.*—			
Shrapnel	10,500	6,300	16,800
Lyddite	4,500	2,700	7,200
TOTAL—			
Shrapnel	576,675	276,405	853,080
Lyddite	36,900	13,500	50,400
	613,575	289,905	903,480

For the heavy ordnance the following ammunition was immediately available.[2]

6-*in. Howitzer*—	
Lyddite	
Light Shell	800
Heavy ,, ...	18,400
Shrapnel	1,800
	21,000
6-*in. B.L.C. gun*—	
Lyddite	2,400
Shrapnel	5,600
	8,000
6-*in. B.L. Mark VII*—	
Lyddite	1,800

[1] HIST. REC./R/1200.1/3.
[2] Statements by A1 and A2, dated 17 September, 1914 (HIST. REC./R/170/25).

(*b*) The First Shell Orders.

During the first two months of the war large orders were placed for shell for the new types of field guns—13-pdr., 18-pdr. and 60-pdr. guns and 4·5-in. howitzer—and some supplies were also arranged for the older types with which the Territorial Army was equipped—the 15-pdr. and 4·7-in. guns and 5-in. howitzer. Small orders were also given for 6-in. and 9·2-in. lyddite shell, but heavy shell were not ordered on a large scale until October.

During this early period, orders for the various components of a shell were placed separately, and though some firms made fuses and cartridge cases as well as shell bodies, the minor components were as a rule ordered from firms who did not undertake shell cases. The shell were assembled at Woolwich, and the correlation of the supply of components in itself presented a formidable problem. There were, however, a few British firms who had made "complete rounds" of shell before the war, and in the late autumn of 1914 a few orders for complete rounds of 18-pdr. shell were arranged.

On the outbreak of war immediate provision was made for increased output from the Ordnance Factories. Deliveries were still outstanding on orders for 18-pdr. shrapnel given in April 1913 and April 1914, and by the end of August an additional 200,000 of this nature had been promised, as well as 11,000 15-pdr. and 6,000 13-pdr. shell. Orders were also given for 4,600 4·5-in. H.E. and 9,500 shrapnel and for 2,800 60-pdr. shrapnel.

On 5 August, demands were passed to the Contracts Department for the following quantities of shell:—408,000 18-pdr. shrapnel, 12,000 13-pdr. shrapnel, 5,600 60-pdr. shrapnel, 2,400 60-pdr. lyddite, 47,000 4·5-in. shrapnel and 9,400 4·5-in. lyddite. On 11 August, demands were made for 21,800 15-pdr. shrapnel and 20,000 5-in. shrapnel, and on 14 August for 7,800 9·2-in. lyddite or H.E. The original demand for 4·5-in. lyddite was increased on 16 August, those for 15-pdr. and 5-in. shrapnel on 28 August, and for 13-pdr., 4·5-in. and 60-pdr. shrapnel on 1 September.

Tenders were immediately called for from the recognised War Office contractors for shell, and during August and the early part of September the following quantities were ordered:—22,000 13-pdr. shrapnel; 119,800 15-pdr. shrapnel; 620,000 18-pdr. shrapnel; 11,500 60-pdr. shrapnel; 2,400 60-pdr. lyddite; 91,500 4·5-in. shrapnel; 45,400 4·5-in. lyddite or H.E.; 30,000 5-in. howitzer shrapnel; 7,800 9·2-in. H.E.; and 33,770 6-in. lyddite. Orders were also placed for 9·2-in. and 6-in. A.P. shell; 4-in. lyddite or H.E.; 2·75-in. shrapnel; 12 and 14-pdr. lyddite; and 10-pdr. shrapnel.

These orders, which were for the most part due for completion by the end of 1914 or the early months of 1915, were distributed among the following contractors:—Messrs. Firth, Hadfield, Vickers, Armstrong, Watson Laidlaw, Cammell Laird, Beardmore, and the Projectile Company. Of these firms Messrs. Hadfield undertook only 9·2-in. and 6-in. A.P. shell, Messrs. Watson Laidlaw only 5-in. shrapnel,

Messrs. Beardmore only 60-pdr. shrapnel, and Messrs. Firth 9·2-in. and 6-in. A.P., 4·5-in. and 60-pdr. shrapnel; but Messrs. Vickers, Armstrong, Cammell Laird and the Projectile Company each accepted large orders for several different types of shell. Messrs. Armstrong, for instance, undertook 9·2-in. A.P. and H.E., 6-in. lyddite, 5-in. shrapnel, 4·5-in. lyddite, 4-in. lyddite, 60-pdr. lyddite, 18-pdr. shrapnel, 15-pdr. shrapnel and 10-pdr. shrapnel. Their total orders amounted to 415,000 shell, of which 346,700 were light shrapnel shell (below 4-in.), and of their 13 contracts 4 only were due for completion later than March 1915.

This brief review serves to indicate the way in which demands for shell were piled up during the first weeks of the war, necessitating rapid multiplication of orders with the few British firms capable of giving an early output.

At the same time the possibility was not neglected of supplementing the output of these firms by supplies from overseas. On 12 August, 1914, the Bethlehem Steel Company of America offered to supply guns or shell to the War Office, and shortly afterwards a representative of the company, Mr. Schwab, came over to England at Lord Kitchener's request to discuss the matter. Negotiations proceeded for some weeks, and in the middle of October contracts were concluded for 100,000 18-pdr. shrapnel shell and 30,000 4·7-in. shrapnel and 30,000 H.E.[1]

Before this, arrangements had been made for supplies from Canada. At the end of August enquiries had been made as to the possibility of obtaining empty 18-pdr. shrapnel from Canada, or through the Canadian Government from the United States, and on 2 September, as a result of a meeting of manufacturers, an offer to make shell in Canada was cabled to the War Office.[2] On 19 September, a contract for 100,000 18-pdr. shrapnel and 100,000 15-pdr. shrapnel shell was concluded with the Canadian Shell Committee, which had been set up to obtain supplies from the Dominion.[3] The shell were to be without bursting charges or fuses, and delivery was to begin in November and be complete by February, 1915. Towards the end of the year further large contracts were given to Canada for 18-pdr. shrapnel, a proportion being promised in the shape of complete rounds, and later on 18-pdr. H.E. and 4·5-in. H.E. were also ordered, over 10,000,000 shell having been ordered from Canada at the time of the establishment of the Ministry of Munitions.

At the beginning of October, 1914, also, the War Office accepted an offer from India to send home monthly consignments of 13-pdr. and 18-pdr. shrapnel shell. This contribution, though small in quantity, was particularly valuable, for the Indian Ordnance Factories were able to produce complete rounds of shell.[4]

---

[1] Contracts/Firms B/3394, Contracts /S/7022, 6972.
[2] 57/Gen.No./3588.
[3] HIST. REC./H/1142/7.
[4] Contracts/S/16332. 121/Stores/230.

IV. The Supply of Small Arms.

(*a*) Machine Guns.

On the outbreak of war the only machine guns which were available were Maxim and Vickers. Of the former a small number could be produced or converted at the Royal Small Arms Factory, Enfield. The gun was, in fact, obsolescent, but those in service were retained, and spare parts and accessories were produced at Enfield, where a small number of new guns were also made during the first two years of the war.[1] Messrs. Vickers had a monopoly of their type of gun, which could only be made at their Erith works. In August, 1914, the Lewis gun was in process of development, and the Birmingham Small Arms Company were making experimental guns for the Armes Automatiques Lewis, and were contemplating production on a manufacturing scale.

During August and September, 1914, a total of 1,792 guns were ordered from Messrs. Vickers.[2] The first order, dated 11 August, was for 192 guns; the second, on 10 September, for 100, full deliveries on both being due by the end of the year. On 19 September a larger order for 1,000 guns was given. These were to be delivered at the rate of 50 a week, to be completed in April, 1915, and by a further order given on 26 September, this production was to be followed by an output of 500 guns at the same rate, deliveries continuing until June, 1915. In October permission was given the firm to lay down plant for making 50 guns a week for the French Government, provided that the output for the War Office should not thereby be delayed.[3] Proposals for continuation orders were under consideration from December onwards, but no definite arrangement was made until after the establishment of the Ministry of Munitions.[4] Messrs. Vickers were considerably in arrears on their contracts. The first contract for 192 guns was due for completion by 19 November, but 21 guns were then undelivered[5]; their second contract was a fortnight late in completion. At the beginning of June, 1915, 468 guns were overdue on the third contract for 1,000.

With regard to Lewis guns, 10 had been purchased just before the war broke out, and a further 45 were ordered in August for the Air Service.[6] In September supplies were also arranged for the general service. On 5 September telegraphic inquiries were sent by the War Office to the Birmingham Small Arms Company asking them to quote for 100 Lewis guns. The enquiry was referred to the Armes Automatiques Lewis, the number required was verbally amended to 200, and delivery of 100 in October and 100 in November was promised, the manufacture

---

[1] Hist. Rec./H/1122/101.
[2] Contracts/G/1566, 1609, 1669; 94/G/7, 11.
[3] Hist. Rec./R/1000/119.
[4] At the end of May, 1915, a contract was arranged through Messrs. Vickers with an American firm, Messrs. Colt, but was subsequently cancelled in favour of a Russian order.
[5] Contracts/G/1766.
[6] 77/6/4420.

being undertaken by the Birmingham Small Arms Company.[1] Subsequently, orders on a larger scale were arranged. Before the end of 1914 an additional 400 had been promised, and another 400 were ordered in March, 1915, while in May negotiations began for the production of 2,000 guns, a contract for which was placed in June, 1915.[2] In the case of these guns also there was considerable delay in reaching the anticipated rate of delivery. The Birmingham Small Arms Company had hoped to be producing 100 guns a week by May, 1915, but their deliveries during that month averaged only 36 a week.

(*b*) RIFLES.

The sources of supply for rifles at the outbreak of war were three—the Enfield Royal Small Arms Factory, the Birmingham Small Arms Company, and the London Small Arms Company. Instructions were immediately given for the maximum output to be worked up to as rapidly as possible. The full capacity of Enfield was about 3,000 a week. The Birmingham Small Arms Company had just before the war been producing about 700 a week; by working night shifts they hoped, on existing plant, to give a weekly output of nearly 4,000 by December, 1914. The London Small Arms Company had been turning out 250 a week, and they estimated their maximum capacity with night shift at 1,200 a week.

Instructions were at once given to the Birmingham Small Arms Company to increase their plant in order to give an output of 6,000 a week by May, 1915, and shortly afterwards a further expansion was arranged for to give 8,000 a week by July. The London Small Arms Company also undertook to lay down new plant and increase their output to 1,500 a week by January, 1915.[3]

These orders were all for the standard rifle, the R.S.M.L.E. Mark III, sighted for use with Mark VII ammunition. There were also in existence, in the hands of Territorial troops, a number of rifles sighted for Mark VI. ammunition, and in September, 1914, when it was realised that it was necessary at once to increase to the maximum limits the number of service rifles available for the Expeditionary Force, the Birmingham Small Arms Company undertook to convert 150,000 of these to take Mark VII ammunition. The firm had already undertaken to convert 40,000 of the original short rifle, known as M.L.E. Mark I, most of the rifles of this type in existence having already been converted to a pattern known as Mark I***. The supply of rifles to the firm for conversion was never maintained at the full rate,[4] and in April, 1915, the issue of rifles for re-sighting was suspended.

A large expansion in the orders for new rifles took place in the late autumn of 1914, and again in the spring of 1915. Some account of these developments will be given elsewhere.[5]

---

[1] Contracts/G/1634.

[2] Contracts/G/1634, 2303.

[3] HIST. REC./R/1000/119.

[4] In November, 30,000 were diverted to Enfield, as the B.S.A. Co.'s deliveries were in arrears and the rifles were urgently needed to equip troops under orders to proceed to France (Contracts/R/2159).

[5] See below, p. 97.

CHAPTER IV.

SUPPLY POLICY AND ADMINISTRATION, AUGUST TO DECEMBER, 1914.

I. The Cabinet Committee on Munitions.

(*a*) Appointment of the Committee.

The gravity of the whole question of munitions supplies was recognised by the Government at a very early date, and steps were taken to give all possible Ministerial support to the War Office in the discharge of this task. A Cabinet Committee, consisting of :—

The Secretary of State for War (Lord Kitchener),
The Lord Chancellor (Lord Haldane),
The Chancellor of the Exchequer (Mr. Lloyd George).
First Lord of the Admiralty (Mr. Churchill),
The Home Secretary (Mr. McKenna),
The President of the Board of Trade (Mr. Runciman),
The President of the Board of Agriculture (Lord Lucas),

was appointed to supervise the steps taken in regard to munitions supply. This Committee met six times between 12 October and 1 January, and took the initiative in the more important questions of policy and procedure which arose.

In giving some account of the various questions dealt with by the Committee it will be convenient to indicate also the developments which followed their decisions.

(*b*) Meetings of 12 and 13 October : the Supply of Field Guns.

At the first meeting on 12 October the Committee considered the extended provision of guns for the use of the New Armies, and at the suggestion of Mr. Churchill and Mr. Lloyd George decided upon the ordering of 3,000 18-pdr. guns, to be produced before the month of May, 1915. Orders had already been placed for 892 guns, the bulk of which were anticipated to be available by June, 1915. Mr. Lloyd George considered that the armament firms might be called upon to extend their operations by sub-contracting, or that, if necessary, the entire works of large engineering firms should be taken over and converted to munitions production. Representatives of the gun-making firms were summoned, therefore, to attend on the following day.

At the same time a message was despatched to an officer in America, instructing him to ascertain the maximum output which could be secured from firms capable of manufacturing field guns or rifles to a total of 1,500 18-pdr. guns, and half a million rifles. A reply to this enquiry showed that there was little hope of securing additional output from that source before September, 1915.

The campaign thus opened for securing a single type of gun was to be regarded as a test case. Should it be found possible to place orders on the scale indicated and within the period mentioned, other supplies, including shells and fuses, could be secured in like manner.

On 13 October, Sir Frederick Donaldson, Chief Superintendent of Ordnance Factories, Mr. Saxton Noble (Messrs. Armstrong), Sir Trevor Dawson (Messrs. Vickers), Admiral Bacon (Coventry Ordnance Works), and a representative of Messrs. Beardmore, met the Committee. On receiving the Government's promise that the capital required for extension would be found, and that they would be fully compensated for any consequential loss, they undertook to extend their output by every practicable means.

The results of this meeting are indicated below.

Aggregate Orders Before and After the Cabinet Committee's Meetings.

		Before.	*After.*
12-in. How. ..	Vickers	8	8
	Armstrong	24	24
		32	32
9·2-in. How. ..	Vickers	16	32
60-pdr.	Ordnance Factories ..	18	36
	Vickers	36	36
	Armstrong	36	36
		90	108
4·5-in. How. ..	Ordnance Factories ..	30	80
	Coventry Ordnance Wks.	120	300
		150	380
18-pdr.	Ordnance Factories ..	68	168
	Vickers	360	640
	Armstrong	450	700
	Beardmore	Nil.	100
		878	1,608

Deliveries on these orders were in all cases to be completed not later than August, 1915.

Under the auspices of the Cabinet Committee attempts were made to carry still further the promised expansion of output, particularly in the case of 18-pdr. guns. By the end of October, Messrs. Vickers had agreed to undertake a total of 1,010 18-pdrs., and to do their best to produce 1,000 before 1 July, 1915. They would not, however, quote rates of delivery for any guns in excess of the 640 they promised at the conference on 13 October. Messrs. Armstrong promised 850

18-pdr. guns by the end of June, 1915, and a further 150 during July. In the middle of November also a contract was concluded with the Bethlehem Steel Company, of America, for 200 18-pdrs., delivery to be completed by 30 June, 1915.[1] At the end of October, the Coventry Ordnance Works were induced to undertake a further 150 4·5-in. howitzers. They were urged to promise the whole 450 for which they had contracted by the end of June, 1915, but they refused to guarantee more than 300 by that date. No further orders for 18-pdr. guns or 4·5-in. howitzers were given until, at the end of 1914, the continuation of the firms' output on the conclusion of their existing orders was arranged for. These continuation orders arose from a decision early in December to make provision for the equipment of an additional million men over and above the number required for the six New Armies. The position with regard to guns is indicated by the following minute addressed by the Master-General of the Ordnance to the Director of Artillery and the Director of Contracts on 14 December.[2]

> "With reference to further orders for all natures of guns in the Field.
>
> Taking the 18-pdr. first. Including the eight Divisions of Expeditionary Force, two Indian Divisions, the 27th, 28th and 29th [Divisions] and six new Armies, we shall require 2,386 guns. Of these 702 were provided without touching the new orders, leaving 1,684 required out of the 2,478 new orders. Thus there will be 794 spares, just about enough to act as a reserve.
>
> We must now begin to prepare for 7th and subsequent New Armies. I spoke to Secretary of State to-day, he decided that 1,000 more 18-pdr. guns should be legislated for, *i.e.*, the orders should be placed in time for the present manufacture to continue at the rate of production, which will be in force next June. Would you please consider the best means of doing this, not only for 18-pdr. guns but also for the other natures."

Letters were accordingly addressed on 18 December to Messrs. Armstrong and Vickers, the Coventry Ordnance Works and Messrs. Beardmore, enquiring whether they would be willing to continue output of 18-pdr. 4·5-in. and 60-pdr. B.L. equipment after the existing orders had been completed.

Some anxiety was expressed by the Contracts Department as to the possibility of finding additional firms to assist with the necessary work. The Assistant-Director of Artillery reported, however, that there were no other firms capable of undertaking these orders and that the firms already employed were keeping "fairly well" up to date with deliveries. Accordingly on 11 January 1915, telegraphic instructions were sent to Messrs. Armstrong and Vickers to proceed with 450 18-pdr. equipments each, delivery to follow on that of existing orders, while 70 18-pdrs. were also ordered from Messrs. Beardmore and 200 4·5-in. from the Coventry Ordnance Works.

---

[1] A second order for 50 18-pdrs. and 100 13-pdrs. was given to the Bethlehem Company in June, 1915. HIST. REC./H/1141/6.

[2] Contracts/G/2031.

(c) MEETING OF 20 OCTOBER: PROPELLANT SUPPLIES.

At the third meeting of the Cabinet Committee on 20 October, 1914, the question of cordite supplies was discussed. It was reported that on the outbreak of war the Admiralty had instructed the seven regular trade contractors to increase output up to the maximum possible from their existing plant. The rifle cordite plant at the Royal Gunpowder Factory was being extended under orders given in September. Of this increased supply, 1,000 tons due for delivery between November, 1914, and March, 1915, together with deliveries due on pre-war orders, was allocated to the Army. This arrangement had been sanctioned by Mr. Churchill on 14 October on grounds of general policy, since it was recognised that this concession would interfere with the long prepared plans of the Admiralty. After March, 1915, the War Office would have to rely on output from the contemplated extensions at Waltham Abbey and at contractors' works, as the Admiralty claimed the whole of the trade output from existing plant from that date. Negotiations had already been initiated at the War Office with Messrs. Nobel with a view to the erection of a new self-contained and State-aided factory at a cost of £400,000. Sir Frederic Nathan, who had previously served as a superintendent at Waltham Abbey, was present to represent the firm. He was questioned as to the possibility of expediting increase of output from the new factory, the anticipated date being given as September, 1915. He explained that everything possible was being done to expedite the installation of the new plant, but that at best it would require from six to nine months to secure output, a complete unit, including an acid plant, being necessary.

On 26 October, 1914, in view of the unsatisfactory character of the situation, the cordite manufacturers were summoned to a conference with Lord Kitchener. Representatives of Messrs. Nobel's Explosives Company, Chilworth Gunpowder Company, Curtis's and Harvey, the National Explosives Company, the New Explosive Company and Messrs. Kynoch attended—the latter not having been engaged on Government orders for some years prior to the war—and gave undertakings as to the additional output for which they would be responsible, subject to the provision of increased capacity. The Secretary of State undertook to assist in meeting capital expenditure involved in such extensions.

As a result of the above conference all firms were instructed to lay down new plant, and in the case of Messrs. Kynoch two further extensions were subsequently authorised in 1915, the last of these extensions not being expected to fructify before January, 1916.

In view of the steady expansion in the requirements of the two Services, the situation continued to cause anxiety. It was recognised not only that it would be necessary for the Admiralty to erect a national factory, but to arrange for further particular extensions unless the War Office were able to provide additional supplies.

Accordingly, Mr. Churchill, on 15 December, authorised negotiations for further extensions from Messrs. Curtis's and Harvey, Nobel's Explosives Company, the Cotton Powder Company and Messrs.

Nobel's, and a meeting with War Office representatives was held in the First Lord's room on 24 December, 1914.

Four days later Lord Moulton, who was then organising the supply of high explosives,[1] was called into conference in order to prevent the proposed extension of Messrs. Nobel's from interfering with the increased output of high explosives which was being organised by that firm. The matter was further discussed on 1 and 6 January, and on 25 January, 1915, Mr. Churchill gave instructions that proposals should be submitted for the erection of a naval cordite factory, and on 22 February discussed with Lord Moulton the question of unifying production for the two Services. On the same day he wrote to Lord Kitchener suggesting that Lord Moulton should take over propellants of all kinds as well as high explosive: "and let us have a large and guaranteed scheme of action."

On the following day Lord Moulton informed the Master-General of the Ordnance that arrangements had been made for him to take over derelict works at Queen's Ferry, Cheshire, and it was decided on Lord Kitchener's authority that Lord Moulton should do what he could to provide increased output for the Army in addition to naval requirements.

Shortly afterwards the Admiralty appointed Sir Frederic Nathan to advise on naval cordite production, and it was decided early in March to erect a cordite factory for naval supplies at Poole. The raw material for this factory (guncotton) would be temporarily manufactured at Queen's Ferry, and upon Mr. Churchill's authority the Admiralty secured the Queen's Ferry site on 27 March, 1915. It was anticipated that the Poole factory would be in full working order at the beginning of 1916.

In addition to these British supplies orders had been placed with the Hercules Powder Company of the United States of America for an output rising to 500 tons per month from January, 1916. The Japanese Government had promised a small supply from stock in May, 1915, and the Indian Government a small monthly output from April, 1915. An order for nitro-cellulose powder was also placed with an American firm, Messrs. du Pont de Nemours, in order to make good the deficiency in cordite supply, an extended agreement being executed in March, 1915.[2]

(*d*) MEETING OF 21 OCTOBER: THE SUPPLY OF RIFLES.

The Cabinet Committee met for the fourth time on 21 October and discussed the supply of rifles. The Master-General of the Ordnance stated that on the orders already placed 781,000 rifles were promised by 1 July, 1915. The Committee decided that steps should be taken to increase this total by 400,000. The chairman of the Birmingham Small Arms Company, Sir Hallewell Rogers, who was present at the meeting was asked if his increased rate of output could not be accelerated. He replied that the chief difficulty was the shortage of skilled labour required to make fixings, jigs and gauges.

---

[1] See below p. 110.

[2] For further details, see Vol. X, Part IV.

In order to carry out the instructions of the Cabinet Committee, extensions of plant were arranged at Enfield to increase the weekly output to 5,750; the London Small Arms Company were induced to promise an increase from 1,500 to 2,000 a week by June, 1915; Messrs. Vickers, who had been considering the manufacture of rifles before the war and had put forward a new model, were given an order, promising 2,000 a week in July, 1915 and 3,000 in November; and a new firm, the Standard Small Arms Company, was given financial assistance to enable it to start rifle manufacture, promising 1,250 a week in June, 1915.

The largest new orders, however, were those placed in America. An order had already, in September, been given to the Ross Rifle Company of Canada for 100,000 rifles, while early in October inquiries had been made in the United States. In November, agreements were concluded with the Winchester Arms Company and the Remington Arms Union Metallic Cartridge Company for 200,000 rifles each, first deliveries at the rate of 1,000 a day being promised for about July, 1915. A further contract was later arranged with the Winchester Company for an increase of 300 a day from March, 1916; and in February, 1915, the Remington Company received a second order for 200,000, deliveries at the rate of 500 a day to begin in November, 1915. In April, 1915, an order for 1,500,000 was placed with the Remington Arms Company, a separate company organised by the Remington Arms Union Metallic Cartridge Company, first deliveries being promised for February, 1916.

These American orders represented the principal expansion during the first part of 1915. A proposal put forward in March, to extend Enfield to produce 12,000 a week was dropped owing to labour shortage and housing difficulties. The Birmingham Small Arms Company, however, in April, promised an increase of 4,000 a week, bringing their total weekly output up to 12,000.[1]

(*e*) MEETING WITH ARMAMENT FIRMS, 23 OCTOBER: PROPOSALS FOR CO-OPERATION.

At the meeting of the Cabinet Committee on 21 October, it was decided that Lord Kitchener should see representatives of the armament firms and ascertain whether they would be willing to form a committee similar to the Railway Executive Committee, possibly with the addition of members of other engineering firms.

On 23 October the Committee met again and discussed the whole question of the organisation of trade resources. It was reported that representatives of the armament firms had agreed to act as a committee. The question whether the Government should take over the commercial control of the firms was under consideration, but it was decided that for the time being all that was necessary was for the allocation of orders to be arranged by the firms' representative committee, but that prices and finance would be arranged individually and confidentially as hitherto.

---

[1] For further details, see Vol. XI, Part IV.

(*f*) MEETINGS OF 23 DECEMBER AND 1 JANUARY, 1915.

The Committee did not meet again until 23 December. The discussion on that day dealt with the position of Lord Moulton's Committee on High Explosives,[1] the co-ordination of Army and Navy requirements, and the supply of labour. The last point arose in connection with the report of a conference on shell supplies held on 21 December, and the recommendations of the Committee are dealt with below.[2]

The last meeting of the Committee was held on 1 January, to discuss the proposed appointment of Messrs. Morgan as Purchasing Agents in the United States. The terms to be arranged with the firm were provisionally agreed to at this meeting, and a formal agreement was signed on 15 January.[3]

II. The Supply Policy of the War Office.

In the preceding pages an attempt has been made to outline the principal developments connected with the administration of the supply of munitions from the outbreak of war to the end of 1914; to show the kind of difficulties with which the War Office had to contend, as instanced by the supply of small arms ammunition; to describe the steps which were taken to secure supplies of the principal stores upon the outbreak of war, and the subsequent expansion under the auspices of the Cabinet Committee on Munitions. The story is mainly concerned with the supply of guns and ammunition, because the problems raised by the necessity of providing, on an unprecedented scale, artillery and shell of old and new types were the most formidable by which the War Office were faced. Moreover, it was primarily the breakdown of the War Office arrangements for supplying ammunition which led, through the movement for the organisation of local resources, to the establishment of the Ministry of Munitions.

At this point, before proceeding to give some account of the breakdown of supply in the spring of 1915, it will be well to pause and consider in greater detail what was the policy upon which the War Office had acted in regard to the supply of munitions.

(*a*) RELIANCE UPON THE ARMAMENT FIRMS.

It has been seen that during the first two months of the war orders for gun ammunition were placed on a large scale with the armament firms, and supplies from overseas were also arranged.

During this early period, moreover, the Contracts Department of the War Office was inundated with offers of assistance from British firms, and there was a general desire throughout the country that additional firms should be allowed to compete for the privilege of supplying the Army. The eagerness of these applications was naturally accentuated by the extent of dislocation of normal industry

[1] See below, p. 110.
[2] See below, p. 125.
[3] For details of the Morgan Agreement, see Vol. II, Part III.

caused by the outbreak of war. The War Department was very ready to utilise such assistance, with the proviso that the firms were competent to satisfy the normal contract conditions; in other words, that they were prepared to tender on equal terms with the expert armament firms. Firms whose equipment was not adequate for the production of complete munitions in the normal way could thus not obtain direct contracts for any of the more important types of munitions. They were, therefore, virtually restricted either to the supply of subsidiary munitions and accessories or to sub-contracting for the firms able to undertake the principal contracts.

In October, when the Cabinet Committee in considering the question of munitions supply decided on a large expansion of gun orders, it became clear that an enormous extension of the shell manufacturing capacity of the country would be required, and that this extended demand would involve the mobilisation of a large number of firms which had not hitherto had experience of munitions production, and which would require assistance, not only with equipment and buildings, but still more with technical advice and supervision.

How was this supervision to be secured? There was at that time a small expert staff under the Chief Inspector at Woolwich fully competent to advise on manufacturing requirements, but this staff was already overwhelmed in the endeavour to cope with its immediate work in connection with output from existing sources. The Chief Superintendent of Ordnance Factories equally found his staff overburdened with current production, and the most that he could undertake was to facilitate visits of inspection by representatives of contracting firms.

It was thus decided to adopt the policy of utilising the resources and knowledge of the armament firms themselves to the uttermost, and to rely upon them to arrange for the allocation of work among inexperienced firms, and for the consequent co-ordination in the flow of the products of manufacture, and thus to decentralise a task which threatened to overwhelm the capacity of the War Office or the Royal Ordnance Factories.

> "It was decided that in the first instance it was best to place orders with the usual armament firms to the extent of which their managers thought they were capable. It was most necessary, especially in connection with the fuses, that the requisite supervising staff with its experience should be not only fully utilised, but utilised to the best advantage. The system more or less followed was to take the most difficult component, viz. the fuse, first, and when orders had been placed for the fuses, then orders to balance up the remaining components were entered into. The full output of the armament firms having been taken up, further orders were given for such components of ammunition to such other firms as had works which were considered capable of undertaking them and financial assistance was given them for providing necessary plant.
>
> "The necessity of organising all the trade resources for supplying our wants was fully recognised at this period, but it was considered that instead of attempting to organise centrally from

the War Office it was much better that the main orders should be given to the Ordnance Factories and the large armament firms, and that they should themselves organise and expand to supplement what they could do with existing buildings and machinery."[1]

The policy of relying upon the armament firms in the matter of expanded output was not adopted without deliberation. A Cabinet mission was sent to France to enquire into the measures adopted for the organisation of private industry in that country for the manufacture of gun ammunition and artillery. On 18 October, Mr. Lloyd George, Sir John Simon and Lord Reading conferred with General St. Clair Deville, the inventor of the 75-mm. gun, and Captain Cambefort, a Lyons manufacturer. It was found that the French had been enabled to extend production among private firms by reason of their extensive initial resources in the possession of numerous arsenals and technical personnel. The plan which had been adopted at the end of September was to divide France into districts, each under the direction of a prominent engineering employer. The district undertook a contract collectively, and the work was distributed among the firms according to their capacity. By the middle of October some private firms were already turning out shell, and a rapid increase of production was expected. These developments afforded a valuable and suggestive example of the expansion of output that might be secured by decentralised organisation. The lead thus given was of importance as stimulating the movement for local area organisation. The weight of expert opinion was, however, unfavourable at this time, on the ground that the established armament manufacturers alone possessed the requisite technical capacity, and that the introduction of new firms could best be achieved under their tutelage by means of sub-contracts. Thus the project was suffered to remain in abeyance until the beginning of 1915.

On 21 April, 1915,[2] Mr. Lloyd George describing the results of this investigation, said :—

"At the beginning of October the problem was realised by France as well as by ourselves. . . We had a committee to consider what should be done to extend our machinery for the purpose of turning out cannon, rifles, and ammunition. I had a report from France of what had been done there. That report was presented to the War Office, and there was a committee appointed to organise the resources of this country to the best of their ability.

"The experts advised that the best method of doing that was, in the first instance, to extend sub-contracting. That was the experts' opinion, as it was undoubtedly the opinion of the armament firms, and I think they gave a perfectly honest opinion. I do not believe they were doing it merely in their own interests. There was a good deal to be said for that view, because it is highly technical work, it is very difficult work, and it is skilled work.

---

[1] Memorandum by the Master-General of the Ordnance (HIST. REC./R/1000/No. 119, p. 8).

[2] *Parliamentary Debates* (1915), *H. of C.*, LXXI, 315.

> Although there are no better engineers in the world than you have in this country, these firms were without any experience at all of the kind of work the War Office required to be done. So it was thought better that the armament firms, who had got men accustomed to this class of work, should parcel out, as it were, the parts of the work which could be done even by inexperienced firms, leaving to themselves the more difficult and more delicate work, and also leaving to themselves the putting together of the various parts."

The policy adopted by the War Office thus falls under two heads :— (1) the expansion of the regular armament work by means of subsidies granted by the Government ; and (2) the extension of the usual system by which the chief armament contractors gave sub-contracts for single parts or processes to ordinary engineering firms.

(*b*) Subsidised Expansion of Armament Works.

Some idea of the nature of the demand made upon the armament firms, and of the successive stages by which that demand was increased, can be gained from a study of the early orders for a single nature of shell—the 18-pdr.—placed with one of the principal firms, Messrs. Armstrong, Whitworth.

At the outbreak of war, a contract for 18-pdr. shrapnel shell had just been placed with this firm (31 July, 1914). Their first war order was placed on 18 August, and was for 162,000 shrapnel shell. This was superseded on 30 August by a contract for 300,000 shell,[1] earlier orders for cartridge cases and No. 80 fuses being correspondingly increased.[2] The weekly output was to work up to 15,000 by December, 1914, and the whole quantity was due for delivery by March, 1915. In October, the Assistant Director of Artillery made verbal arrangements with the firm to proceed with a further 400,000 shell, cartridge cases and fuses, for delivery on completion of the earlier order. The weekly output of 15,000 already promised was to be increased to 35,000 by March, the contract being due for completion in May. The contract[3] for 400,000 shell was signed on 10 November, and on the same day the firm were instructed to continue deliveries at the maximum rate (35,000 a week) on the conclusion of their contracts in May.[4] Four days later, as the result of further communications with the Master-General of the Ordnance, Messrs. Armstrong agreed to increase their weekly output to 55,000 within four months. At the end of November they were instructed to divide the output into 42,500 shrapnel, with No. 80 fuse, making an increase of 7,500 a week[5] over the earlier contracts, and 12,500 H.E. The fuse first ordered for the H.E. shell was the No.80/44, but this was replaced early in 1915 by the No. 100 graze fuse. The whole output

---

[1] Contracts/S/6507.
[2] Contracts/C/8050 and Contracts/F/2288.
[3] Contracts/S/7007.
[4] 57/S/4441.
[5] No deliveries of shrapnel were made on this contract (Contracts/S/7436) nor on a contract for a further 20,000 a week arranged in January (Contracts/S/7777).

of 55,000 a week was to be in the form of completed rounds, the War Office supplying the H.E.[1] In December, the firm was instructed to continue manufacture at the rate of 12,500 H.E. shell a week, until three months' notice to discontinue was given, and in May a contract was placed for an additional 30,000 a week[2], bringing the weekly total of H.E. up to 42,500. The first instalment on this last contract was expected at the beginning of June. In May, also, it was arranged that 150,000 H.E. shell should be substituted for an equal quantity of shrapnel, which was in arrears, and the War Office agreed to the firm's sub-letting a contract for the number in question to the Pennsylvania Steel Company.[3]

Obviously, expansion of output on this scale could only be obtained by laying down new plant, and even in the earliest orders, some allowance was usually made in the prices quoted on account of extensions. In Messrs. Armstrong's order of 18 August mentioned above, for instance, the price quoted per shell (17s. 6d.) included 2s. for new plant.

In October, 1914, the War Office invited the armament firms to submit proposals for increasing their output by extending their plant. Under an arrangement with the Treasury, financial assistance was promised to enable them to carry out approved extensions. Most of the firms engaged in the manufacture of ammunition, explosives, guns, and small arms submitted schemes and received grants to cover the expenditure. Attempts were made to induce the firms to borrow the money for these extensions from the Government; but at the outset most of the armament firms refused to consider any repayment of the capital advanced, and the grants were, in effect, gifts to the contractors. These arrangements constituted the earliest type of "assisted contract."

The first plant subsidies were paid to the shell-making firms in November, 1914, and subsidies for increased plant for guns, rifles, and small arms ammunition followed in quick succession.

(*c*) Sub-contracting.

It has been said that offers of assistance in munitions manufacture were made to the War Office from the very beginning of the war. The list of new firms asking for orders grew rapidly; during August and September, 1914, 70 applications were received for work on shell, 54 for shell parts, 38 for fuses or parts, 13 for cartridge cases, 13 for gun parts, 12 for gun mountings, 7 for parts of gun mountings, 4 for machine guns or parts, 4 for rifles and 4 for rifle parts.

The greater number of the applicants, however, could only offer to undertake work of a limited character. In accordance with the general policy such firms as could not undertake direct contracts were encouraged to accept subcontracts from the principal contractors.

---

[1] The contract for assembling 42,500 rounds of shrapnel and an equal quantity of H.E. was not signed until 21 May, 1915 (Contracts/Firms A/1797).

[2] 94/S/404.

[3] 57/3/4579.

In order to put the armament firms in touch with possible sub-contractors when tenders for a particular munition were invited, a list of firms who had applied for work that might be useful in the production of that munition was issued with the tender forms. The utility of these lists would have been greater, if a larger and more technical staff could have been employed in drawing them up. The Board of Trade helped by inspecting firms and reporting on the capabilities of their plant; but the staff available for this work were too ignorant of the technicalities of munitions manufacture for their reports to be of much value.

As an example of this procedure reference may be made to invitations to tender[1] which were sent to 37 firms on 19 October, 1914, for shells of various types (4,500 common lyddite 12-pdr. and 14-pdr. Q.F., 300 common lyddite 4-in. Q.F., 2,350 H.E. heavy 9·2-in. gun B.L., 1,300 common lyddite light 9·2-in. gun B.L., 19,750 common lyddite 6-in. gun B.L. or Q.F.). The only tenders received were from six regular armament contractors. With the tender form was circulated a list of 129 firms who had offered their services to the War Department for the supply of parts of shells or for carrying out some of the processes of manufacture.

The usual method of sub-contracting was thus that armament firms sub-let the making of parts to new firms, and themselves assembled the parts and finished the article. Less often the armament firms sub-let the whole contract for the complete article. There is no doubt, however, that this practice led to abuses, and unfair profits were made in some cases through firms taking advantage of the ignorance of new makers. In one instance, a case came to light in which a whole contract had been sub-let at a much lower price than that paid to the main contractor, and a large sum thus was obtained for teaching a new firm what was only a simple job.[2] Such an abuse might have been checked earlier if a more adequate liaison system had existed between the Inspection Staff and the Contracts Branch.

The variety of the work undertaken by sub-contractors is illustrated by a list of sub-contractors for War Office contracts drawn up in July, 1915, by one of the smaller armament firms (Messrs. Firth), who were then employing sub-contractors as follows:—Steel, 3 firms; punching and drawing, 2; machining, 17; copper bands and tubes for same, 8; nose bushes and metal for same, 5; shrapnel components (discs, bullets, tin cups, felt washers, heads, screws, metal tubes, sockets), 13.[3]

Similar endeavours to extend the area of supply by means of sub-contracts during the autumn months were made by the Royal Ordnance Factories, the general policy being to place out with sub-contractors the simpler portions of manufacture involved in the production of supplies for which they were responsible.[4]

---

[1] Contracts/S/7129 with 94/S/994. [2] HIST. REC. H/500/10.
[3] 94/S/659.
[4] *e.g.*, invitations to tender for machining 60-pdr. shrapnel and making 15-pdr. H.E. shell were issued on 18 November to a number of important firms (Contracts/S/7588 with 94/S/2870).

(*d*) Spreading of Contracts.

So far we have considered sub-contracting in regard to the production of gun ammunition components only, this being the field in which there was the greatest room for multiplication of production and that which presented the fullest scope for firms of ordinary engineering capacity and experience. It was not to be expected that the same degree of success would attend the efforts to extend sub-contracting in directions which were less favourable. In the case of gun manufacture, for example, which necessarily involved very special plant and great technical difficulties as regards control of forging operations required for the manufacture of gun bodies, and no less difficulty and delicacy in the engineering work for the manufacture of breech mechanisms, sub-contracting could not readily be carried on to any great extent.

Nevertheless, endeavours were made to this end. The possibility of field artillery being manufactured by outside firms was raised by the President of the Board of Trade in an interview with Mr. Morcom, of Messrs. Belliss & Morcom on 14 October, 1914.[1] The number mentioned was about 1,200 18-pdr. guns. Mr. Morcom suggested that the British Electrical and Allied Manufacturers' Association might render collective assistance. At a meeting of the Council of this Association on 15 October all the members present expressed their willingness, but they were doubtful if the work were not of too special a character. An Emergency Committee was appointed. Mr. Morcom, accompanied by several engineers, visited Woolwich on 16 October. He reported on the 21st to Mr. Runciman that the Association could do the work, but it would need close organisation, considerable assistance from steel works, machine tool makers, gaugemakers, and ordnance experts. He proposed the formation of a committee, representing the principal trades involved and the ordnance experts, which he thought might be a good agency for distributing the orders for emergency work and securing the assistance of the less-known firms.

Mr. Alfred Herbert and Mr. Dumas (British Thomson-Houston Company, Rugby), who had also been consulted, were opposed to the project, and considered that all that a committee could usefully accomplish would be the development and co-ordination of the resources of private firms to assist the armament companies. Sir Frederick Donaldson held the same opinion. The proposal was dropped, and the matter ended in a list of fourteen firms belonging to the Association being sent to the Arsenal. A number of these firms undertook work for Woolwich and for the armament firms.

The highly technical character of gun manufacture would certainly have presented very serious difficulties to any experiments in production by untried firms. There was a strong case for meeting the fresh demands by expanding the resources of the regular makers. Considerable subsidies were granted to Messrs. Armstrong, Messrs. Beardmore, the Coventry Ordnance Works, and Messrs. Vickers.

---

[1] Hist. Rec./H/1121/1.

Similar difficulties did not, of course, apply in the case of gun carriages and vehicles. From the first weeks of the war the Chief Superintendent of Ordnance Factories drew largely on the resources of private firms for assistance in this respect, and the expansion of output which he promised in October was conditional on this assistance being continued.

Work of Railway Companies.

The railway companies in particular were utilised by the Royal Ordnance Factories in this way, and special mention should be made of their munitions work. The companies were approached by the Factories shortly after the outbreak of war for assistance in various work: their help was asked, for instance, in the manufacture of carriages for 4·5-in. howitzers ordered from the Ordnance Factories on 13 August, and a few months later it was proposed that they should make the carriages for certain 6-in. guns which the Ordnance Factories were to convert to 8-in. howitzers. They also, at the request of the War Office, took up the manufacture of shell components and of shell, being asked to associate themselves particularly with the manufacture of 6-in. H.E. shell.

On the first request for assistance from Woolwich, the Railway Executive Committee appointed a sub-committee to consider the matter. This sub-committee was later enlarged to include representatives of the principal railway companies, the War Office, and ultimately of the Ministry of Munitions and the Admiralty, and, as the Railway War Manufactures Sub-Committee, continued throughout the war to deal with applications for assistance from the Government in munitions work.[1]

In addition to the work undertaken directly for the Government, the railway companies sub-contracted to a large extent to munition making firms. In the autumn of 1914, for instance, the North Eastern Railway Company undertook the manufacture of 18-pdr. shell for Messrs. Armstrong, and erected a building for the purpose adjacent to their works at Darlington.[2] In other cases large quantities of shell components were supplied to War Office contractors. To assist these activities, sub-committees of the Railway War Manufactures Sub-Committee were appointed in various areas.

In the case of these sub-contracts to firms, precautions had to be taken against the main contractor buying at a low rate from the railway companies, which were financed by the Government, and making an undue profit by selling to the Government. The financial arrangements agreed to between the War Office and the Railway Executive Committee[3] accordingly provided that

> "so far as practicable work done by a Railway Company as sub-contractor to a firm holding a contract at fixed prices with the

---

[1] Sec./Gen./2028.

[2] This factory was subsequently transferred to the direct control of the Government and was classed as a National Projectile Factory.

[3] As embodied in a memorandum drawn up in June, 1915 (94/Gen. No./312).

Government, will be excluded from the contract of the Government with the firm.

" Where this is not possible, Railway Companies will assess their charges on the basis fixed for direct work for the Government, and will add a further charge of 10 per cent. to the cost of the work as profit. This percentage, as in the case of the shop costs and supervision charges, will be credited to the revenue account."

The " basis fixed for direct work for the Government " was that charges should be made up as follows :—

(i) *Materials* : if bought specially, at cost price plus usual charges for carriage and handling ; if used out of stock, at replacement prices plus usual charges for carriage and handling.
(ii) *Labour* : at cost price.
(iii) *Workshop Expenses* : as usual in the shop.
(iv) *Supervision and Establishment charges* : calculated at 12½ per cent. on the total of (i), (ii) and (iii).

Search for New Contractors.

It has already been said that as early as the beginning of September, 1914, tender forms for some of the simpler natures of shell had been issued to engineering firms who had never before made complete shell. It was, however, practically impossible for such firms, even if they could obtain drawings and specifications without delay, to prepare estimates of the probable cost of manufacture within the few days that were customarily allowed before tenders had to be sent in. Consequently, it not infrequently happened that the only tenders received were from armament firms, and even where new firms could formulate an offer, the contract usually went to an experienced contractor who was able to quote lower prices and earlier deliveries.

For instance, on 6 September, invitations were issued to a number of firms to tender for the supply of 5,600 60-pdr. shrapnel shell, 12,000 13-pdr. shrapnel and 34,500 4·5-in. shrapnel. Twelve of the firms communicated with made no tender ; 7, of whom 5 were armament firms, tendered for the 60-pdr. ; 8 (6 armament firms) for the 13-pdr. ; and 8 (6 armament firms) for the 4·5-in. The new firms who tendered were Messrs. J. & P. Hill, Messrs. Rolls Royce, and the James Cycle Company, and none of them received a contract, orders for 60-pdrs. being given to Messrs. Beardmore and Messrs. Firth, for 13-pdr. to the Projectile Company and Messrs. Vickers, and for 4·5-in. to the Projectile Company, Messrs. Vickers and Messrs. Firth.[1]

The endeavours of the Contracts Branch to discover new sources of supply were severely handicapped by the difficulty of giving applicants ready access to samples, drawings and specifications. The branch had no sample room of its own ; firms had to be sent to the inadequate sample room at Woolwich, where no one knew which of the articles were most required. Drawings and specifications were issued only by Woolwich on the request of the Contracts Branch,

[1] Contracts/S/6724 (94/S/51).

and then after considerable delay. The stock of copies was insufficient. These obstacles discouraged many firms who might have been useful.

As the result, however, of the efforts to extend sub-contracting which have been described above, a considerable number of firms of ordinary engineering capacity were able to acquire experience of shell manufacture and in certain instances subsequently developed into contractors on a large scale. In other cases the growth of the miscellaneous demands of the Army enabled firms to obtain work more in accordance with their normal industrial activities. This may be illustrated by the following list of orders placed with certain firms who, in March, 1915, were stated to have recently informed the Contracts Branch of the War Office that they were open to receive orders for various kinds of engineering and machine work. Of the total of 50 firms, 21 received no direct orders from the War Office or Ministry of Munitions. Four had already received orders, one for pull-throughs, rifle parts and cleaning rods, one (the Austin Motor Company) for shell, one for oil bottles and pull-throughs, and one for optical instruments. During the remainder of 1915 nine more received contracts, of whom one undertook 4·5-in. H.E. shell, four shell components (adapters, plugs or gaines), one small petrol bombs, one aeroplane bombs, and one rifle components. In 1916 contracts were placed with fourteen more, two undertaking shell, seven shell components, one petrol engines, one Temple silencers for trench howitzers, one acetylene generators, one hauling chains, and one director stands. One more firm on the list was given an order in 1917 for explosives machinery, and one in 1918 for A tubes for 18-pdr. guns.

Up to the end of 1914 the direct contracts for shell placed by the War Office with new firms were few in number. In October a contract was arranged with Messrs. Dick Kerr, and in November with Messrs. J. & P. Hill, for 6-in. H.E. shell, and Messrs. Hill also undertook 4·7-in. H.E. On 26 December, the Rees Roturbo Manufacturing Company, who, as has already been mentioned, were represented at the shell conference on 23 December, received the first contract which was placed for 8-in. shell. This firm subsequently developed a large capacity for shell making, and some details of the negotiations with them may be given, as an illustration of the conditions under which new firms undertook shell manufacture.

On 17 November, Messrs. Rees Roturbo wrote informing the War Office that they were "seriously contemplating the installation of a plant for the manufacture of the larger sized projectiles." An interview was arranged with a representative of the firm, Mr. Brindley, who stated that he had himself acquired experience of shell manufacture in Messrs. Firth's works at Sheffield, and that he had designed various types of presses. The firm were considering putting down plant at an expenditure of £5–6,000, the output contemplated being 2,500 6 in. shell a week. Mr. Brindley was asked to consult his directors also on the subject of 8 in. and 9·2 in. shell, and at the end of November, having found that additional plant and tools would be required, he submitted a revised estimate of expenditure in this respect (£11,800) for an output of 2,000 a week of 6 in. shell or other sizes *pro rata*.

During the first week of December there was further discussion as to prices and the terms of a War Office loan, and on 7 December the firm were instructed to proceed with the erection of plant for 8 in. shell, delivery of which would begin in March at 600 a week and continue subject to three months' notice. The alternative manufacture of 6 in. or 9·2 in. was still under consideration.

Before the end of the month, the situation was altered by the acquisition by the firm at a cost of £10,000 of premises at Ponder's End, containing powerful hydraulic presses. They were thus able to offer an increased output, but they required financing in respect of the necessary purchases of steel, which was already rapidly rising in value. New proposals were accordingly discussed by the Master-General of the Ordnance with Sir George Gibb, Colonel Bingham and Mr. Hanson, and it was agreed that the War Office should advance capital sums for expenditure on works and provision of plant up to 80 per cent. of expenditure incurred, but not exceeding £80,000; while a further capital sum of £137,000, to be advanced for the provision of materials[1] and wages, was to be recoverable by the deduction of 50 per cent. from payments for shell. The deliveries now promised were 600 8 in. a week from the middle of March, and 600 6 in. from the middle of April, both rising to 3,000 by the middle of June and continuing at that rate till notice to terminate was given. The Secretary of State, however, reserved the right to instruct the company to change over from 8 in. to 9·2 in. at two months' notice. The price of the shell, £9 15s. for 8 in. and £4 8s. 6d. for 6 in., was to be reduced to £9 3s. 4d. and £4 2s. 6d. for shell delivered after 1 July, 1915. A contract embodying these terms was signed on 26 December: it was modified in April to provide that, since the firm had experienced great difficulty in obtaining plant, notice to discontinue should not be given before 31 July.

Messrs. Dick Kerr, J. and P. Hill and the Rees Roturbo Company remained, until the establishment of the Ministry of Munitions, the only contractors outside the armament group to make heavy shell, but orders for H.E. shell of the lighter types were more widely distributed. During the first five months of 1915 orders for 4·5 in. H.E. shell were given to Messrs. Dick Kerr and Messrs. Harper Sons and Bean, the latter also undertaking 4·5 in. shrapnel. New contractors for 18-pdr. H.E. included the Austin Motor Company and Messrs. Dorman Long in February, the Ebbw Vale Steel Iron and Coal Company in March and Messrs. Craven Brothers in May.

(*e*) The Beginnings of the Control of Industry.

At the conference with gun makers on 13 October, the Cabinet Committee authorised the Chief Superintendent of Ordnance Factories, to take whatever steps were necessary to secure an additional output

[1] In January, 1915, in view of the increased price of steel, the company asked for compensation for actual increase above a basis price of £20 per ton, and this was agreed to subject to its not becoming operative until after delivery of 24,000 6-in. and 42,000 8-in. shells.

of 100 18-pdr. complete equipments, 50 4·5 in. howitzer equipments and 18 60-pdrs. On the following day the Chief Superintendent communicated to the Master-General of the Ordnance his requirements in regard to labour,[1] machinery,[2] and assistance from outside sources.[3]

With regard to this last point he wrote :—

> " As regards the work which it is hoped to get done by private firms, I may have to ask for powers to oblige firms who undertake work to give absolute preference to our orders over those of any other clients, and of course in saying this I contemplate that the firms so employed would not be otherwise engaged on War Department or Admiralty work, or at any rate that any other War Department or Admiralty work would not suffer. On both these points I should like to be assured of official approval and support."

The question of compelling firms to give preference to War Department orders over those of private clients, which subsequently became the basis of the elaborate system of control known as priority regulation, here makes its appearance for the first time. The suggestion was referred to the War Office Secretariat in order to ascertain whether there was power to enforce such control. The view taken was that " the legal question had better not be raised. This course has been taken with regard to firms making motor lorries, and there is no doubt as to the powers of the Government to give such orders and to enforce them."[4] The Chief Superintendent of Ordnance Factories was accordingly informed that action on these lines would receive official support. No further steps were, however, taken immediately, but in November the question of the powers of the Government in relation to industry was raised again, this time from the point of view of the supply of high explosives.

High explosives were not manufactured at the Royal Gunpowder Factory, and it had been the practice of the War Office to rely upon the trade supply for picric acid. The same procedure was at first adopted in regard to trinitrotoluene (T.N.T.), but in the month of October it became apparent that an adequate output of trinitrotoluene would not be obtainable from this source.

On 10 November, 1914, the Board of Trade was invited to co-operate, and Lord Moulton's Committee on High Explosives was constituted on 16 November, to advise as to the methods which should be adopted to secure an adequate supply of the products in question. The line of action to be followed was formulated in a memorandum[5] drawn up by Lord Moulton towards the end of the month, in which he revealed the alternative sources of supply and indicated the policy to be followed :—

> " The plan of action set out in this Memorandum is based on the principle that, at all events, for some weeks, if not months, the policy to be pursued is to develop in every practicable way the production in England of high explosives suitable for use in warfare. The enormous expenditure of such explosives on the

---

[1] See below, p. 123.
[2] See below, p. 125.
[3] 73/Gen. No./1561.
[4] 24/10/14 (Contracts 1130).
[5] Memorandum dated 27 November, 1914.

part of our foes since hostilities began, has shown that no calculations of the quantities required can be based on the experience of previous wars. The only safe line of action, therefore, is to develop the production of these explosives to the utmost in every direction until the danger of a shortage is removed. . . .

"The conclusion is, therefore, that for the moment we ought not to think of working to specific needs, but to aim at developing our productive power in high explosives to the greatest possible extent. Even this will, unfortunately, not be adequate to prevent the possibility of shortage until many weeks, and perhaps several months, have passed, but much can be done in that time."

In the first place it was necessary to face the prospective shortage in the supply of trinitrotoluene. It was evident that the view adopted shortly after the outbreak of war, that this explosive alone could be relied upon to satisfy all requirements, must be abandoned. All available supplies of picric acid (lyddite) must also be stimulated in every practicable way. The fundamental difference between picric acid and trinitrotoluene was the strict limitation on the supply of the raw material (toluene) for the latter. In the case of lyddite, there was no similar limitation upon the quantity of raw material, phenol, which could be obtained by synthetic process from benzene or some derivative of that substance. The primary question was, therefore, to secure for the Government the whole of the toluene produced in the country, and arrange for its conversion into trinitrotoluene without leakage. This would involve the control of gas undertakings and coke oven undertakings having recovery plant for the distillation of toluene from tar.

On 20 November, Lord Moulton's Committee decided that special powers should be asked for in order to carry out these proposals, since it would be necessary to requisition both stocks and output of toluol. It would also be necessary to supervise closely the manufacture of these essential supplies and dealings therein. The urgency of this need was recognised, and steps were taken to give effect to the committee's wishes by means of an amendment to the Defence of the Realm Act, then under consideration in Parliament.

The primary purpose of this enactment was to strengthen and codify the powers already granted by Parliament under the Defence of the Realm Act and the Defence of the Realm (No. 2) Act, passed on 8 and 28 August respectively, and the regulations instituted therein. The former Act gave power to make regulations to prevent communication with the enemy and for the better security of means of communication—railways, docks, and harbours. The latter Statute had extended this authority to cover the spreading of reports likely to cause disaffection, and had given power to deal with areas in which troops were concentrated, or to suspend restrictions on acquisition or user of land.

The new Statute gave wide powers for the making of regulations for these various purposes, or "otherwise to prevent assistance being given to the enemy, or the successful prosecution of the war being endangered."

The Bill was introduced on 23 November, 1914. In order to deal with the difficulty above indicated, the addition of the following clause was proposed by Mr. McKenna during the Committee stage on 25 November :—

" (*a*) To require that there shall be placed at their disposal the whole or any part of the output of any factory or workshop in which arms, ammunition, or warlike stores or equipment, or any articles required for the production thereof, are manufactured ;

" (*b*) To take possession and use for the purpose of His Majesty's Naval or Military Service, any such factory or workshop, or any plant thereof, and Regulations under this Act may be made accordingly."[1]

The purpose of the clause, as announced by Mr. McKenna, was " to secure that the Government can obtain the highest maximum possible output of the factories or workshops in which arms, ammunition, warlike stores, or equipment, are manufactured. I am sure that the Committee will agree that it is most desirable that every step should be taken which will assist the Government in securing as abundant a supply of arms and ammunition as the country is capable of producing."[2]

On the following day, Mr. Harold Baker, the Financial Secretary to the War Office, described[3] the object more specifically as intended to give the War Office full authority to acquire supplies from contractors :—" What we have done is to take powers under the Defence of the Realm Act yesterday to commandeer at a fair price the whole of the output of any factory, or, in a further stage of necessity, to take over that factory and work it ourselves. We have taken that step in order to secure the power of applying a check to any tendency to squeeze the War Office by charging excessive prices."

The Act received the Royal Assent on 27 November, 1914, and the powers conferred by it were immediately put into effect, in connection with the supply of explosives. On 28 November, the War Office took over the Rainham Chemical Works from the Synthetic Products Company, the works being utilised for the purification of crude T.N.T. Messrs. Coley and Wilbraham were placed in control[4] of the factory, as the agents of the Government. On 25 and 27 November, circulars had been issued by the Director of Army Contracts to certain coal tar producers, notifying them of the Government's intention to requisition stocks of toluol, and on 3 December, a further circular to all coal tar producers and distillers informed them that they were required to place at the disposal of the Government, for the period of the war, their whole output of toluol, or substances containing toluol.[5]

---

[1] *Parliamentary Debates* (1914), *H. of C.*, LXVIII, 1274.
[2] *Ibid.*, 1275.
[3] *Ibid.*, 1449.
[4] Vol. VIII, Part II, p. 75.
[5] Vol. VII, Part IV, pp. 13 and 89. An account of the work done by Lord Moulton's Committee on High Explosives will be found in Vol. X, Part IV.

CHAPTER V.

THE NEED FOR REINFORCEMENT OF THE SUPPLY ORGANISATION.

I. The Shell Conference, 21 December, 1914.

The increases in the gun programme in October, 1914, involved a corresponding expansion in supplies of shell. It has been seen that only a few experimental orders had been given to untried contractors before the end of 1914, and it follows that heavy demands had to be made on the armament firms, not only for field gun ammunition, but also for shell for the heavy howitzers ordered in accordance with the Siege Committee's recommendations.

This expansion in the volume of their orders of course greatly aggravated the difficulties of the task undertaken by the armament firms. Not only had they now, at the urgent instruction of the Government, undertaken to expand to its utmost limits the existing and potential capacity of their respective works, but the discharge of their undertaking was conditional upon the successful negotiation and supervision of sub-contracts with inexperienced firms. This latter fact did, as the sequel showed, introduce a factor of uncertainty which was, perhaps, the principal cause of the failure to deliver within the contract time, and rendered unreliable the best estimates which the armament firms could frame, based upon a knowledge of their own resources.

Similar efforts were made at this period to increase the output of the Ordnance Factories and to expand the volume of contracts placed overseas. Orders placed with the Shell Committee at Ottawa were increased to a very large total, and on 14 October the first large American contract was placed, an order being given to the Bethlehem Steel Company for 1,000,000 complete rounds of 18-pdr. shrapnel ammunition, the contract being based on an agreement arrived at on 28 October.

By the end of the year the total orders for shell had reached a figure of ten millions, distributed as follows :—

Ordnance factories	812,000
Armament firms	6,210,000
American firms	1,280,000
Canadian Shell Committee	1,700,000
Indian Government	52,000
	10,054,000

A comparison of the orders for the principal natures of field artillery included in this aggregate with the total reserves on hand at the

outbreak of war gives some measure of the new scale of supplies which contract negotiators had now to envisage :—

	Stocks at Outbreak of War.	*Total Ordered 31.12.14.*
18-pdr.—Shrapnel..	654,480 ..	6,580,923
H.E. ..	— ..	758,000
13-pdr.—Shrapnel..	95,400 ..	283,000
H.E. ..	— ..	50,000
4·5 in.—Shrapnel ..	86,400 ..	347,500
H.E. ..	43,200 ..	476,500
60-pdr.—Shrapnel..	16,800 ..	123,100
H.E. ..	7,200 ..	137,450

As already indicated, Sir George Gibb was appointed an additional member of the Army Council early in the month of December, with a view to strengthening the internal administration of the War Office in respect of munitions contracts.

On 12 December the Master-General of the Ordnance sent him a list of outstanding requirements for munitions, inviting his help in securing contractors from whom deliveries could be obtained by the summer of 1915. It was understood that these additional orders were not in any way to interfere with existing contracts, either as regards manufacture, raw materials, or labour. The list included the following items :—

No. 80 T. & P. fuses	100,000 a week.
No. 82 ,, ,, ,, ...	10,000 ,,
No. 83 ,, ,, ,, ...	5,000 ,,
No. 65A ,, ,, ...	7,500 ,,
D.A. Fuse No. 44	35,000 ,,
Complete rounds of 18-pdr. ammunition without fuses	85,000 ,,
Complete rounds of 13-pdr. ammunition without fuses	15,000 ,,
4·5 in. lyddite shell cases* and primers	10,000 ,,
4·5 in. shrapnel shell cases and primers	10,000 ,,
60-pdr. lyddite shell*	3,000 ,,
60-pdr. shrapnel shell	3,600 ,,
6 in. gun lyddite shell	(No quantity stated)
8 in. lyddite shell	1,000 a week
·303 in. rifles, short, Lee-Enfield III...	10,000 or 20,000 ,,
Small arms ammunition	10,000,000 ,,

* Including filling.

By this time all the principal manufacturers were congested with work, and it was highly desirable to open out new sources of supply rather than to overload any further the capacity of the armament firms. In these circumstances it was thought advisable to take counsel with representatives of the manufacturers "in order to ascertain how the industrial resources of the country could best be organised to meet still further demands for artillery ammunition." This conference was

held on 21 December, 1914, at the War Office.[1] The Master-General of the Ordnance and Sir George Gibb, accompanied by Mr. Wintour Mr. Hanson and Mr. Dannreuther, met representatives of :—[1] Messrs. Sir W. G. Armstrong, Whitworth & Company (A.B.D.), Messrs. W. Beardmore and Company (A), Messrs. Coventry Ordnance Works (B.D.), Messrs. Cammell, Laird & Company (A), Messrs. Dick Kerr & Company (A), Messrs. The Electric & Ordnance Accessories Company (B.C.), Messrs. T. Firth & Sons (A), Messrs. Harper, Sons & Bean (A), Messrs. Hadfields, Ltd. (A), Messrs. Head, Wrightson & Company (A), Messrs. The King's Norton Metal Company (B.C.D.), Messrs. The Projectile Company (1902) Ltd. (A), Messrs. Rees Roturbo Manufacturing Company (A), Messrs. Vickers, Ltd. (A.B.C.D.). Messrs. J. & P. Hill (A) and Messrs. Watson Laidlaw & Company (A) were invited, but were unable to send representatives.

It will be interesting to notice that the above list includes two firms—Messrs. Rees Roturbo Manufacturing Company and Messrs. Head, Wrightson & Company—which were the first firms outside the circle of the armament firms proper to undertake shell production on a comprehensive scale.

Sir George Gibb said that it was essential to ascertain what the present contractors could do to increase their output ; when the increase would commence ; what additional labour they would require ; and what prospects there were of obtaining it. He assumed that manufacturers could not make more fuses without extending their works, and said that he was prepared to discuss some fair financial arrangement in connection with such extensions, his idea being to assure them a fair profit. He presumed also that it would be necessary to go to America to obtain the extra machinery and plant, or at least some of part it. He urged that the contractors should pool their requirements in order to avoid unnecessary competition and to make it easier to get the machinery. Each firm would send out experts to select the machines and to be responsible for their suitability, while the War Office would, so far as possible, arrange for the purchase.

The manufacturers, with practical unanimity, drew attention to the increasing scarcity of labour. This meeting, in fact, marks a turning point, for from this moment labour questions predominated over all other issues. The firms' representatives made it clear that, in almost every case, they could not promise an increase of output

---

[1] The letters A. B. C. D. indicate the type of contracts held by the firm at the date :—

A. Contractors for *Shell*.—Messrs. Douglas Grant, Ltd. (Kirkcaldy) and the James Cycle Co. also had contracts for iron shell.

B. Contractors for *Fuses*.—Contracts for fuses were also held by Messrs. G. Kent, Ltd. (London), Raleigh Cycle Co. (London and Nottingham), Sterling Telephone Electric Co. (London), and Vauxhall Motors (1914), Ltd., (Bedford).

C. Contractors for *Primers*.—Contracts also held by the Birmingham Metal and Munitions Co., Messrs. Kynoch, Ltd., and Messrs. Eley Bros.

D. Contracts for *Cartridge Cases*.—Contracts also held by the Birmingham Metal and Munitions Co., Kynoch, Ltd., and Messrs. Allen Everitt and Sons.

unless they were furnished with additional labour, which they could not find themselves. This question will be referred to below.[1]

Apart from general considerations, the conference gave particular attention to requirements for fuses and shell. With regard to fuses, increased output was offered by Messrs. Armstrong, the Coventry Ordnance Works, and the King's Norton Metal Company, while Messrs. Beardmore were prepared to put down new shops for the purpose. All the offers, however, were contingent on the necessary labour being found, and in any case no increase in output was to be expected for some five or six months.

The additional orders for shell provisionally accepted amounted to a total of 60,500 lyddite shell and 8,000 shrapnel, made up as follows :—

13-pdr :—
Lyddite, 5,500 (2,500 possibly 15-pdr. or 18-pdr.).
18-pdr. :—
Lyddite, 37,000.
4·5-in. or 5-in. :—
Lyddite, 11,500 (3,000 possibly 6-in.).
Shrapnel, 7,000.
60-pdr. :—
Lyddite, 2,000.
Shrapnel, 1,000.
6-in. :—
Lyddite, 3,500.
8-in. :—
Lyddite, 1,000.

Most of the firms made their offer conditional on the supply of labour, while new buildings or plant were stated to be necessary by Messrs. Hadfield, Armstrong, Firth, Harper Sons & Bean, and the King's Norton Metal Company. In spite of the failures that the firms were experiencing among their sub-contractors,[2] nothing said at this conference revealed any apprehensions about the soundness of the general policy that had been adopted. Though offers made by the firms (notably those for the smaller natures of shell) did not cover the requirements stated on the Master-General of the Ordnance's list, it was still hoped that, by means of further sub-contracting and subsidised extensions, the growing needs of the Army could be met. The crucial difficulty put forward was the shortage of labour ; and the general impression left was that, if this could be overcome, all would be well.

II. Placing of Long-dated and Continuation Orders for Shell in the first Months of 1915.

Thus the shell conference, while it gave rise to important developments in connection with the supply of labour, led to no immediate modification of the existing arrangements for obtaining supplies.

---

[1] See below p. 124. [2] See below p. 126.

During the first weeks of 1915, renewed attempts were made to secure increased output from the armament firms and their sub-contractors, and when these sources of supply proved obviously inadequate the capacity of overseas contractors was drawn on to an ever-increasing extent.

In the middle of January a circular was sent to all firms holding contracts for warlike stores urging them to make still further efforts. The letter issued ran as follows :—[1]

> "I am directed to inform you that, in spite of the great efforts which have been made by the manufacturing firms of this country to meet the requirements of the Naval and Military services, the supplies of ammunition and other warlike stores promised for delivery, are not so great as the Secretary of State would wish to see provided for the troops, which it is contemplated to place in the field. I am, accordingly, to enquire whether it is within your power still further to increase the output of the various munitions of war which you are producing under War Office contracts. If so, I shall be glad if you will let me have, at the earliest possible date, particulars of the further supply which you think you could produce, stating at what time you could begin to deliver the increased output. It should be very clearly understood in this connection that the Secretary of State does not desire that any contractor should promise more than he can perform, or enter upon fresh engagements, which would imperil the due performance of those already made.
>
> If the provision of an increased supply of any article would necessitate the construction of new plant, the fact should be mentioned, but it is not necessary in your immediate reply to go into details of the scheme, or to give an estimate of cost, which must, of course, depend upon the amount to be produced.
>
> The Secretary of State understands that it is rather the shortage of skilled labour and of men qualified to undertake duties of superintendence and management than any lack of material, which is likely to limit the ability of contractors to undertake further extensions. He would be glad to have this view confirmed or corrected in your case."

The replies received to this letter were disappointing. To take a single example, Messrs. Dick Kerr, who had recently accepted orders for 6-in., 4·7-in., and 13-pdr. H.E., could not promise any increase in delivery until August. They could then deliver an additional 1,000 a week of 13 or 18-pdr. H.E., while from September they could make additional deliveries of either 1,000 4·5-in. or 4·7-in. per week, or 500 6-in. They could not undertake further extensions, because the space at their works was limited, and they anticipated difficulties in obtaining enough labour.[2]

As a further encouragement to increased shell production, the practice was adopted of giving running contracts, *i.e.*, a contractor

---

[1] Contracts/1281/1A. [2] *Ibid.*

was instructed to continue delivery at his maximum rate on the completion of his existing contracts, until three months' notice should be given him to discontinue. A number of contracts of this type had been placed with armament firms in the last two months of 1914, and by January, 1915, the placing of these continuation orders had been adopted as the general policy in regard to all contractors whose orders terminated at an early date.[1]

The shell contracts placed up to the end of 1914 had, for the most part, provided for increasing deliveries during the summer and autumn of 1915; the new type of running contract formed a means of making provision further ahead. Similar considerations were taken into account in arranging the enormous overseas orders placed during the first half of 1915, which provided in the main for 1916 deliveries.[2] Some hesitation was felt at the War Office as to the desirability of some of the later American and Canadian orders, but by the middle of March, Lord Kitchener had decided that an effort must be made to secure a large additional output of field gun ammunition for the British Army during 1916, and as he took the view that it was impossible to have too much, the orders in question were proceeded with.[3] Since the supply of shell was, in fact, the outstanding problem of this period, and since overseas sources of supplies formed the only apparent means of meeting the anticipated demands for 1916, it is worth while to give some indication of the huge dimensions assumed by orders with American firms and the Canadian Shell Committee.

Before the end of 1914, the Bethlehem Steel Company, who, as has been seen, had received their first order in October, had undertaken in addition to deliver 1,000,000 complete rounds of 18-pdr. shrapnel by October, 1915,[4] and contracts had also been placed, through Messrs. Firth and Messrs. Vickers, with the Washington Steel and Ordnance Company and Messrs. E. W. Bliss, the former undertaking 13-pdr. and 18-pdr. H.E. and 6-in. lyddite, and the latter 5-in. howitzer lyddite. In February, 1915, the Bethlehem Company were given another contract[5] for 18-pdr. shrapnel complete rounds, and on 9 March, as the result of enquiries by Messrs. J. P. Morgan, who had recently been appointed Purchasing Agents in the United States, an offer was made for the supply by the Bethlehem Company and its associates of 4,500,000 18-pdr. complete rounds. This output was originally offered to the Russian authorities, but being refused by them it became available for the British War Office. Orders already placed for 18-pdr. ammunition would give an output of more than 1,800,000 a month, but in view of Lord Kitchener's plans for 1916 this additional output was accepted, for delivery at the rate of 250,000 a month from January, 1916.[6]

---

[1] Contracts/S/7275/1A; 7958.

[2] Similar long-dated orders were placed in the United States for rifles during this period. See above p. 98.

[3] 94/S/128.

[4] Contracts/C/9104, 9724.

[5] Contracts/S/8079.

[6] RSC/S/37, 94/S/128.

Other important long-dated orders placed with American firms during the earlier months of 1915 were two in January, one with the Trayler Engineering and Manufacturing Company[1] for 1,000,000 18-pdr. H.E. (delivery April, 1915, to January, 1916), and one with Messrs. Bliss[2] for 2,000,000 18-pdr. shell and components (delivery April, 1915, to April, 1916); and a third in April with the American Locomotive Company[3] for 5,000,000 18-pdr. complete rounds, in equal proportions of shrapnel and H.E. (delivery September, 1915, to August, 1916). Orders were also placed during this period for 4·5-in., 6-in., 9·2-in., and 12-in. shell.

During the first half of 1915 similar large orders were given to Canada. By the end of 1914 the Shell Committee had undertaken to produce 1,600,000 18-pdr. shrapnel shell, of which over 1,000,000 were to be complete rounds.[4] Early in 1915 running contracts were arranged for a monthly output of 200,000 18-pdr. H.E. and 150,000 shrapnel complete rounds,[5] and orders for 4·5-in. H.E. shell, 60-pdr. H.E. shell, and 13-pdr. H.E. complete rounds were also given. In April, an offer of a further 4 or 5 million complete rounds of 18-pdr. was made, and though the Shell Committee's existing orders would, at the end of the year, be giving a weekly output of 100,000 of this nature, the offer was accepted, after the matter had been referred to the Secretary of State. The contract concluded at the end of April was for 5,000,000 rounds, in equal quantities of 18-pdr. shrapnel and H.E. and 4·5-in. H.E., for delivery by March, 1916.[6]

During the early part of 1915, in fact, overseas contractors assumed a place of the utmost importance, since upon them the War Office was forced to depend for the bulk of the shell supplies required for the 1916 campaign. The proportion of overseas to home orders may be illustrated by taking the nature for which there was the greatest demand—the 18-pdr. Of a total of nearly 16,000,000 18-pdr. shrapnel ordered up to the end of May, 1915, nearly 11,000,000 were to come from abroad, while of the H.E. type, 10,000,000 out of a total of 14,000,000 had been ordered from overseas contractors.

These large orders, however, since they were mainly for 1916 delivery, could be of no assistance in meeting the immediate demand from the front, which during the spring of 1915 was growing ever more urgent, while at the same time it became more and more obvious that supplies were not coming forward at the expected rate. In point of fact, the deliveries which should have been coming in during this period from the earlier overseas orders were almost as much in arrears as those from home contractors, thus still further widening the gap between estimated and actual supplies.[7]

---

[1] Contracts/S/8023.

[2] Contracts/S/8057. The Bethlehem Company subsequently undertook to assemble the components.

[3] RSC/S/118.

[4] Without the fuse, which Canada could not supply at this time.

[5] Contracts/S/7970, 8243.

[6] 94/S/182.

[7] See below p. 128.

III. The Breakdown of Supply.

(*a*) Introductory.

The failure of the main shell contractors at home to make good their promised deliveries was already an established fact at the end of 1914. By the time of the Shell Conference it had become clear that the output arranged for under the programme of subsidised extensions and increased sub-contracting was not materialising at the anticipated rate. This can be seen from the table given in Appendix III, which shows the position with regard to deliveries, on 31 December, 1914, and on 29 May, 1915.

Similar examples of delayed deliveries might be quoted in the case of other stores: the machine guns ordered from Messrs. Vickers early in August were considerably in arrears; gun contractors, though the bulk of their deliveries were not yet due, were already finding themselves unable to live up to their promises. It was, however, on the shortage of ammunition that the issue in the spring of 1915 turned, and it is not necessary to seek for further illustrations outside the story of shell supply.

For some weeks past signs had been multiplying that contractors would be unable to keep to their promised rate of delivery. A good illustration is found in a letter written by Messrs. Cammell Laird on 5 October, 1914,[1] which gave reasons for the necessity of revising in a downward sense the estimates of delivery placed before the War Office on 19 August when the first orders for shell were being settled. During the intervening six weeks, as the firm explained, the conditions had materially altered so that the prospects were no longer as favourable as had been hoped for. The three dominant factors were (1) labour supply, (2) machinery, (3) the assistance to be obtained from sub-contractors.

(1) *Labour Shortage.*—This had not been reckoned on in August but already its incidence was serious.

> "From our own Shell Department many of the younger men, thoroughly trained and skilled in shell manufacture, enlisted; and other works being similarly placed efficient substitutes cannot be found within the district. We are in constant communication with the various Labour Bureaux, and have sent our own officials round Manchester, Leeds and Derby, but there seems no doubt that the demand for skilled workmen, such as are required for the manufacture of shell, exceeds the supply. Even when good mechanics are obtained from other trades they require special instruction before they are capable of performing useful work. This shortage has another retarding effect as unfortunately men are disinclined to work during Saturday afternoon and Sunday, and so far as we can judge, any attempt on our part to force them would result in their leaving our employment."

---

[1] Contracts S/6980.

(2) *Supply of new machinery.*—Messrs. Cammell further drew attention to the difficulty experienced in procuring the necessary supplies of additional machinery :—

> "At the time our letter was written it was thought that no special difficulty would be experienced in obtaining machines. We may regard ourselves as fortunate in having procured 26 high-class machines during the past two months ; but the manufacturers' stocks of suitable machines appear to be nearly exhausted, and some time must elapse before we can make extensive additions to our plant."

(3) *Failure of Sub-contractors.*—Finally the hopes and expectations of assistance from the sub-letting of work had to be revised. With regard to those assisting with special machine work, Messrs. Cammell had now realised that

> "in spite of precautionary advice on our part they were too optimistic of their powers of production with regard to initial as well as continuous delivery. The conversion of machines, designing and making special tools and instructing men has taken longer than they anticipated : and furthermore they would not be convinced that the manufacture of shell had difficulties different from those they had been accustomed to meet. We believe that with many firms their powers of production will continuously improve, but in estimating their first deliveries we regret that sufficient allowance was not made for their want of experience."

With regard to contractors supplying fittings and component parts required to complete various types of shell it was realised that the demand on their resources had increased so suddenly that they too were failing to fulfil delivery promises ; but it was hoped that there would be an improvement as soon as supply became better regulated to meet the demand—a wish whose fulfilment was unfortunately still a very long way away.

Shortage of labour and machinery and the failure of sub-contractors were in fact the principal causes of the breakdown of supply in the spring of 1915, and it is therefore worth while to consider each of these points in some detail.

(*b*) Labour for Armament Work.

The outbreak of war brought in its train the menace of serious unemployment, in consequence of the dislocation of continental trade and the breakdown of international credit. Emergency steps for the provision of employment were, therefore, necessary at the very time when the first recruiting campaign was opened, and the manufacture of armaments was calling for additional labour.

Time was required for the absorption of even skilled men into munitions work. The extension of the scale of operations was necessarily gradual, and involved local concentration and transfer of labour before it could be effective. It was inevitable in these circumstances that an apparent surplus of unemployed skilled men should be found in many engineering centres, even while the private and public arsenals of the country were preparing to absorb additional labour of this

essential type. Meanwhile, many of these men were being enrolled for military service. By October, 1914, the engineering trade group lost by enlistment 12·2 per cent. of its male workers as compared with the period three months earlier. By February, 1915, this proportion had increased to 16.4 per cent. and by July, 1915, to 19·5 per cent., though this exodus was partially counteracted by the immigration of workers from other trade groups.

Already in September, 1914, many of the principal armament works were experiencing difficulties due to the recruitment of their skilled employees, and there arose a general demand for some form of protection or special inducement. In response to a request by an important firm for permission to issue a recognised badge to their men, replies were sent on 8 September, 1914, both by Lord Kitchener and by the Master-General of the Ordnance, the latter of whom suggested that a ticket should be issued to each employee "indicating that he is engaged in the manufacture of munitions of war and that therefore he is unable to serve his country in any other manner." Six weeks later action was initiated at the Admiralty by the First Lord, who, on 27 October, caused inquiries to be made of important Admiralty contractors "as to how far their operations have been hampered by the withdrawal of workmen to fight." At the same time he ordered a badge to be designed, bearing the words "Admiralty service," for issue to all men employed on Admiralty work of a necessary character. This proposal was referred to the War Office, who, however, adhered to their preference for a ticket as making personal identification easier and thus diminishing the liability to misuse.

In November, 1914, a memorandum couched in similar terms, being in substance a reproduction of Lord Kitchener's letter of 8 September, was circulated by the War Department[1] and the Admiralty[2] to the armament firms respectively employed by them. The purport of these documents, which bore the signatures of the First Lord and the Secretary of State respectively, was to impress upon the employees of such establishments "the importance of the Government work upon which they are engaged," and to assure them that "in carrying on the great work of providing for the requirements of the Royal Navy (providing the Army with supplies and equipment) they are doing their duty for their King and country equally with those who have joined H.M. Forces for active service afloat or ashore (joined the Army for service in the field)."

The proposed issue of badges by the Admiralty was temporarily suspended owing to Treasury objections to the expenditure, but the question was again raised and referred to the Cabinet, who decided in favour of the scheme. The issue of badges by the Admiralty was sanctioned on 26 December. The policy of the War Office in the matter was also revised, and in March, 1915, a new branch in the Department of the Master-General of the Ordnance was set up to deal with the issue of badges, contracting firms being classified for this

[1] 27/Gen. No./2750. [2] P. 2511.

purpose according to the importance and urgency of the work undertaken.[1]

In the meantime, however, the shortage of skilled men was having serious results. The importance which the labour question had assumed by the autumn of 1914 can be clearly seen from the position at Woolwich Arsenal in October, when the Chief Superintendent of Ordnance Factories was asked to make arrangements for an increased output of field guns and ammunition. On 12 October, in reporting the results of his preliminary enquiries, Sir F. Donaldson wrote :—

"I think it is necessary to refer to a difficulty which we may anticipate, and this is the requisite labour of a skilled nature to man these machines when we get them. Such men are coming forward very slowly, much more slowly than we had hoped for, and we already suffer from this dearth."

On the day following the conference between the Cabinet Committee and gun makers (13 October) the Chief Superintendent, as already mentioned, sent a memorandum[2] to the Master-General of the Ordnance in which he dealt, among other matters, with his labour requirements.

> "I should like it to be very clearly understood that any success to be attained in making this exceptionally large output will depend almost entirely upon our being able to secure the requisite labour of suitable type. This, as I pointed out, is a present very great difficulty, and how it is to be overcome is not readily seen, otherwise it would have been overcome already. The only way in which improvement may be possible would be that we should give a guarantee to suitable men of employment, or its equivalent, for two years, or, if necessary, three years ; the effect of this would be that men engaged on these terms would, on the completion of the war, previous to the expiration of the guaranteed period and the cessation of excessive urgency, have to be dispensed with, with a bonus for the unexpired period of the guarantee. It is suggested that this might be half day-rates in a lump sum for the unexpired period. This, I am aware, can hardly be regarded as a very sound business proposition, but none the less under present special circumstances we shall have to do something of the sort if we are to ensure getting the men we want. Even so, it is not certain that success will be attained by this means. One of the great difficulties to it undoubtedly will be that it will be hard to resist giving similar guarantees to other men engaged, though it may be possible to restrict the concession to men of a particular class.
>
> "I must again emphasise the statement already made that unless men can be got, and got readily, it will be impossible to carry out the programme."

It was not enough to secure the provision of additional labour for the Arsenal, since a certain amount of the work had already been placed

---

[1] An account of the steps taken with regard to protection and limitation of recruiting will be found in Vol. I, Part II, Chap. I.

[2] 75/Gen. No./1561.

with private firms, to the number of 25, on gun carriages alone. The Chief Superintendent wished to have powers to compel firms to give preference to War Department orders over those of private clients.[1]

The labour problem was thus raised for the first time in acute form, and the radical proposals put forward by the Chief Superintendent of Ordnance Factories raised important questions of policy, which were discussed at a conference between War Office and Board of Trade representatives on 5 November, 1914.

It was then agreed that in order to secure the transference of the necessary men it would be enough to guarantee one year's employment without special rates of pay. The power to give this guarantee was approved by the Master-General of the Ordnance on 7 November, 1914, but was not put into operation, since the Chief Superintendent reported on 10 November that the action taken was bearing good fruit, and that it might not be necessary to make use of the guarantee.

As has already been mentioned, the increasing shortage of labour was the most important point revealed by the Shell Conference of 21 December, 1914, and the promises of increased output made at that conference were conditional on the necessary labour being forthcoming. In the discussion which took place on the labour question, various suggestions were made. Sir Trevor Dawson, representing Messrs. Vickers, thought that the labour deficiency might be largely mitigated by using Belgians, but he recounted various difficulties, official and otherwise, which he had met in his efforts to obtain skilled Belgian labour through Holland. He also suggested that women might be trained, and that the Government should authorise all workmen to remain in their present employment, and commandeer men, to be sent from factories engaged on private work, to the large armament firms.

This last proposal, it was pointed out, had been considered some time before and dismissed, but a memorandum had been issued to contractors by Lord Kitchener, and recruiting officers had been instructed not to enlist workmen from specified firms without the employers' permission.

In reply to a statement that Messrs. Armstrong could put their hand on 500 skilled workmen serving with the colours, who would not return unless they were ordered to do so, the Master-General of the Ordnance promised to take the matter up with the Adjutant-General.

With regard to labour stealing, Sir George Gibb said that he would arrange for a new clause to be inserted in contracts, to the effect that the contractor would not employ men who came from other contractors holding simultaneous contracts for the War Office.[2] He thought that the only means of increasing labour supply at the present time was to arrange for the transfer of men from less important trades.

The results of the Shell Conference were reported to the Cabinet Committee, which assembled on 23 December, 1914.

---

[1] See above p. 110.

[2] It did not prove possible to take this action.

In view of the serious aspects of the labour situation thus revealed, the Board of Trade was instructed through Mr. Runciman to take energetic action for the purpose of securing an adequate supply of labour for armament contractors.

The Cabinet Committee suggested the following measures: (1) to co-ordinate the supply of labour; (2) to substitute Belgians for British workmen; (3) to divert labour from less urgent or unnecessary industries (*e.g.*, railway construction works, etc.); (4) where employers in the less necessary trades were reluctant to part with their men, to put pressure upon them, first by persuasion, and then, if that failed, by refusal of railway facilities, etc., and by publicity for unpatriotic action; (5) any other means for obtaining enough men for all the armament companies.

This new departure marks a turning point in the story of industrial mobilisation. It leads at first away from the War Office to the Board of Trade campaign for the transfer of labour, to the steps taken to deal with the correlative problem of securing relaxation of restrictive practices by trade unions, and so to the work of the Committee on Production, appointed early in February, 1915, and subsequent events, which finally resulted in the Treasury Conferences of March 18 and 25, 1915. The full narrative of these events will be found elsewhere.[1]

(*c*) Shortage of Machinery.

The provision of the machine tools required for the equipment of extensions to factories became a matter of concern early in the war. It was, for instance, one of the points raised by Sir Frederick Donaldson in October, in his memorandum summarising the steps necessary to secure an increased output of field guns.

In consequence of the limited capacity of the home industry and the scale of requirements, it was necessary to have recourse to the United States of America, and the failure of American deliveries of machine tools to come to hand at the anticipated dates, proved a prime cause for the breakdown of the programme of ammunition output arranged by the War Office, the shortage of machinery being one of the excuses most frequently urged by contractors for their delayed deliveries. The following are typical statements made by firms in reply to "hasteners" from the War Office.

Messrs. Armstrong.—

15-pdr. shrapnel (Contract/S/6676). Deliveries not begun owing to non-receipt of machinery. (Letter, 17 February, 1915).

9·2-in. lyddite (Contract/S/6386). Machinery for 9·2-in. and 12-in. howitzer much overdue. (Interview, 1 February, 1915).

4·7-in. lyddite (Contract/S/6834). Delay due to non-receipt of machinery. (Letter, 28 April, 1915).

---

[1] Vol. I, Part II.

Messrs. Vickers.—

4·5-in. lyddite (Contract/S/6993). Work prevented by delay in delivery of machinery from United Kingdom and United States of America. (General Mahon's Report, 22 May, 1915).

18-pdr. shrapnel (Contract/S/6507). Output held up for want of 38 screw milling machines. (General Mahon's Report, 12 March, 1915).

(*d*) The Failure of Sub-Contractors.

From the correspondence between the War Office and the main contracting firms it does not appear that the latter were, in the early months of the war, feeling the effects of labour shortage so acutely as was the case with the subsidiary contractors. The tide of surplus labour was, in fact, setting strongly towards the principal armament contractors in response to the general publicity given to their requirements, stimulated as this was by individual appeals and by the currency of reports as to the high earnings obtainable, and possibly, in some measure also, by the belief that such work would afford protection from the importunity of the recruiting sergeant. The subsidiary contractors had not the same advantages, either in the general recognition of the national character of the work they undertook or in the terms they were able to offer. It was, at least, a common complaint, that while the armament firms, as direct contractors, had *carte blanche* in the matter of expenditure and were able to name their own price, the contracts that were sublet—doubtless, for the most part, confined to the easier and, therefore, cheaper processes—were given on terms which left a very moderate margin of profit. The sub-contractors were further hampered by the difficulty in securing deliveries of machine tools. Many of them, moreover, were new to their work and did not appreciate the high degree of accuracy required in shell manufacture, or the strictness of inspection, with the result that their products failed to pass the tests. They also suffered from the delays already mentioned in obtaining samples, drawings, and specifications ; and it is probable that the difficulty of obtaining immediate supplies of machinery and raw material bore more hardly upon them than upon the large firms.

For these various reasons the sub-contractors did not find their position wholly satisfactory, for the cumulative weight of the economic and technical difficulties of their undertaking seemed to concentrate upon them without any countervailing compensation, and this discontent, doubtless, encouraged them to give the first place wherever possible to direct orders, and to complaints that undue preference was given by the War Office to the armament firms.

The cumulative result of the above-mentioned difficulties was, that the sub-contractors commonly disappointed the expectations of the principal contracting firm, and this was, perhaps, the most general form of excuse given by the latter to the War Office in response to complaint as to overdue deliveries.

The difficulties experienced with sub-contractors may be illustrated by following in some detail the fortunes of a particular contract for

4·5-in. H.E. shell, placed with Messrs. Cammell Laird on 2 September, 1914.

Tenders for 14,600 4·5-in. howitzer common lyddite shell were issued on 17 August. Messrs. Cammell explained on the following day that they were making special provision for the manufacture of shell of 6-in. calibre and over by increasing the equipment of their own shops, but that they had come to an arrangement with the Sheffield Simplex Motor Car Company whereby their works, which were thoroughly equipped with tools suitable for machining shell below 6-in. had been placed at their disposal.[1] A few days later Messrs. Cammell stated that they had accepted Admiralty orders for approximately 65,000 shell below 6-in., and that it would be difficult to estimate deliveries of 4·5-in. or other land service shells without knowing the sequence of requirements. If they were permitted to allocate their machinery in the proportion required between the Departments, they could promise prompt delivery.[2]

On 26 August this suggestion was referred to the Admiralty, asking that the output of the firm should be shared as proposed. The Admiralty accordingly undertook to diminish their orders with the firm to the extent of 30,000 12- and 14-pdr. common shell in order that Messrs. Cammell might be in a position to give half their capacity for shell below 6-in. to land service and still complete their essential naval orders within the necessary time. An order was therefore placed on 2 September for 14,600 4·5-in. lyddite shells. On 4 September the firm were asked to quote for a further 5,400 as a contribution towards a further requirement of 12,000, and this amount was added to the original order,[3] the deliveries to follow its completion, which was due at the end of 1914.

First deliveries on the original order were expected on 23 September, but on 30 September Messrs. Cammell were unable to promise deliveries before November.[4] They had trusted entirely to sub-contracts with the Hardy Patent Pick Company and the Sheffield Simplex Company and the former had altogether failed. They were considering the possibility of making these shells in their own shops, but this would entail some further relaxation of Admiralty work. The question was referred to the Admiralty on 4 October, the War Office pointing out that "the expenditure of 4·5-in. ammunition has been considerably more than was expected and we are in difficulties." The Admiralty replied on 20 October[5] expressing their inability to assist in a way which would entail delay in the supply of naval 6-in. shell. Messrs. Cammell's contracts were admitted to be in a very unsatisfactory condition and it was clear that the firm were not in a position to satisfy the requirements of both Departments for lyddite shell concurrently.

---

[1] Contracts/FirmsC/2367.

[2] Messrs. Hadfield who had also been invited to tender, had declined on the ground of "extreme pressure of Admiralty work" (Contracts/S/6573).

[3] The contract (Contracts/S/6573) was dated 9 September. The balance of the 12,000 was ordered from Messrs. Armstrong and the Projectile Company.

[4] Contracts/S/6924.

[5] G./19866/14 in Contracts/S/7113.

On 11 November the War Office enquired of Messrs. Cammell whether their revised promise of delivery in November would be made good, but the firm could only hold out the hope that the shell would be forthcoming "unless sub-contractors fail"; and on 12 December the War Office was informed that "we are finishing these shell ourselves as our sub-contractor (the Sheffield Simplex Motor Works) have failed to do so." On 10 December a telegraphic inquiry as to why the shell had not been delivered as promised elicited the fact that deliveries were beginning. A week later the firm stated that they proposed, in order to place the work on a better footing, to extend their own shops, and on 5 January, they were instructed to proceed with their output of 4·5-in. shell at the rate of 600 a week, and to put down plant for an additional 1,000 a week, the maximum of 1,600 a week to be reached by 1 July, 1915.

(*a*) The Failure of Overseas Supplies.

The result of the shortage of labour and machinery and the failure of sub-contractors was, as has been indicated, to falsify the estimates on which the War Office had relied and to bring about a serious actual and prospective shortage of shell. It must not be forgotten, moreover, that by the spring of 1915, deliveries should have been coming in from overseas on a considerable scale, but here again expectations were not fulfilled. The orders which had been placed during the autumn of 1914 in both Canada and the United States had by May, 1915, produced a comparatively small output.

Canadian deliveries of shell were particularly disappointing. The Shell Committee had to contend with all the difficulties of organising manufacture among a large number of inexperienced firms, and as a large proportion of their promised output was to be in the form of complete rounds, they had also to arrange for the various components to come forward at corresponding rates. It is not surprising that they failed to secure co-ordination in this respect, with unfortunate results. The manufacture of shell bodies outran that of other components and by the end of May the arrears of 18- and 15-pdr. shrapnel shell were comparatively small, but though 800,000 complete rounds of 18-pdr. shrapnel were due only 21,000 had been delivered, and these were without primers, the manufacture of which had presented particular difficulties, as well as fuses. They had not at that date succeeded in producing any complete rounds of 18-pdr. H.E. or any 4·5-in. shell.

The greater part of the American shell orders, as has been seen, were placed in 1915, and were not due for delivery till the second half of the year. A considerable output, however, was due by the middle of the year from the Bethlehem Steel Company, who were then in arrears on their 4·7-in. contract, but practically up to date with 18-pdr. shrapnel shell. Their large contract for complete rounds of 18-pdr. was an outstanding contribution; owing to a strike at the works, although the contract rate was not passed till September, the whole quantity was delivered within contract time.

Deliveries of shell from other American firms were considerably behind the contract rate. At the end of May, 1915, for instance, 245,000 18-pdr. H.E. shell were due from three firms, but only 27,500 had been delivered, the bulk of these coming from one firm, the Washington Steel and Ordnance Company. The delay was in part due to the unexpected difficulties sometimes encountered owing to lack of familiarity with British specifications and methods of manufacture. For example, in the case of the Bethlehem Company's first contract for 4·7-in. H.E. shell, arranged in October, 1914, a month elapsed between the signing of the contract and the decision as to the Mark of shell to be made, and when the firm finally received the specification they found that the method of manufacture required involved processes, such as boring the shell internally, which they had never contemplated when fixing the price, the misunderstanding being due to the difference between American and English technical expressions. In effect the firm had "quoted for an entirely different article to that which they are expected to supply. The English were ignorant of the American methods and the Americans were ignorant of English methods." In view of the interruptions and difficulties experienced, the firm had by the end of 1915 found this contract unremunerative.[1]

IV. The Need for Complete Industrial Mobilisation.

It has been seen that by the end of 1914 delays in shell deliveries had assumed a sufficiently serious aspect, and the prospects for the future were such as to cause serious concern to the authorities concerned with munitions supply. Even so, no drastic revision of the policy hitherto followed was as yet considered necessary. The appointment of Sir George Gibb in December as an additional member of the Army Council marked an important departure in supply administration, but the first steps which he took towards improving the supply position followed the familiar line of consultation with the established contractors; and the conference to which those contractors were summoned, by pointing to the labour shortage as the crucial problem, did little to shake the faith of the War Office in the policy of organising industrial resources through the armament firms.

On the last day of 1914 the Board of Trade was called in to assist the War Office to find the labour required for munitions work. The most hopeful course was considered to be the diversion of labour from firms engaged on private work to the armament firms. Owing to the wide extent of the sub-contracting system a campaign on these lines was beset with many difficulties, and, in addition, firms outside the armament group were more disposed to ask for contracts for themselves than to part with their men. As has been seen,[2] it was not easy for untried firms to obtain direct War Office contracts,

[1] 94/S/176. The price originally quoted by Bethlehem (£3 per shell) was as low as the lowest British price at that time.

[2] See above p. 107.

and the process by which direct contractors evolved from sub-contractors was bound to be a gradual one. Nevertheless, a few of the larger engineering firms had obtained shell contracts before the end of 1914, and it is significant that their representatives were included among the delegates to the Shell Conference.

In the first months of 1915 the demand from engineering firms for direct contracts, stimulated by the danger of losing workmen, grew steadily. The possibilities thus opened up were recognised by the Board of Trade as soon as they began their preparations for the campaign for diverting labour and under the auspices of the Board there sprang up a powerful movement for the local organisation of munitions production, independent of the armament firms. The steps taken to provide labour for munitions work and the development of the movement for industrial mobilisation are described in the succeeding parts of this volume. It is only necessary to point out here that demands for a revision of the War Office supply policy in the direction of a further spreading of contracts were being made by the engineering industry some weeks before public attention was attracted to the shortage of munitions and before the beginning of the accusations launched against the War Office in the House of Commons and in the Press in the spring of 1915.

As has been shown in an earlier chapter, repeated demands were received from the front from the end of 1914 onwards for a more liberal supply of ammunition. To these appeals, the War Office could only reply that they were fully aware of the importance of increasing supplies and were sparing no efforts to secure the highest possible output from every available source.[1] By March, 1915, however, it was no longer possible to conceal the fact that so far as the immediate future was concerned, an adequate supply of ammunition could not be assured.

In the middle of March the seriousness of the position was revealed by Lord Kitchener, when, in speaking in the House of Lords on the 15th he admitted that supplies were not coming up to expectations and that there was great cause for anxiety. The main theme of his speech was the improvement which the Government hoped to effect by means of the Defence of the Realm Amendment No. 2 Act, the second reading of which was later moved by Lord Crewe. The provisions of this Act and the terms come to with Labour at the end of March are discussed elsewhere, but a portion of the speech may be quoted here, because of its importance as an official pronouncement on the shortage of munitions.

> "The work of supplying and equipping new Armies depends largely on our ability to obtain the war material required. Our demands on the industries concerned with the manufacture of munitions of war in this country have naturally been very great, and have necessitated that they and other ancillary trades should work at the highest possible pressure. The armament firms have promptly responded to our appeal, and have undertaken orders

[1] See above p. 23.

of vast magnitude. The great majority also of the employees have loyally risen to the occasion and have worked, and are working overtime and on night shifts in all the various workshops and factories in the country.

"Notwithstanding these efforts to meet our requirements, we have unfortunately found that the output is not only not equal to our necessities but does not fulfil our expectations, for a very large number of our orders have not been completed by the dates on which they were promised.

"The progress in equipping our new Armies and also in supplying the necessary war material for our forces in the field has been seriously hampered by the failure to obtain sufficient labour and by delays in the production of the necessary plant, largely due to the enormous demands, not only of ourselves but of our Allies. While the workmen generally, as I have said, have worked loyally and well, there have, I regret to say, been instances where absence, irregular timekeeping, and slack work have led to a marked diminution in the output of our factories. In some cases the temptations of drink account for this failure to work up to the high standard expected. It has been brought to my notice on more than one occasion that the restrictions of trade unions have undoubtedly added to our difficulties, not so much in obtaining sufficient labour as in making the best use of that labour. I am confident, however, that the seriousness of the position as regards our supplies has only to be mentioned and all concerned will agree to waive for the period of the war any of those restrictions which prevent in the very slightest degree our utilising all the labour available to the fullest extent that is possible.

"I cannot too earnestly point out that unless the whole nation works with us and for us, not only in supplying the manhood of the country to serve in our ranks but also in supplying the necessary arms, ammunition, and equipment, successful operations in the various parts of the world in which we are engaged will be very seriously hampered and delayed. I have heard rumours that the workmen in some factories have an idea that the war is going so well that there is no necessity for them to work their hardest. I can only say that the supply of war material at the present moment and for the next two or three months is causing me very serious anxiety, and I wish all those engaged in the manufacture and supply of these stores to realise that it is absolutely essential, not only that the arrears in the deliveries of our munitions of war should be wiped off, but that the output of every round of ammunition is of the utmost importance and has a large influence on our operations in the field."

* * * * * * * *

"Labour may very rightly ask that their patriotic work should not be used to inflate the profits of the directors and shareholders of the various great industrial and armament firms, and we are therefore arranging a system under which the important armament firms come under Government control, and we hope that

workmen who work regularly by keeping good time shall reap some of the benefits which the war automatically confers on these great companies. I feel strongly, my Lords, that the men working long hours in the shops by day and by night, week in and week out, are doing their duty for their King and country in a like manner with those who have joined the Army for active service in the field. They are thus taking their part in the war and displaying the patriotism that has been so manifestly shown by the nation in all ranks."[1]

Before this speech was made, the first criticisms of the War Office supply policy had been heard in the House of Commons. On 1 March Mr. Asquith made a speech on the Supplementary Vote of Credit for 1914–15 and the Estimates for 1915–16, in which he compared the rate of expenditure on army services with the cost of great wars in the past. In the debate which followed Mr. Bonar Law urged that further utilisation of the industrial resources of the country was both possible and necessary.

"I do ask, not by way of criticism, but by way of suggestion, Are we doing everything that we can to end this war? I think, as regards the Army and the Navy, we are doing everything we can, but what about utilising the industrial resources of this country. One of the lessons which our enemy ought to have taught us is that their preparation for war meant just as much the organisation of the civilian population as the organisation of those who are actually bearing arms. That is comparatively easy in a State of governed like Germany, for in war, as each form of government has its advantages and disadvantages, a despotic Government has the advantage that it can more easily control these things; but we have seen from what happened in France that it is possible for a democratic country too. When the war broke out France mobilised the whole of her industry in precisely the same way in which she mobilised her troops. Have we done, and are we doing, the same? The Government know that both this House and the country will give them all the power they ask. We are the greatest manufacturing country in the world. This war has been going on for seven months, and if—I do not say that it is so, for I do not know—after seven months there is a shortage of ammunition, or of the necessary munitions of war, then, in my belief, we have not utilised to the utmost the industrial resources of this country, and I say to the Government now that to bring this war to a close nothing that they can do would be more effective than to look at the industrial position of the country and to consider, though business as usual is wise from the point of view of stopping panic, though business is necessary, that the first necessity is to provide what we need for this war, and it should be done, and other business must wait until the needs of the State have first been met. I hope that is being done, and I am sure that it ought to be done."[2]

---

[1] *Parliamentary Debates* (1915) *H. of L.*, XVIII, 721–724 (15/3/15).
[2] *Parliamentary Debates* (1915) *H. of C.*, LXX, 606-7.

Mr Bonar Law reiterated this view a week later: "I do think that we have not mobilised the industries of the country in the way in which it was possible to mobilise them for the purposes of the war."[1]

On 1 March, Mr. Bonar Law could say that he did not know whether there was in fact a shortage of ammunition. A fortnight later the position was made clearer by Lord Kitchener's speech in the House of Lords, and this was followed by a Press campaign for better organisation.

Towards the end of March, *The Times* published two or three articles on the subject of the shortage of ammunition.

> "Evidence has recently been accumulating from the seat of war to prove that the only thing which is now delaying the active progress of operations. . . is the inadequate supply of ammunition. The publicly expressed opinion of the highest authority on the spot coincides with much other information to establish the fact beyond the possibility of doubt. . . the problem of the moment is to increase the supplies and it is an industrial, not a military problem."[2]

During the next fortnight the criticisms of the Government's arrangements for supplying munitions grew more and more pointed. The campaign against drink was at this time at its height, and on 6 April, *The Times* pointed out that public attention was being diverted from the business of producing war material to the drink question :—

> "The thing wants handling in a large way. The national resources in men, premises and plant capable of turning out the material required should be pooled, and the items redistributed to the best advantage. The need has not been realised before, and no doubt the authorities have been overwhelmed with work: but it is certain that the national resources have not been utilised to the full. Indeed, no attempt has been made to do so."

At the end of March, Lord Kitchener had appointed an Armaments Output Committee, to assist in the provision of labour for munitions work. Its formation was announced in the Press on 7 April, and commenting on it on the following day, *The Times* wrote :—

> "A great deal has been said of late about the shortcomings of certain sections of workmen. We believe far stronger things might be said, with far more justice, about the extraordinary failure of the Government to take in hand in business-like fashion during the early stages of the war the matter of providing a full and adequate supply of munitions. They talked as though they were organising miracles of output, but in point of fact there was no proper organisation at all. The War Office has sought to do too much. It has been jealous of civilian aid. . . the War Office should chiefly devote itself to the task of organising its armies. It should state its requirements as to supplies and leave to others the far more complex task of organising industry."

Two days later (10 April) the charge was reiterated : —

> "The primary reason why Sir J. French is unduly short of munitions is not drink at all. It is that in our previous wars the War Office has been accustomed to rely for all such supplies

[1] *Parliamentary Debates* (1915) *H. of C.*, LXX, 1275. [2] *Times*, 31 March, 1915.

upon the Master-General of the Ordnance, who was wont to figure as a sort of Universal Provider. In this unprecedented war the Government ought to have insisted upon the instant organisation of the whole of our national resources, leaving the War Office to state its requirements and raise its armies."

The critics of the War Office failed, as was natural, to take into account the circumstances which had brought about the breakdown of supply, which, since they arose from the unprecedented and unforeseen scale of the demand, must have been encountered in some degree by the men who undertook to organise the supply of munitions during the first year of the war, whether those men had been officials of the War Office or had held, from the first, an independent status. The policy, deliberately adopted, of organising the resources of the country through the armament firms, had much in its favour. The fact remains that the armament firms were at the outbreak of war the only firms with actual experience of munitions manufacture; ordinary engineering firms could not take up such work at a moment's notice when there was little or no organisation at headquarters for instructing and supervising them; and it was to a great extent the education in shell making which such firms received as sub-contractors to the armament firms which enabled them in the summer of 1915 to organise their own resources on a wider and more independent basis. Thus it does not follow, because the country in the summer of 1915 was ripe for industrial mobilisation on the lines followed by the Armaments Output Committee and the Ministry of Munitions, that such industrial mobilisation could have been successfully carried out in August, 1914.

Moreover, the shortage of ammunition—the primary reason for the handing over of supply to a new Department—since it was brought about by arrears of deliveries rather than by lack of orders was to a certain extent remedied by time alone. The real achievement of the War Office was the creation of capacity to meet the demands of the 30-division standard contemplated in the autumn of 1914; the true results of their labours are more fairly represented by the supply position of December, 1915, than by that of May, 1915.[1] The time needed for the creation of new capacity, though uniformly disappointing the expectations of those responsible, differed little in fact from that which the large experience of the Ministry of Munitions showed to be the normal time required for the development of bulk output from new sources of supply.

None the less, the view of the public, as indicated in the above extracts, reflected an instinctive appreciation of the facts. The existing machinery of supply was strained to breaking point, despite the strenuous and unremitting labours of the Master-General of the Ordnance and his staff. The armament contractors were in arrears with their deliveries; their sub-contractors had been unable to give the expected assistance. The Royal Ordnance Factories were thus compelled to carry a disproportionate share of the load of bulk supply, a situation which was bound to react injuriously upon their other vital duties

[1] See Appendices III and IV.

in regard to experimental and specialised manufacture and the balancing and co-ordination of output as a whole. Moreover, they were ill-equipped for certain classes of work which now became of outstanding importance, such as the filling of heavy shell with new kinds of high explosive. Every branch of the Arsenal's activities had become intolerably congested in consequence of the fact that it was the chief national munitions factory as well as the headquarters of all work connected with stores, inspection and experimental manufacture. Geographical limitations made further extension difficult, while the long piecemeal development of bygone years was a heritage full of embarrassments.

A new departure was necessary. All the indications pointed to the need for vesting the responsibility for the supply of munitions in a new separate authority, for entrusting the task of mobilising the industrial resources of the country as a whole to a department specially equipped and unhampered by precedent. Only so could the development of new sources of supply, whether by the creation of new arsenals or the organisation of private industry, be effectively secured.

By the second week in April the first steps in this direction had already been taken. On 31 March, as has been seen, Lord Kitchener had appointed the Armaments Output Committee, the original functions of which were, it is true, confined to the provision of labour for munitions work but which in fact took the leading part in the organisation of local resources for shell manufacture. On 8 April the appointment of a second committee was announced—the Munitions of War or Treasury Committee, under the chairmanship of Mr. Lloyd George, then Chancellor of the Exchequer. A week later, Mr. Asquith, in announcing the names of the members in the House of Commons, stated that the decision to appoint such a committee had in fact been taken a month before, but that the ground had had to be prepared for its activities. He explained that its functions were " to ensure the promptest and most efficient application of all the available productive resources of the country to the manufacture and supply of munitions of war for the Navy and the Army."

The work of this committee and of the Armaments Output Committee, the adoption of a scheme for organising production on new lines, and the development of a central department for supplying munitions form the subject of a separate part.[1] The Munitions of War Committee was in fact an embryo Ministry of Munitions. With its appointment the end of the administration of supply by the War Office was in sight ; and on 26 May the announcement was made that the Government had decided to create a new Department of State to take over from the War Office the duty of supplying munitions to the Army.

---

[1] Vol. I, Part III.

APPENDICES.

APPENDIX I.

(CHAPTER II, p. 55.)

Form of Contract and Schedule as issued in August, 1914.

(Army Form K. 1271.)

STORES AND MATERIALS.

Messrs. ....

Notices and Instructions to Persons Tendering.

1. *Lowest Tender not necessarily to be accepted.*—The Secretary of State for War does not bind himself to accept the lowest or any Tender.

2. *Power to accept portion of Tender.*—The Secretary of State for War reserves the power, unless the Contractor expressly stipulates to the contrary in his Tender, of accepting such portion thereof as he may think fit.

3. *Delivery of Tender.*—This Tender is to be delivered at the War Office by 12 *o'clock noon*, on ..... in the enclosed envelope, addressed to " The Director of Army Contracts, War Office, Whitehall, London, S.W.," and marked on the outside, " Tender for..... ....."

4. *Prices.*—The prices quoted should be " net," all discounts being allowed for in the quotations.

5. *Schedule not to be altered by Contractor.*—The Schedule issued with this Form of Tender must not be altered by the Contractor. Any modification of the Schedule considered expedient by the Contractor should form the subject of a separate letter to accompany the Tender.

6. *Incomplete Tenders.*—Tenders may not be considered if complete information be not given at the time of tendering, or if the particulars and data (if any) asked for in the Schedule be not fully filled in.

7. *Rendering of Accounts, &c.*—Upon receipt of a notification that articles have been accepted, the Contractor is to put forward his Account or Bill. Payment will, as a rule, be made within 16 days after the receipt of a correct Bill.

Application for the necessary invoice and bill forms, or for instructions as to delivery or as to rendering of claims, should be made to the Receiving Officer at the place named in the Schedule.

8. *Notification of result of Inspection.*—Unless otherwise provided in the Specification or Schedule, the examination of the articles will be made as soon as practicable after receipt, and the result of the examination will be notified to the Contractor.

9. *Sample deliveries.*—Small sample deliveries, if specially so marked and submitted in separate parcels, together with invoice, will be inspected within a few days of receipt, and the result of the inspection will be notified immediately to the Contractor.

10. *Samples.*—When practicable, samples will, on application, be lent to the accepted Contractor for his general guidance ; the cost of carriage both ways must be borne by the Contractor.

11. *Port of London Dues.*—Goods entering or leaving the Port of London in the course of delivery under a War Office contract are exempt from Port Dues.

To secure such exemption the Contractor should obtain from the Port of London Authority the proper forms of certificate of exemption, and send them *in duplicate* to the consignee with the necessary particulars duly filled in.

If the transaction is in order, the consignee will sign and return the certificate to the Contractor, who should present it to the Port of London Authority.

12. *Port of London Wharfage and Porterage charges.*—In the case of stores delivered under a War Office contract, f.o.b. London, the Port of London Authority allow a rebate of one-third of the wharfage and porterage charges made by them; this rebate should be allowed for in the tender price.

To His Majesty's Principal Secretary of State for the War Department.

Sir,—

We, the undersigned (hereinafter styled "the Contractor"), do hereby engage to provide and deliver the several articles enumerated in the Schedule hereunto annexed, to which we have affixed prices (or such portion thereof as, in accordance with the power reserved by you, you may determine), at the price or prices therein stated, and upon the Conditions herein and in the Specification set forth. The work to be performed under this Contract will be carried out at our premises situated at .....

Dated this ..... day of 19

Witness..... Signature of Contractor } .....

Address..... Address .....

....

Conditions of Contract.

1. *Description and delivery of the Stores.*—The articles required shall be of the qualities and sorts described, and equal in all respects to the Patterns, Specifications, Drawings and Samples specified in the Schedule; and shall be delivered by the Contractor, at his own expense, at the time or times specified, into the charge of the Officer at the place named in the Schedule. An Invoice (*see* Instruction No. 7 above) shall be sent to the Officer as soon as any articles have been despatched.

2. *Inspection and Rejection.*—(*a*) The articles, before being received into Store, shall be examined, and if found inferior in quality to, or differing in form or material from the Patterns, Specifications, Drawings or Samples specified in the Schedule, may be rejected. Such rejected articles shall not be considered as having been delivered under the Contract, but the Contractor shall, if required to do so by the Secretary of State for War, replace the same at his own expense without any allowance being made to him.

(*b*) Articles so rejected shall be removed by the Contractor at his own expense, within eight days of the date of the notification of the rejection. In the event of the Contractor failing to remove them, or any of them, within such period, the Secretary of State for War at his sole discretion shall be at liberty either to return the rejected articles, carriage forward, by such mode of transit as he may select, or to sell them by public auction or by private contract on the Contractor's behalf, and to retain such portion of the proceeds as may be necessary to cover any loss or expenses incurred by the War Department in connection with the said sale.

3. *Payment.*—Payment will be made direct to the Contractor, or to an Agent or Attorney, duly authorised to receive payment by the Contractor in writing or by a revocable power of attorney. The Secretary of State for War will not recognise any assignment other than is before mentioned of moneys due or to become due under this Contract, and neither Section 25 (6) of the Judicature Act, 1873, nor Section 28 (6) of the Supreme Court of Judicature (Ireland) Act, 1877, shall apply to this Contract or to moneys due or to become due thereunder.

4. (*a*) *Damages for Delay.*—Should the articles or any portion thereof not be delivered within the period or periods stipulated in the Schedule, whether by reason of the exercise by the Secretary of State for War of his power of rejection under Clause 2 or otherwise, the Contractor shall be liable by way of liquidated

damages for delay for a sum equal to 1 per cent. on the value on the articles deficient if the delay does not exceed thirty days, for 2 per cent. if the delay exceeds thirty days but does not exceed sixty days, and for 3 per cent. if the delay exceeds sixty days; such sum may at any time be deducted from any sum or sums then due, or which at any time thereafter may become due to him under this or any other Contract with this Department, or may be demanded of him to be paid within fourteen days to the Paymaster-General for credit to Army Funds.

(*b*) *Purchase in default.*—In addition to the above, if and whenever there may be any articles or any portion thereof deficient, the Secretary of State for War shall be at liberty to purchase other articles of the same or similar description from other persons to supply such deficiency; and in the event of any excess cost being incurred by reason of any difference between the price paid for the same and the Contract price, to charge the amount of such excess cost to the Contractor, and the sum so charged shall, at the option of the Secretary of State for War, be deducted and paid in like manner as the liquidated damages hereinbefore mentioned.

(*c*) *Termination of Contract.*—The Secretary of State for War shall also be at liberty to terminate the Contract at, or after, any one of the specified periods, at which default shall have been made, either wholly or to the extent of such default, without prejudice to his remedies under paragraphs (*a*) and (*b*) of this Clause.

5. *Contractor's responsibility for Government Property.*—The Contractor guarantees the due return of all Government property issued to him, and will be responsible to the full value of such property, to be assessed by the Secretary of State for War, for all loss or damage from whatever cause happening thereto while in the possession or control of himself, his servants or agents.

6. *Principals or Partners to be notified.*—The Contractor shall furnish within seven days after the notification to him of the acceptance of the Tender, to the Secretary of State for War, unless such information shall have been given previously, the names of all the persons who are at the time principals to the contract or partners in the Contracting Firm, or, in the case of a Company with limited liability, the names of all the Directors. In case of any change occurring in such principals, partners or directors, during the currency of the Contract, the Contractor shall notify such change to the Secretary of State for War within fourteen days from the date thereof. In the event of any breach of this clause the Secretary of State for War may terminate the Contract forthwith, and may recover from the Contractor any loss resulting from such termination.

7. (*a*) *Fair Wages, Transfer of Contract, and Sub-letting.*—The Contractor shall, in the execution of this Contract, observe and fulfil the obligations upon contractors specified in the Resolution passed by the House of Commons on the 10 March, 1909, namely:—

> "The Contractor shall . . . pay rates of wages and observe hours of labour not less favourable than those commonly recognised by employers and trade societies (or, in the absence of such recognised wages and hours, those which in practice prevail amongst good employers) in the trade in the district where the work is carried out. Where there are no such wages and hours recognised or prevailing in the district, those recognised or prevailing in the nearest district in which the general industrial circumstances are similar shall be adopted. Further, the conditions of employment generally accepted in the district in the trade concerned shall be taken into account in considering how far the terms of the Fair Wages Clauses are being observed. The Contractor shall be prohibited from transferring or assigning, directly or indirectly, to any person or persons whatever, any portion of his contract without the written permission of the Department. Sub-letting, other than that which may be customary in the trade concerned shall be prohibited. The Contractor shall be responsible for the observance of the Fair Wages Clauses by the sub-contractor."

(*b*) *Exhibition of Notice at Works.*—The Contractor shall cause the preceding condition to be prominently exhibited for the information of his workpeople, on the premises where work is being executed under the contract.*

---

* Forms of Notice for exhibition may be obtained on application to the Director of Army Contracts, War Office, London, S.W.

(c) *Inspection of Wages Books, etc.*—The Contractor shall keep proper wages books and time sheets, showing the wages paid, and the time worked by the workpeople in his employ in and about the execution of the Contract, and such wages books and time sheets shall be produced whenever required for the inspection of any officer authorised by the Department.

8. *Bribery.*—Any bribe, commission, gift, loan or advantage given, promised or offered by, or on behalf of, the Contractor, or his partner, agent, or servant, in relation to the obtaining or to the execution of this or any other Contract for His Majesty's service, or given, promised, or offered by, or on behalf of, the Contractor, or his partner, agent, or servant, to any officer or person in the service or employ of the Crown, who shall be in any way connected with the obtaining or the execution of this or any other Contract, subjects the Contractor to cancellation of this Contract, and also to payment of any loss resulting from any such cancellation. Where any such bribe, commission, gift, loan, or advantage, has been given or promised in relation to the obtaining or the execution of this Contract, or to any officer or person in the service or employ of the Crown who shall be in any way connected with the obtaining or the execution of this Contract, the Contractor shall also be liable to pay by way of liquidated damages a sum equal to 10 per cent. of all the sums which become payable to him under this Contract. Any question or dispute as to a breach of this Article, or the sums to be paid, is to be settled by the Secretary of State for War, in such manner, on such evidence or information, as he thinks fit, and his decision is to be final.

9. *Bankruptcy.*—The Secretary of State for War, in addition to any power which he may have under this Contract of terminating the same, may also at any time terminate the Contract if, under any present or future Bankruptcy Act, any receiving order or order for administration shall be made in respect of the Contractor's estate, or if the Contractor shall enter into, make or execute any deed of arrangement as defined by the Deeds of Arrangement Act, 1887, or other composition or arrangement with, or assignment for the benefit of, his creditors, or purport so to do ; or if (in Scotland) he become insolvent or notour bankrupt, or application be made under any present or future Bankruptcy Act for sequestration of his estate, or application be made by him or any of his creditors for cessio bonorum against him, or a trust deed be granted by him for behoof of creditors ; or in the case of a Company (in any part of the United Kingdom) in the event of the passing of any effective resolution or the making of any order for winding up, whether voluntary or otherwise.

10. *Members of the House of Commons.*—In pursuance of the House of Commons (Disqualification) Act, 1782 (22 Geo. III., cap. 45), and under the pain of the penalties therein mentioned, no member of the House of Commons shall be admitted to any part or share of this Contract, or to any benefit to arise therefrom, contrary to the true intent and meaning of the said Act.

APPENDIX II.

(CHAPTER II, p. 65.)

Orders placed with the Trade 1913–14, and August, 1914–July, 1915.[1]

Description of Store.	Number Ordered.	
	1913–1914.	Aug. 1914–July 1915.
Guns :—		
12 in. Howitzers	—	40
9·2 in. Guns	—	4
9·2 in. Howitzers	—	36
8 in. Howitzers	—	11
6 in. Guns	4	—
6 in. Howitzers	—	16
4·5 in. Howitzers	—	650
3 in. Guns	—	12
60-pdr. Guns	—	72
18-pdr. ,,	—	3,380
13-pdr. ,,	—	18
1-pdr. ,,	—	27
Mortars	—	200
Bomb-throwers	—	200
Gun Carriages and Mountings :—		
12 in. Howitzer Mountings	—	40
9·2 in. ,, ,,	—	36
4·5 in. Equipments	—	650
18-pdr. ,,	—	3,380
13-pdr. ,,	—	18
Gun Equipment :—		
Springs, Running out	976	21,123
Wheels, Artillery	—	5,116
Poles, Draught	—	12,157
Bars supporting Draught Poles	—	9,044
Miscellaneous Items	£923	£273,227
Optical Munitions :—		
Sights, Dial No. 7	456	3,602
,, ,, No. 1.	—	2,150
,, Rocking Bar	—	591
Adapters, Dial Sight	—	750
Carriers, ,, ,,	24	3,820
Indicators, Fuse	—	5,140
Gun Ammunition :—		
Shell 12 in. H.E.	—	40,400
,, 9·2 in. A.P.	991	7,901
,, 9·2 in. H.E.	806	139,886
,, 8 in. H.E.	—	188,300
,, 6 in. A.P.	—	10,300
,, 6 in. H.E.	—	767,420
,, 6 in. Shrapnel	—	12,300
,, 6 in. C.P.	—	150
,, 5 in. H.E.	—	202,524
,, 5 in. Shrapnel	—	40,500
,, 4·7 in. H.E.	—	356,200
,, 4·7 in. Shrapnel	—	54,500
,, 4·5 in. H.E.	(*a*)459	(*a*)3,266,250

[1] Orders for warlike stores placed by A6 and A7. (HIST. REC. R/170/15).

APPENDIX II—*contd.*

Description of Store.	Number Ordered. 1913–1914.	Aug. 1914–July 1915.
Shell 4·5 in. Shrapnel	650	420,000
,, 4·5 in. Common	500	372
,, 4 in. H.E.	—	6,900
,, 2·95 in. Double	—	4,500
,, 2·75 in. H.E.	—	99,000
,, 2·75 in. Shrapnel	22,950	9,000
,, 60-pdr. Shrapnel	—	156,300
,, 60-pdr. H.E.	—	388,850
,, 18-pdr. ,, ...	(*a*)—	(*a*)5,887,000
,, 18-pdr. Shrapnel	(*a*)—	(*a*)4,565,783
,, 18-pdr. Common	—	9,000
,, 15-pdr. H.E.	—	180,000
,, 15-pdr. Shrapnel	—	898,800
,, 13-pdr. H.E.	(*a*)—	(*a*)190,000
,, 13-pdr. Shrapnel	(*a*)—	(*a*)234,500
,, 12-pdr. and 14-pdr. Lyddite ..	—	24,800
,, 10-pdr. Shrapnel	—	700
,, 2-pdr. N.T.	—	500
Total Shell	26,356	18,113,636
Proof Shot, 9·2 in.	—	600
,, ,, 6 in.	—	6,900
,, ,, 4·7 in.	—	5,000
,, ,, 4·5 in.	—	23,000
,, ,, 4 in.	—	2,250
,, ,, 60-pdr.	—	5,100
,, ,, 18-pdr.	—	92,700
,, ,, 13-pdr.	—	7,900
,, ,, 12-pdr. 12 cwt.	—	6,500
Proof Shell, 6 in.	—	2,600
,, ,, 4·5 in.	—	3,750
,, ,, 60-pdr.	—	4,500
,, ,, 18-pdr.	—	14,000
,, ,, 15-pdr.	—	10,000
,, ,, 13-pdr.	—	1,500
Practice Projectile :—		
9·2 in.	500	—
6 in.	200	—
5 in.	—	960
4·7 in.	—	6,500
4·5 in.	500	1,000
12-pdr. and 14-pdr.	—	1,000
Cartridges, Complete Rounds :—		
4·5 in. Howitzer	—	1,866,000
3 in.	—	6,000
18-pdr. Shrapnel	2,400	11,067,000
18-pdr. H.E.	—	8,417,000
13-pdr. H.E.	—	100,000
13-pdr. Shrapnel	7,320	—
2-pdr.	—	1,500
1-pdr.	—	21,000
Total. Complete Rounds ..	9,720	21,478,500

(*a*) See also complete rounds below.

APPENDIX II—*contd.*

Description of Store.	Number ordered.	
	1913–1914.	Aug. 1914–July 1915.
Bombs :—		
Aeroplane	—	14,370
Trench Mortar	—	151,000
Signal	—	7,715
Cartridge Cases :—		
6 in. short	—	1,000
4·7 in.	—	286,950
4·5 in.	1,100	4,088,200
4 in.	—	2,800
18-pdr.	—	9,305,900
12-pdr. 12 cwt.	—	10,150
2-pdr.	—	500
Fuses :—		
No. 17	—	205,300
No. 44	—	1,697,000
No. 63	11,000	—
No. 65A	4,000	1,725,000
No. 80	38,600	8,707,533
No. 82	10,000	397,000
No. 83	—	5,400
No. 85	—	200,000
No. 86	—	175,000
No. 100	—	9,427,800
Primers	82,350	10,046,549
Gaines	—	12,524,400
Tubes, Friction	—	1,603,750
,, Vent Sealing	—	201,900
Machine Guns :—		
Vickers ·303 in.	41	3,792
Lewis ·303 in.	2	3,052
Machine Rifles	—	500
Rifles :—		
·303 in.	42,500	3,045,062
,, altered	—	162,000
Converted to 22 in.	5,860	9,329
Pistols	1,159	70,400
Rifle Stocks :—		
Butts	3,000	94,450
Fore Ends	15,000	102,108
Handguards, Front	120,300	109,900
,, Rear	76,000	36,000
Longstocks	94,500	198,477
Lances	—	1,050
Swords, Cavalry	—	40,250
Tulwars	—	5,550
Swords, Artillery	—	2,000
,, Practice	—	1,500
Bayonets	—	3,286,800
Small Arms Ammunition :—		
·303 in. Ball	53,085,527	2,307,360,000
·303 in. Blank	19,585,700	12,360,000
Japanese	—	16,000,000
Snider	59,000	—
7·9 mm.	—	1,315,000
Aiming Tube	1,100,000	1,100,000
·22 in.	34,888,300	572,500,000

APPENDIX II—*contd.*

Description of Store.	Number ordered. 1913–1914.	Aug. 1914–July 1915.
Small Arms Ammunition.—contd		
Pistol Ammunition	849,936	39,465,735
Cartridge Chargers	11,000,000	432,772,500
Detonators for Fuse	41,785	1,906,872
Grenades, Hand	—	4,722,625
,, Rifle	100	363,650
Pistols, Signal	120	18,545
Explosives, etc. :—		
*Ballistite	—	460 tons
*Cordite	455 tons	14,430 ,,
*Gun Cotton	—	2,310 ,,
*Gun Powder	74,100 lbs.	1,940,000 lbs.
*Nitrocellulose Powder	—	14,702 tons
*Acetone	280 tons	10,915 ,,
*Glycerine	168 ,,	750 ,,
*Nitric Acid	—	1,500 ,,
*Sulphuric Acid	2,000 ,,	42,120 ,,
*Benzol	—	79,300 galls.
*Dimethyl Analine	—	117 tons
*Mineral Jelly	100 ,,	260 ,,
*Saltpetre	—	1,650 ,,
*Soda Nitrate	2,270 ,,	22,730 ,,
*Soda Ash	175 ,,	150 ,,
*Sulphur Grough	—	350 ,,
*Toluol	—	270,860 galls.
*Cotton Waste	600 ,,	8,644 tons
		Aug. 8, 1914–Dec. 12, 1914.
*Picric Acid	139 ,,	3,454 tons
*Trinitrotoluene	239 cwt.	118,711 cwt.
		Aug. 1914–July 1915.
Scientific Instruments, etc. :—		
Fire Control Apparatus	—	18
Observation of Fire Apparatus	16	50
Barometers	—	1,112
Binoculars, Prismatic	3,082	58,375
,, Galilean	—	6,578
Clinometers	264	18,105
Compasses	2,987	54,544
Directors	175	3,980
Heliographs	143	4,828
Angle of Sight Instruments	95	796
Levels	—	3,575
Mekometers	1,376	2,600
Periscopes	—	26,325
Plotters	15	2,370
Artillery Rangefinders	129	592
Infantry ,,	157	5,058
Telemeters	—	224
Telescopes	835	14,297
Theodolites	1	100
Thermometers	622	2,402

* From December, 1914, these stores were transferred to the Explosives Department.

APPENDIX III.

(CHAPTER V, p. 134.)

Number of Shell ordered by the War Office for use in the Field[1] and position with regard to delivery on 31 December, 1914, and 29 May, 1915.

Note.—The following table deals with the principal types of service shell only, and does not include proof shot, common shell, etc., or shell intended for fixed armaments. A number of the orders placed from January, 1915, onwards were standing orders for a fixed monthly or weekly output; in these cases the total due for delivery to the end of 1915 has been taken. The figures for both orders and arrears are in some cases approximate only. The terms of delivery were not always precisely formulated when orders were given, subsequent modifications were frequently made and orders were sometimes postponed in favour of others. It is, therefore, not always possible to estimate exactly the total quantity ordered, or the quantity due for delivery at a given date.[2]

Nature.	Position on 31/12/14.			Position on 29/5/15.		
	Total ordered.	Delivered.	Arrears.	Total ordered.	Delivered.	Arrears.
12-*in. How.*—						
H.E.—Trade ..	32,000	–	–	32,000	–	7,500
U.S.A. ..	–	–	–	10,000	–	–
Total ..	32,000	–	–	42,000	–	7,500

[1] In addition to the orders placed by the War Office, by 29 May, 1915, orders had been arranged by the Armaments Output Committee with Local Munitions Committees and National Shell Factories as follows:—

Maker.	*Total Ordered.*	*Weekly Output.*
18-*pdr.*—		
Birmingham	30,000 ..	1,000
Huddersfield	56,000 ..	2,000
Dundee	150,000 ..	5,000 to 10,000
Keighley	105,000 ..	5,000
Derby	105,000 ..	5,000
Coventry	100,000 ..	10,000
Total	546,000	
4·5-*in.*—		
Leicester	23,000 ..	500 to 1,000
Birmingham	275,000 ..	13,000
Leeds	105,000 ..	3,000 to 5,000
Hull	40,000 ..	2,000 to 5,000
Bradford	60,000 ..	2,000 to 4,000
Coventry	10,000 ..	500
Total	513,000	

It is not possible to estimate accurately the total amount of these orders, most of them being dependent upon the creation of capacity, working up to a given weekly output, the date of which was indeterminate. A number of schemes in addition to those here shown were under negotiation at the end of May, 1915.

[2] The figures are taken mainly from the *Lists of Orders for all Natures of Ammunition used in the Field* (A.2. War Office) and from *Gun Ammunition, Components, Accessories, etc., ordered by War Office from the Trade* (A. 7. War Office).

APPENDIX III—*contd.*

Nature.	Position on 31/12/14.			Position on 29/5/15.		
	Total ordered.	Delivered.	Arrears.	Total ordered.	Delivered.	Arrears.
9·2-*in. How.*—						
H.E.—Trade ..	63,200	548	1,052	85,775	7,082	18,993
U.S.A.	–	–	–	42,000	–	–
Total ..	63,200	548	1,052	127,775	7,082	18,993
8-*in. How.*—						
H.E.—Trade ..	94,800	–	–	149,300	118	7,082
U.S.A.	–	–	–	39,000	–	2,700
Total ..	94,800	–	–	188,300	118	9,782
6-*in. How.*—						
H.E.—Trade ..	248,400	–	1,500	313,400	123	50,077
U.S.A.	52,000	–	–	277,000	6,720	31,280
Total ..	300,400	–	1,500	590,400	6,843	81,357
Shrapnel—Trade ..	12,000	–	240	12,000	–	8,280
5-*in. How.*—						
H.E.—Trade ..	400	–	–	400	–	400
U.S.A.	20,000	–	–	95,000	1,752	–
Total ..	20,400	–	–	95,400	1,752	400
Shrapnel—Trade	30,000	–	9,900	30,000	4,573	25,427
60-*pdr.*—						
H.E.—O.F. ..	20,200	5,213	–	20,200	5,278	–
Trade	117,250	5,145	11,079	207,850	37,804	76,796
Canada	–	–	–	300,000	–	–
U.S.A.	–	–	–	60,000	–	–
Total ..	137,450	10,358	11,079	588,050	43,082	76,796
Shrapnel—O.F. ..	21,800	7,156	–	31,300	22,325	3,175
Trade	101,300	6,792	11,908	156,300	45,065	49,936
Total ..	123,100	13,948	11,908	187,600	67,390	53,111
4·7-*in.*—						
H.E.—Trade ..	235,400	390	1,900	235,400	2,546	69,304
U.S.A.	30,000	–	–	120,800	–	30,500
Total ..	265,400	390	1,900	356,200	2,546	99,804
Shrapnel—Trade	24,500	–	–	24,500	–	9,750
U.S.A.	30,000	–	–	30,000	14,548	13,452
Total ..	54,500	–	–	54,500	14,548	23,202
4·5-*in.*—						
H.E.—O.F. ..	49,600	14,745	–	76,600	34,509	3,791
Trade	426,900	4,469	21,080	1,010,400	57,430	182,413
Canada	–	–	–	700,000	–	50,000
U.S.A.	–	–	–	575,000	–	45,000
Complete Rds.—						
Canada	–	–	–	1,866,666	–	–
Total ..	476,500	19,214	21,080	4,228,666	91,939	281,204

APPENDIX III—*contd.*

Nature.	Position on 31/12/14.			Position on 29/5/15.		
	Total ordered.	Delivered.	Arrears.	Total ordered.	Delivered.	Arrears.
4·5-in.—cont.						
Shrapnel—O.F. ..	54,540	648	–	54,540	1,417	–
Trade	313,000	17,360	14,290	400,000	45,703	134,447
Total ..	367,540	18,008	14,290	454,540	47,120	134,447
18-*pdr.*—						
H.E.—O.F. ..	50,000	–	–	122,000	30,981	13,019
Trade	238,000	–	–	3,373,000	8,152	111,848
Canada	–	–	–	125,000	–	–
U.S.A.	–	–	–	2,050,000	27,492	217,508
Total ..	288,000	–	–	5,670,000	66,625	342,375
Complete Rds.—						
O.F.	20,000	8,992	–	20,000	19,990	–
Trade	400,000	–	–	400,000	–	100,000
Canada	–	–	–	3,266,666	–	200,000
U.S.A.	–	–	–	4,750,000	–	–
Total ..	420,000	8,992	–	8,436,666	19,990	300,000
H.E. Total (incl. complete Rds.) ..	708,000	8,992	–	14,106,666	86,615	642,375
Shrapnel—O.F. ..	538,440	46,815	–	638,440	124,345	8,766
Trade	2,734,283	143,996	197,003	3,139,283	608,375	625,908
Canada	500,000	3,294	76,706	625,000	389,966	60,034
U.S.A.	100,000	–	–	100,000	69,684	–
Total ..	3,872,728	194,105	273,709	4,502,723	1,192,370	694,708
Complete Rds.—						
Trade	600,000	–	–	600,000	–	100,000
Canada	1,100,000	–	–	3,466,666	21,132	778,868
U.S.A.	1,000,000	–	–	7,250,000	165,884	184,116
India	60,000	15,000	–	60,000	22,500	37,500
Total	2,760,000	15,000	–	11,376,666	209,516	1,100,484
Shrapnel Total (incl. complete Rds.) ..	6,632,723	209,105	273,709	15,879,389	1,401,886	1,795,192
15-*pdr.*—						
H.E.—Trade ..	–	–	–	180,000	–	25,000
Shrapnel—O.F. ..	11,000	–	–	11,000	–	5,500
Trade	598,800	–	46,000	598,800	9,207	259,593
Canada	100,000	–	50,000	300,000	62,292	37,708
Total ..	709,800	–	96,000	909,800	71,499	302,801
13-*pdr.*—						
H.E.—Trade ..	–	–	–	40,000	–	4,500
U.S.A.	50,000	–	–	150,000	15,394	74,606
Complete Rds.—						
Canada	–	–	–	100,000	–	–
Total	50,000	–	–	290,000	15,394	79,106

APPENDIX III—*contd.*

Nature.	Position on 31/12/14.			Position on 29/5/15.		
	Total ordered.	Delivered.	Arrears.	Total ordered.	Delivered.	Arrears.
13-pdr.—cont.						
Shrapnel—O.F. ..	94,000	17,643	–	194,000	75,212	–
Trade	182,000	3,079	11,921	182,000	23,153	137,755
Complete Rds.—						
India	7,000	–	7,000	14,000	7,500	6,500
Total	283,000	20,722	18,921	390,000	105,865	144,255
2·75-*in.*—						
H.E.—Trade ..	21,000	–	–	82,500	–	16,000
Shrapnel—O.F. ..	3,260	965	–	3,260	1,676	–
Trade	4,000	450	3,550	9,000	2,629	1,371
Total	7,260	1,415	3,550	12,260	4,305	1,371
Total H.E.—						
O.F.	139,800	28,950	–	238,800	90,758	16,810
Trade	1,877,350	10,552	36,611	6,110,025	113,255	669,913
Canada	–	–	–	6,358,332	–	250,000
U.S.A.	152,000	–	–	8,168,800	51,358	401,594
India	–	–	–	–	–	–
Total	2,169,150	39,502	36,611	20,875,957	255,371	1,338,317
Total Shrapnel—						
O.F.	723,040	73,227	–	932,540	224,975	17,441
Trade	4,599,883	171,677	294,812	5,151,883	738,706	1,352 467
Canada	1,700,000	3,294	126,706	4,391,666	473,390	876,610
U.S.A.	1,130,000		–	7,380,000	250,116	197,568
India	67,000	15,000	7,000	74,000	30,000	44,000
Total	8,219,923	265,835	428,518	17,930,089	1,717,187	2,488,086
Total H.E. and Shrapnel—O.F.	862,840	102,177	–	1,171,340	315,733	34,251
Trade	6,477,233	182,229	331,423	11,261,908	851,960	2,022,380
Canada	1,700,000	3,294	126,706	10,749,998	473,390	1,126,610
U.S.A.	1,282,000	–	–	15,548,800	301,474	599,162
India	67,000	15,000	7,000	74,000	30,000	44,000
Grand Total ..	10,389,073	302,700	465,129	38,806,046	1,972,558	3,826,403

APPENDIX IV.

(CHAPTER V, p. 134.)

Aggregate Deliveries of the Principal Natures of Shell to 31 December, 1915, distinguishing those on War Office and Ministry of Munitions Orders.[1]

Nature of Shell.	Deliveries on W.O. Account.	Deliveries on M.M. Account.	Total Deliveries.
15-in. How. H.E.	426	—	426
12-in. How. H.E.	8,846	—	8,846
9·2-in. How. H.E. ..	50,677	1,040	51,717
8-in. How. H.E.	71,278	—	71,278
6-in. Gun or How. H.E. ..	220,988	2,475	223,463
5-in. Howitzer—			
H.E.	155.192	—	155,192
Shrapnel	11,939	—	11,939
4·7-in.—			
H.E.	88,596	—	88,596
Shrapnel	25,215	—	25,215
60-pdr.—			
H.E.	102,421	115,305	217,726
Shrapnel	181,957	6,940	188,897
4·5-in. Howitzer—			
H.E.	1,127,062	147,140	1,274,202
Shrapnel	264.989	3,163	268,152
18-pdr.—			
H.E.	3,861,478	568,498	4,429,976
Shrapnel	6,855,790	1,774,284	8,630,074
15-pdr.—			
H.E.	103,560	63,000	166,560
Shrapnel	147,037	—	147,037
13-pdr.—			
H.E.	182,864	32,623	215,487
Shrapnel	270,674	—	270,674
2·75-in.—			
H.E.	11,034	—	11,034
Shrapnel	4,410	—	4,410
Total[2] ..	13,746,433	2,714,468	16,460,901

[1] HIST. REC./H/1300/6 and 12.

[2] As will be seen by a comparison with the table in Appendix III, the total deliveries at this date did not by any means equal the total of the War Office orders (38,806,046). This figure was, however, practically reached by the end of April, 1916, when the total deliveries on all orders amounted to 38,475,900.

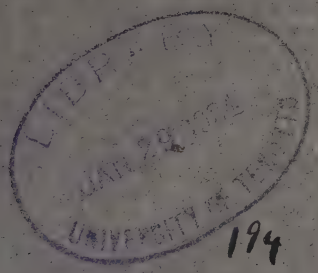
HISTORY OF THE MINISTRY OF MUNITIONS

VOLUME I

INDUSTRIAL MOBILISATION, 1914-15

PART II

THE TREASURY AGREEMENT



Volume I

INDUSTRIAL MOBILISATION, 1914–15

PART II

THE TREASURY AGREEMENT

CONTENTS.

CHAPTER I.

The Supply of Armament Labour.

(474) Wt 3643/A.P.5036 10/18 250 D.St.

CHAPTER II.

The Relaxation of Trade Union Restrictions, August, 1914, to February, 1915.

CHAPTER III.

The Control of Industry and the Limitation of Profits.

CHAPTER IV.

The Treasury Agreement.

APPENDICES.

INDEX.

CHAPTER I.

THE SUPPLY OF ARMAMENT LABOUR.

I. The Demand for Armament Labour.

At the outbreak of war no general shortage of labour was anticipated. Within the first week, the Cabinet Committee on the Prevention and Relief of Distress invited the Mayors and Provosts throughout the Country to form local committees to provide against unemployment. The Local Government Board urged local authorities to expedite public works and to frame schemes which might be put in hand if serious distress should arise. The Executives of the Engineering Employers' Federation and of the Amalgamated Society of Engineers met on 19 August, 1914, "to discuss ways and means whereby the unemployment contingent upon the national crisis may be minimised." The employers proposed to reduce overtime, to introduce night shifts, and to work short time in preference to discharging workmen. Even the Director of Army Contracts drew up a *Memorandum as to minimising Unemployment during the War*,[1] copies of which were attached to some of the tender forms issued in August for articles other than warlike stores.

As early as mid-September, however, the information received by the Board of Trade showed that the total unemployment was not very great. On the other hand, a considerable and increasing dislocation of labour had already been caused by enlistment. At that time there was a strong demand for labour both in country districts where recruiting had been specially heavy, and on the part of contractors to public Departments who had just received fresh contracts.[2]

For armament work alone, some indication of the extent of the demand is given by the fact that some 18,000 workpeople of all classes were supplied through the Labour Exchanges to the Royal Factories and chief armament firms in the first five months of war (August-December, 1914).[3] In November there was an unsatisfied demand for 6,000 armament workers.[4]

At the Shell Conference of 21 December,[5] the outstanding fact which came to light was the grave shortage of skilled engineering labour that threatened to prevent nearly all the great firms from offering a substantial increase of production. Up to this time it does not appear

[1] See Appendix I.

[2] L.E. Department, C.O. Circ. 1607 (14/9/14).

[3] Large numbers of shipyard workers were also placed.

[4] L.E./48688.

[5] An account of this conference, at which the chief armament contractors were invited largely to increase their capacity and output of shells and fuses, is given in Part I.

that the principal armament contractors had had serious difficulty in finding enough skilled labour to man their existing plant. To a large extent they had been able to make good the losses due to enlistment by attracting men from smaller establishments. But by the end of the year, when the subsidised extensions of their works already in hand were beginning to mature, and they were asked at the Shell Conference still further to enlarge their capacity, one after another of their representatives intimated that any fresh offers they could make were conditional upon the supply of another 400, 500, or 600 skilled mechanics, besides much larger numbers of unskilled men and women. Nearly all of them said that they could not find this additional labour for themselves. For two of their establishments alone, Messrs. Armstrong stated their requirements in round numbers at 4,150 (1,950 at Alexandria, 2,200 at Elswick)[1]; Messrs. Vickers demanded 633 skilled men for Crayford, 133 for Erith, 814 for Barrow, 96 for Sheffield.[2]

At the Royal Factories, it had for some years been the settled policy to keep a reserve of producing capacity ready for immediate expansion in time of emergency, and to avoid large fluctuations in the numbers employed by allowing the surplus of orders to be taken up by the trade makers. At Woolwich, for example, it was laid down that the number of hands employed in the productive departments should lie between 7,700 and 8,300, as a sufficient nucleus to keep the shops in thorough working order. At the end of June, 1914, 8,500 were actually employed. The number required to keep all the machinery going on the basis of a normal day's work was estimated at 16,000. The same policy was pursued at Enfield. Thus the immediate requirements of the Royal Factories on the outbreak of war would be considerable.[3]

On 6 January, 1915, Sir Frederick Donaldson gave the following estimate of the numbers of men and boys that would be required in the Ordnance Factories at the Royal Arsenal in the next six months.[4]

	Jan.	Feb.	Mar.	April.	May.	June.
Skilled Workmen:						
Fitters	162	116	86	80	—	—
Turners	80	70	20	—	—	—
Machine hands ..	100	400	500	500	500	500
Others	51	46	25	—	—	—
Labourers	100	200	300	300	300	300
Boys	120	600	600	220	220	240

The Superintendent of the Royal Torpedo Factory at Greenock, on 13 January, stated that 700 skilled workmen were required to deal with urgent work on order for the Fleet, apart from labourers and

[1] L.E. Department, C.O. Circ. 1701 (5/1/15). These figures probably largely exceed the numbers that could have been actually employed, and were merely estimated in view of future extensions.

[2] C.O. Circ. 1707 (9/1/15).

[3] See *Report of the Select Committee on the Estimates* (5/8/14), pp. 215, 257.

[4] L.E. 1965/12A.

boys who could be found locally.[1] For the Government Dockyards and for shipbuilding firms employed on Government work the December returns showed an unsatisfied demand for nearly 8,000 men.

The actual shortage of labour and the difficulty of meeting additional demands for expansion were due mainly to the unrestricted enlistment of skilled workmen. Before considering the extraordinary measures taken by the Board of Trade in January, 1915, to meet the demand, some account will be given of the operation of this factor and of the earlier attempts to check the outflow of men from the engineering and shipbuilding industries into the Army.

II. The Enlistment of Skilled Workmen and the Problem of Man-power.

The effect of enlistment upon the engineering trades can be traced in the successive Board of Trade reports on employment. By October, 1914, the trades in this group had lost by enlistment 12·2 per cent. of their pre-war male workers. By February, 1915, the percentage had risen to 16·4 ; by July to 19·5.[2] It is true that against this gross loss must be set a rapidly increasing percentage of replacement by transference from other trades, shown in October, 1914, as 0·2 per cent. of the total number occupied before the War ; in February, 1915, as 7·4 ; in July, as 16·3. These offsets, however, so far from making up the extra numbers required to meet the expanding demand, did not suffice to keep the employment figure stationary. At the time of the formation of the Ministry, the number of engineers working had fallen below the figure for July, 1914, by 48,000, while the outstanding demand at two Government factories and sixteen firms doing munitions work amounted to nearly 14,000.

In the light of later experience, the problem of this drain into the Army of men taken from the industry most vital to munitions production has come to be regarded as only one aspect of the wider question of the distribution of man-power in general. Another aspect is presented by the conflicting claims of the Army and munitions production together as against the maintenance of commercial work, especially for export trade. A satisfactory solution implies a distinction between essential and unessential industries or products ; and Government intervention was needed alike to direct the flow of skilled labour towards armament work and to check the enlistment of the most responsible and intelligent, and therefore the most skilled, workmen.

Although, however, it may now be clear that the fundamental connection between these problems requires that they should be handled together, in the less stringent conditions which prevailed at the end of 1914 they were dealt with separately by distinct authorities, whose interests threatened to conflict. It was part of the duty of the Board of Trade to maintain production for export at a level high enough to keep up necessary imports and to secure the credit

[1] L.E. 1965/50.

[2] Tables showing the effect of enlistment on the industrial population are given in Appendix II.

of the Country. Enlistment was in the province of the Adjutant-General's department at the War Office, which had started by thinking of the new armies in hundreds of thousands, and, before the year 1914 was out, was beginning to think of them in millions. Munitions production was the concern of the Master-General of the Ordnance, whose department worked independently of the Adjutant-General's, both being subordinate only to the Secretary of State. The War Office at once looked with a jealous eye on schemes for protecting any industry from enlistment, and expected the Board of Trade to find skilled labour in ever increasing quantities for armament work.

Apart, however, from the divergent interests and rivalries of Departments, it is certain that forces were at work which would have defeated the closest co-operation of Government officials, not yet armed with powers of either military or industrial compulsion. Nor can it be altogether a matter for regret that a voluntary system of enlistment automatically selected for the first new armies the most spirited and adventurous men, rather than those who could best have been spared from the factory, the shipyard, or the mine.

Co-operation with regard to enlistment was established between the Board of Trade and the War Office towards the end of August, 1914, when the use of the Labour Exchanges was offered for recruiting purposes.[1] Posters and leaflets on the subject of recruiting the second Army of 100,000 were issued to managers on 2 September, and others were forwarded later. As early as the beginning of September, however, complaints had begun to flow in from employers whose works were being disorganised by the loss of pivotal men.

The proposal to issue badges was at first discountenanced by the War Office, and alternative expedients were considered. In response to a request from Messrs. Vickers for permission to issue a recognised badge to their men, Lord Kitchener replied on 8 September with the following letter :—

> " I wish to impress upon those employed by your Company the importance of the Government work upon which they are engaged. I fully appreciate the efforts which the employees are making, and the quality of the work turned out. I trust that everything will be done to assist the Military Authorities by pushing on all orders as rapidly as possible.
>
> " I should like all engaged by your Company to know that it is fully recognised that they, in carrying out the great work of supplying munitions of war, are doing their duty for their King and Country equally with those who have joined the Army for active service in the field."

The Master-General of the Ordnance also replied, suggesting that a ticket should be issued to each employee, " indicating that he is engaged in the manufacture of munitions of war and

[1] L.E. Department, C.O. Circular 1601.

that therefore he is unable to serve his country in any other manner."

In December the Admiralty circulated to firms on their list of contractors samples of badges, which were to be restricted to employees whose services were absolutely indispensable for the execution of work on His Majesty's ships and armaments. The War Office had not gone further than instituting a list of firms whose men were not to be accepted for enlistment without the written consent of a responsible member of the firm. Both Departments kept such lists; but, so far as warlike stores were concerned, the slight measure of protection they afforded extended only to the leading armament firms. It was natural that the War Office, bent upon its task of finding men for the new armies, should in this matter lag behind the Admiralty, whose principal concern was the enormous material requirements of the Fleet and of new construction. Up to December, 1914, neither Department showed any interest in the protection of industries other than those most directly concerned with the production of war material.

At the end of the year, however, the earliest attempts were made to take in hand the general problem of man-power. It is due to the War Office to record that the first move in this direction was made by the recruiting authorities. Two days after the Shell Conference of 21 December, Colonel Strachey of the Adjutant-General's department put forward proposals which recognise the need of considering recruitment in connection, not only with the protection of the armament firms, but with the claims of the whole range of industry.[1]

Colonel Strachey suggested that the help of the Board of Trade should be invoked in order to make such a classification of industries as might be the basis of instructions to recruiting officers. He pointed out that in certain industries (*e.g.*, war material, food, power and light, transport, public corporations' services) only a small proportion of men of recruitable age should be taken; others (*e.g.*, building and allied trades) should not be barred to recruiting on considerations of general prosperity. The question had arisen, how to decide what numbers could be taken from particular firms without injury to vital requirements. The great variety of local conditions made it impossible to deal with trades as wholes. The sound way would be to decide first what trades should be entirely, or almost entirely, barred; and as regards others, falling within the line of partial exemption, to consider each case on its merits.

The entirely, or almost entirely, barred trades were being dealt with by instructions to recruiting officers to enlist no man from armament or food-producing firms, etc., and a list of individual protected firms had been issued. The cases for partial exemption were scattered and various, and called for local knowledge. The responsibility for decision must rest with local recruiting officers; but, as the difficulties

[1] *Memorandum on Recruiting from Certain Industries* (23/12/14).

would increase, these officers would need some general guidance. This might be given in a table under three heads :—

(*a*) Industries, etc., barred, except with special permission.

(*b*) Occupations, etc., whose services to the country were such that the numbers taken must be limited.

(*c*) All other occupations, etc., to be recruited from freely.

The help of the Board of Trade would be needed to enumerate occupations under (*b*). They might also be able to suggest local officials who could assist the recruiting officers.

This memorandum reached the Board of Trade on 28 December, and led to a conference on 31 December, at which representatives of the Board met Sir Reginald Brade and Colonel Strachey. It was agreed, as a provisional arrangement, that employers' applications for the exemption of their men from recruiting should be referred by the War Office to the Board of Trade for consideration under two points of view : (1) the national importance of the industry concerned ; (2) the scarcity of labour for that industry and the possibility of replacing it. As will presently appear, this scheme of co-operation was held up by the War Office.

At the same moment the whole question was taken up by the Committee of Imperial Defence. On 1 January, 1915, Mr. A. J. Balfour wrote for this Committee a *Note on the Limits of Enlistment.*[1]

Mr. Balfour said that the very success of Lord Kitchener's appeal for men raised the question whether there was " any limit beyond which, *in the interests of the country as a fighting power*, enlistment ought not to be carried." What he had to say referred solely to fighting efficiency, not to private interests, however legitimate, or to the general convenience of the public.

Certain limitations were obvious and unquestioned. Not a man could be spared from the production of war material (in the widest sense of the term), which was required in excess of any powers of output possessed by the Allies. No man really required for the railways, mercantile marine, or collieries, or for the Civil Service, could be spared. In other words, in order that as a nation we might fight well, there were many citizens physically fit to fight, who must not be allowed to fight. Were there other classes to which these remarks applied ?

For convenience' sake he would omit, in the first instance, all reference to anything beyond our immediate material requirements, for example, public order and national credit. We *must* import food, raw material, probably gold, and probably munitions of war. We *must*, therefore, although a creditor country, make immense foreign payments, which could only be done either by borrowing abroad, or selling securities, or exporting goods. Of these expedients, borrowing was undesirable and perhaps impracticable ; to sell securities was undesirable. Only the export of goods deserved consideration. It followed

[1] Copy in HIST. REC./R/180/2.

that any enlistment which crippled industries either producing commodities for export or producing commodities at home (such as foodstuffs) which, if not made at home, must be imported, must diminish our fighting efficiency.

Accordingly, the general principles to be kept in mind were :—

(1) We could send to the Front, without national loss, every man of suitable age engaged in producing luxuries for home consumption. If, for example, every flower gardener, manservant, or gamekeeper were to join the Army, no loss of any kind would be inflicted on the community *as a fighting organism*. The same might be said of teachers, lawyers, writers, artists, of many employees of local authorities, and of all who were not engaged in any trade or profession.

(2) We could not send abroad, without further consideration, producers of luxuries for foreign consumption. It was necessary to consider whether the country would gain more by increase of its fighting numbers than it would lose by diminution of purchasing power.

These limitations were largely increased when moral or psychological elements were considered. Money was almost as necessary as men ; and most of the money must be borrowed. We should have to finance our Allies to some extent ; to pay our troops and their dependants ; and to buy arms and munitions in part for our Allies, as well as for ourselves. Also, those who were not, directly or indirectly, paid for fighting, must earn their living or be supported by the community. Our credit depended largely on two things : first, the maintenance of trade and commerce, and secondly, the healthy state of the country—the fighting spirit, and the absence of widespread distress and of any symptom of discouragement or disorder. To secure these conditions, recruiting must not be pressed too far. We should not find willing lenders if great sums of public money were being spent in relief of distress ; or if the War were bringing our economic machinery to a standstill ; or if discontent should become prevalent. We might go on fighting, but we should find it difficult to borrow.

It was assumed that the War would not be over in a few weeks. If an early peace were probable, national industry might be left to take care of itself. But, in the actual conditions, the Board of Trade should consider the situation, not from the point of view of national wealth, present or prospective, but from that of national production considered merely as an instrument of military success *in this War*.

The following Propositions suggested, not what could be done in practice, but what ought to be done in theory :—

1. No man should be encouraged to enlist whose labours are required to provide needful transports or fuel, or to produce armaments and equipment for us or our Allies.

2. Enlistment should not be allowed to hamper those industries which produce necessaries for home consumption.

3. Nor should it be allowed to hamper those industries which produce either luxuries or necessaries for foreign consumption, *so far as these are required to pay for our necessary imports*.

4. Every fit man, on the other hand, should be encouraged to enlist who is engaged either in producing nothing at all, or in producing luxuries for home consumption. But this proposition must be taken with a proviso. In cases where the enlistment of the physically qualified would throw out of employment a large number of those, who, by reason of sex or age, cannot serve in the Army, enlistment may conceivably be a source of weakness rather than strength. For it may diminish public confidence, and therefore also public credit, and thus destroy our powers of borrowing largely and cheaply. How many Army Corps would be required to compensate us for such a loss?

Having read Mr. Balfour's *Note*, Sir H. Llewellyn Smith addressed a memorandum to the President of the Board of Trade.[1] After mentioning the interim arrangements made for advising the War Office on employers' applications for the exemption of their employees, he stated that, at the request of the War Office, the Department was then examining the possibility of classifying industries and occupations in such a way as to afford some guidance to recruiting officers. The task was difficult as soon as it went beyond a very few groups of industries, about which there could be no two opinions. It was hoped that the examination of individual cases referred by the War Office might lead to the formulation of some general principle.

It was possible that occupations might be grouped as :—

(*a*) Barred to recruiting till further notice ;

(*b*) Barred to recruiting except through, or after consultation with, a Labour Exchange ;

(*c*) Freely open to recruiting.

As regards (*b*) a large amount of recruiting had been done through the Labour Exchanges. If it were laid down that, in border-line industries, applicants for enlistment must be passed through the Exchanges, instructions to managers might be varied from time to time according to the state of the labour market and military needs. As regards (*c*), recruiting could be encouraged in particular industries, such as the building trade, by appeals to employers and Trade Unions ; and the Labour Exchanges might be used to bring applicants for employment to the notice of recruiting officers.

In settling a classification, the Board of Trade and the War Office could give any desired degree of weight to each of Mr. Balfour's general considerations, especially maintenance of exports. It was doubtful, indeed, whether that consideration alone should be a ground for putting

[1] Copy in HIST. REC./R/180/2.

an occupation in class (*a*), in view of the notorious difficulty of distinguishing between luxuries and necessaries, and of separating luxuries for home consumption from those intended for export. The consideration might, however, weigh in the decision of border cases between (*b*) and (*c*). Mr. Balfour's memorandum was of value as emphasising the need to keep in view, not only the direct supply of naval and military material, but also the maintenance of exports sufficient to enable us to import, and of trade activity sufficient to enable us to borrow.

Sir H. Llewellyn Smith's memorandum was followed by a *Statistical Supplement*, estimating the number of recruits available and the proportions that might, without seriously crippling industry, be drawn from various groups of trades, classified in two lists.[1] List A contained essential occupations, in which labour not already occupied on war work should not be recruited, but diverted to war work. Under this head, the unenlisted balance of men physically capable of military service was estimated at 952,000. List B contained occupations which might spare a certain proportion of the balance for the Army. The outside limit of numbers that could be recruited without seriously crippling industry was about 1,100,000, in addition to the 2,000,000 already with the Colours, though the withdrawal of so large a number would greatly hamper industry, since the margin of unemployment (whether in the form of short time or of total unemployment) among men physically fit for service in all industries did not exceed 100,000. If the same figures were taken for unemployment in non-industrial occupations, the probable number of recruits available without any curtailment of production would be 200,000. Thus the ideal additional enlistment figure would be between 200,000 and 1,100,000. Production could be considerably curtailed with little harm,[2] and, if occupations were judiciously selected both for propaganda and for exemption, the limit might be put not far below 1,000,000.

A small inter-departmental committee of the Board of Trade and the War Office Recruiting department was formed to give effect to these proposals. Instructions had already been given to suspend recruiting in the case of armament workers, railway employees and woollen workers. The object of the committee was to examine applications from employers for similar exemption on the ground that their industries were essential to the armament firms.

In the debate on Army Reinforcements in the House of Lords on 8 January, Lord Midleton[3] called attention to the high percentage of recruits drawn, in the first three months of the War, from the mainly

---

[1] The lists are given in Appendix III.

[2] With regard to curtailment of production and Mr. Balfour's argument against reducing exports too far, it was estimated that, having regard to our position as a creditor country, to the export of capital before the War, and to other considerations, exports might fall at least 50% without danger, and perhaps considerably further. The recorded decline since the beginning of the War was 45% (as compared with 1913) and for December alone 40%.

[3] *Parliamentary Debates* (1915), *H. of L.*, XVIII., 351.

industrial, as contrasted with the mainly agricultural, districts. He quoted the official figures supplied to the Parliamentary Recruiting Committee as follows :—

Enlistment of Men Recruited by all sources, 4 August, 1914, to 4 November, 1914.

	Number of recruits per 10,000 of the population.
Mainly Industrial Counties—	
S. District of Scotland	237
Warwickshire and Midland Counties	196
Lancashire, etc.	178
London and Home Counties	170
Yorkshire, Durham, Northumberland	150
Cheshire, part of Lancs., and neighbouring Welsh Counties	135
N. of Ireland	127
Nottinghamshire and Derbyshire	119
Mainly Agricultural Counties—	
North of Scotland	93
West of England	88
East of England	80
South and West of Ireland	32

Lord Lucas, replying on behalf of the Government, acknowledged the need of protecting industries essential to the production of war material. He said :—

> " We have at any rate under our system, though it may be uneven and may fall heavily on some districts and lightly on others, avoided the enormous dislocation of industry which has followed the mobilisation of large conscript armies in the belligerent countries. The information which has reached us with regard to that, where they have had to call up men because they fell into certain categories or were of a certain age, and so on, has gone to show that the effect on the various trades has been of the very worst kind ; and in certain cases we know that special measures have had to be taken to enable men who occupy leading and important positions in their industries to go back. The noble Viscount (Lord Midleton) says that certain industries have suffered more than others. For this purpose you can divide industries into only two classes :—(1) industries which are essential to the turning out of war material and (2) all other industries ; and I think you can only say that, while it is of the utmost importance to prevent industries which turn out war material from being in any way crippled by recruiting, with regard to other industries, always speaking within limits, the first duty of any man is, if possible, to serve his country, and the second to continue his industry."

Mr. Balfour's *Note* and Sir H. Llewellyn Smith's Memorandum were considered by the Committee of Imperial Defence on 27 January, but no decision was reached. Lord Kitchener feared that the demands

of labour in satisfaction of Mr. Balfour's propositions or of others like them might, directly or indirectly, prejudice recruiting more than seemed likely at first sight. He objected to any system which entailed the rejection of any willing recruit. Instead of approving any scheme for protecting industry from enlistment, the Committee passed a Conclusion which aimed merely at replacing recruited men by ineligibles. The Conclusion was as follows :—

> " Employers of labour and trade unions should be appealed to to co-operate as far as possible, having regard to the special conditions of particular trades, to secure the employment of men ineligible through age or other reasons to become recruits, and of women in place of eligible men who may be taken as recruits."

In consequence of Lord Kitchener's attitude, the scheme of co-operation between the War Office and the Board of Trade was suspended. The Board of Trade still offered the help of the Labour Exchange organisation in any attempt to concentrate the active propaganda of recruiting agents upon unessential trades, leaving the others alone. It was, however, for the War Office to make a move.

Co-operation with the Board of Trade having thus been ruled out, the natural result was that during the next few months the matter was handled at the War Office, not as a broad question of the general distribution of man-power between military service and essential or unessential industries, but on the old principle, established by the Admiralty, of according the minimum of protection, by means of badges, to direct contractors for war material. At the end of 1914 it was no longer possible for the War Office to resist the emphatic representations of the great armament firms that they were losing men whose services they considered indispensable for the prompt execution of their orders. The principle of issuing official badges was adopted, and the work was organised in January and February by a new branch (M.G.O.L.) of the Master-General of the Ordnance's department, under Major-General Mahon.[1]

Under the scheme brought into operation in March, 1915, contractors were classified according to the importance and urgency of their work. Recognised armament firms holding contracts for warlike stores and certain manufacturers of explosives and aircraft were supplied with certificates for issue to all their employees, stating that the holder's services were urgently required, and with badges for technical workers whose services were " important for the manufacture of armament material for use in the field." The further steps taken in this direction after the appointment of the Armaments Output Committee at the end of March will be described later.[2]

In the first seven or eight months of the War, before the War Office scheme of badging was brought into working order, enthusiasm for enlistment had been at its height and the most vital industries had

[1] The formation of this Branch was announced in War Office Memorandum 801 of 5 April, 1915.

[2] See Part III, Chap. V., Section VII.

suffered losses which no subsequent efforts could altogether repair. When once a man had joined the Colours, no power could make him return to civil work against his will, and the influence of all his military superiors, from the General Officer to the platoon sergeant, was exerted to keep him in the Army, if he promised to make a useful soldier. Employers were constantly making attempts to reclaim valuable workmen ; but no arrangements for Release from the Colours were made till January, 1915. On the 13th of that month the Master-General of the Ordnance stated at a conference that engineering firms had been asked to supply lists of their men serving with the Colours ; but that no steps had yet been taken for their release. An Army Council letter was addressed, on 22 January, to the Commander-in-Chief of the British Army in the Field and to the General Officers Commanding-in-Chief, Commands at Home, directing the release of certain men. A further step was taken in March, when telegrams were sent to all the Commands in the United Kingdom, giving instructions that men of a few specified trades were to be picked out and sent to certain selected armament works. But no considerable numbers were actually released until the late summer.

The general result was that the activity of the recruiting officer during the first year of the War was subject to no effective check. Every outside influence was in his favour ; above all, the patriotism of the workman, who often could not be persuaded that his work was indirectly necessary to the equipment of the Army, and who, if he remained at his post, was insulted in the streets and taunted in the vulgar press as a coward. The need for a great increase of munitions production did not become known to the newspapers or to the public until long after it was appreciated by the Government, with the natural consequence that the Army filled its ranks with men who could never be replaced at the bench or in the shipyard.

III. The Board of Trade Programme for the Supply of Armament Labour and the Relaxation of Trade Union Restrictions, 30 December, 1914.

On 22 December, 1914, the large demands for additional labour made at the Shell Conference on the previous day were reported to the Cabinet Committee on Munitions. Instructions were immediately given by the President of the Board of Trade to Sir H. Llewellyn Smith to take the question in hand, in conjunction with Sir George Gibb and a representative of the Admiralty.

The Cabinet Committee suggested the following measures : (1) to co-ordinate the supply of labour ; (2) to substitute Belgians for British workmen ; (3) to divert labour from less urgent or unnecessary industries (*e.g.* railway construction works, etc.) ; (4) where employers in the less necessary trades were reluctant to part with their men, to put pressure upon them, first by persuasion, and then, if that failed, by refusal of railway facilities, etc., and by publicity for unpatriotic action ; (5) any other means for obtaining enough men for all the armament companies.

In pursuance of these instructions, on 30 December representatives of the Army Council and of the Board of Trade conferred with representatives of some of the chief armament firms and of the Royal Arsenal.[1] The meeting laid down the lines along which the efforts of the Board should be directed. The programme falls under three heads :

A. Fresh labour was to be provided from the following sources : (1) unemployed engineering workmen, to be supplied through the Labour Exchanges ; (2) Belgian refugees in this country (so far as these were suitable for armament work) ; (3) Belgian refugees in Holland, to be recruited by special agents sent by the Board of Trade.

B. An endeavour was to be made through the Labour Exchange organisation to induce engineering employers engaged on commercial contracts to spare some of their skilled workmen for employment at the armament firms' works.

C. Efforts were to be made to promote arrangements with the engineering Trade Unions whereby the existing supply of labour might be more economically and productively used.

The present chapter will deal with the measures taken by the Board of Trade under the first two heads of this programme, (A) for the drawing in of fresh labour, and (B) for the diversion of labour already employed from commercial to armament work. The former of these undertakings came properly within the functions of the Labour Exchange organisation and was pursued uninterruptedly throughout this preliminary period. The latter involved Government intervention in regions normally left open to the free play of bargaining between employer and employed, and soon encountered obstacles which could only be overcome by a series of measures establishing control over both parties.

IV. The Preference List of Royal Factories and Armament Firms.

It was decided by the Master-General of the Ordnance on 9 January that British skilled labour should be sent to the Royal Factories and the four armament firms on the following preference list :—

Royal Arsenal, Woolwich ;
Royal Small Arms Factory, Enfield ;
Royal Torpedo Factory, Greenock ;
Armstrong (Alexandria and Elswick) ;
Vickers (Crayford, Erith, Barrow, and Sheffield) ;
Coventry Ordnance Works ;
Birmingham Small Arms.

Belgians were to be sent only to the armament firms.

---

[1] Sir H. Llewellyn Smith, *Supply of Armament Labour, Preliminary Note* (23/1/15). HIST. REC./R/180/8.

Instructions[1] were issued, accordingly, that the circulation, through the Central Clearing House, of orders for engineering labour should be limited to these factories and firms and certain Admiralty contractors, who were to be added later. Employed workpeople whom their employers promised to release, were to be submitted only for vacancies at the firms and factories on the list.

On 8 April, in view of the urgent need for armament workers at Woolwich and Greenock, these factories were given the first refusal of all applicants, and four aircraft firms were added.[2] Other armament firms were included in the list from time to time.

V. The Supply of Fresh Labour for Armament Work.

(*a*) Unemployed British Skilled Workmen.

On 4 January the managers of Labour Exchanges were instructed[3] to bring the armament vacancies systematically to the notice of all suitable men signing an unemployed register or drawing benefit. If a man judged to be suitable declined to consider such a vacancy, his benefit was to be refused. The terms offered to unemployed men were identical with those offered to men whom their employers undertook to release from commercial employment.[4]

It was clear that the supply that could be drawn from the reserve of unemployed would not approach the figure of the total demand. A return of the numbers of unemployment books lodged on 18 December in the United Kingdom gave the following figures for the three groups of Trades specially concerned :—

Shipbuilding	4,011
Engineering	12,420
Construction of Vehicles	3,448

It was, however, believed that in Engineering the number of unemployed men was really far below the large figures given above. It was stated, for instance, that half the unemployed members of the Amalgamated Society of Engineers in this winter were in Canada.

There were several definite difficulties in the way of making available for armament work the reserve of labour apparently existing in the engineering trades. The men who were out of work at a moment when the demand was so keen were naturally the least skilled and efficient, whereas the armament firms generally asked for highly skilled labour. Some attempt was made to induce employers to take less skilled hands on trial ; but the campaign for what was later known as " Dilution " had yet to be begun, and the barrier of Trade Union rules to a large extent excluded the unskilled from the higher forms of work. Again, a large number were non-unionists, while many of the employers asked for union men and employed

[1] L.E. Department, C.O. Circ. 1719 (22/1/15).
[2] C.O. Circ. 1788 (8/4/15).
[3] C.O. Circ. 1700 (4/1/15).
[4] See below, p. 24.

hardly any others. This was another point of conflict with Trade Union rules. It was proposed that the Unions should be asked to withdraw their objection to working with non-unionists, on condition that all men should be paid the Trade Union rates and that men taken on after this arrangement was made should be the first to be affected by reductions of staff after the War. A third difficulty was that the men were, for the most part, scattered in small numbers all over the country. They would have to travel considerable distances to the armament works, and the majority, being married, could not easily move.

The effect of these difficulties and of the continued recruiting of skilled engineers for the Army was that, while the demands for labour rapidly rose, the supply gradually decreased during the first three months of 1915. The result of the first fortnight of the Board of Trade's campaign was that 1,493 unemployed British skilled engineers were submitted through the Labour Exchanges to the armament firms and Royal Factories; the yield of the next three weeks (to 13 February) was only 1,178; and a month later (13 March) the total result of the special measures taken at the beginning of the year was that 4,003 British skilled workmen had been submitted—a figure which included a small proportion of men diverted from commercial work—and of these only some 2,000 were known to have been actually engaged and to have started work. The weekly figures, moreover, were steadily falling. It was now evident that, even if the demand had remained stationary, it could not be met from the reserve of unemployed, and that it would be necessary to take some drastic action in the direction of compelling employers to release men engaged on private work.[1]

(*b*) Belgian Refugees.

As early as September, 1914, the Labour Exchanges were dealing with applications for Belgian and other refugee labour.[2] On 10 November a notice was issued in the Press stating that the Local Government Board and the Board of Trade had decided to act on a resolution transmitted to them by the Departmental Committee on Belgian Refugees, to the effect that it was desirable that Belgian labour should be engaged only through the Labour Exchanges, since these organisations alone were in a position to give priority to suitable British labour. Admiralty and War Office contractors were instructed to abide by this rule. Arrangements were accordingly made for lists of vacancies and applications for refugee labour to pass through the Labour Exchange organisation, and for obtaining a live register of Belgians. Two Belgian officials were employed in investigating the *bona fides* of any Belgians whom it might be desired to employ in Government contractors' works, or who were already so engaged. Rules of procedure for dealing with applications and

---

[1] See Sir H. Llewellyn Smith, *Supply of Armament Labour* (15/3/15). HIST. REC./R/180/8.

[2] L.E. Department, C.O. Circulars, 1620, 1649, 1658, 1665, 1686.

placings were issued to Labour Exchange managers on 15 December; and on 28 January they were instructed to secure a register of employable Belgian men and women, with a view to placing those who were either not of military age or exempt from service. The wages and conditions of employment were to be as good as those offered to British labour, and British labour was not to be displaced.[1]

On 4 January the Board of Trade also sent special agents to recruit Belgian refugees in Holland.[2] Up to 11 February, 1915, 434 armament workers were registered at the London Camp Exchanges as having been forwarded by these agents. About the end of January, it was decided that the work of the Board of Trade in Holland should be supplemented by agents of private firms selected by the Admiralty and the War Office. Letters were issued on 5 February to the firms concerned, stating the conditions laid down by the Board.

In spite of these efforts, however, the weekly figures indicated that this source of recruitment also was steadily drying up.[3] The numbers of Belgian workmen known to have been engaged through the Labour Exchanges and to have started work in the weeks ending at the undermentioned dates were as follows:—

January 9	525
,, 16	466
,, 23	477
,, 30	229
February 6	231
,, 13	386
,, 20	394
,, 27	203
March 6	235
,, 13	136

By 17 April the total number engaged was estimated at 4,094.

(c) Unskilled and Female Labour.

The figures so far given refer only to skilled male labour in the engineering trades, supplied in pursuance of the special arrangements initiated by the Board of Trade in January, 1915. They do not include the men and women supplied direct by local Exchanges. When these are added, the total number of workpeople of all classes supplied for armament work in the first ten weeks of 1915 amounts to 12,000, as compared with 18,000 in the previous five months.

The demand for female labour was, at the end of 1914, rather a prospective than a present one. Women would be needed to staff factories which were to be in working order in two or three months' time or later. The total prospective demand was then estimated roughly at from 10,000 to 15,000.[4]

---

[1] L.E. Department, C.O. Circulars, 1690, 1694, 1726.
[2] L.E. 1965/3.
[3] Sir H. Ll. Smith, *Supply of Armament Labour* (15/3/15). Hist. Rec. R/180/8.
[4] L.E. 48688.

The Board of Trade returns for December, 1914, showed the total contraction of women's employment as 34,000. The great bulk of this (30,000) occurred in the Lancashire Cotton Trade and ancillary occupations. It was considered that some of this free labour could be attracted into armament work if a wage of 20s. a week, together with the other terms allowed to men brought from a distance, were offered to women who had to leave their homes, and special care were taken in providing housing accommodation.

From the outbreak of war to 15 March, 1915, not less than 2,000 women were supplied for armament work, especially at Elswick and Alexandria. But in December, 1914, it was already clear that, since the great mass of unemployed women skilled in machine-minding were clustered in the Lancashire Textile area, female labour could be used with much greater ease and economy if new armament factories could be placed, not (as was proposed) in such centres as Coventry or Newcastle, but in existing buildings adapted for the new purpose in one or another of the Lancashire towns. This consideration was one of those which pointed to the alternative policy of spreading armament contracts over centres of industry hitherto devoted to peaceful trades.

The first systematic attempt to enrol women to replace male labour was made by the Board of Trade, which issued on 16 March, 1915, a notice to the Press and a poster inviting women prepared to undertake employment of any kind, with or without previous training, to register at the Labour Exchanges[1]. With regard to wages for substituted women, the general principle which Government contractors were required to observe was that for piece-work the same rate should be paid as to men.

The following table[2] shows the number of women enrolled by 15 May on the Special War Register for Women for work connected with munitions :—

Class of work desired.	Number registered.	With previous experience in their own trades.	Placed.
Armament Work	13,780	269	34
Engineering	450	360	0
Construction of Vehicles	13	60	0
Miscellaneous Metal Trades	389	1,265	26

The total number of women enrolled by June 4 for all classes of work was 78,946, of whom 1,816 had been engaged. The smallness of the second figure was officially explained[3] as partly due to the fact that in filling vacancies the supply of suitable labour on the ordinary

[1] L.E. Department, C.O. Circ. 1766.
[2] Intelligence Section Report, 20/5/15.
[3] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 347.

Labour Exchange register was first exhausted before the resources of the War Service Register were drawn upon. But it is probable that the 13,000 would-be armament workers with no previous experience included a large proportion of persons whom no employer would have thought it worth his while to train. It must also be remembered that the numerous obstacles which Trade Union customs and rules presented to "Dilution" had still to be overcome.

(*d*) Shipyard Labour.

With respect to the shortage of shipyard labour, steps were taken as the result of a conference held on 14 January at the Board of Trade with representatives of the Admiralty and of the principal shipbuilding contractors, and a joint conference with the Admiralty and the War Office. The December returns had shown the total demand for all classes of labour at the Government Dockyards and for shipbuilding firms employed on Government work as about 8,000.[1] Although on the same date there was, at various places in Yorkshire, a reserve of about 4,000 shipyard hands working short time or not engaged on Government work, discussion at the conference revealed that there was little chance of the shipbuilders' requirements being satisfied. There was very little unemployment, except in ship-repairing, a trade in which employment is casual and highly paid, involving therefore a considerable loss to the workmen transferred to regular shipyard work. Objection was taken to the employment of Belgians, on the ground that few Belgians were trained for this class of work. The shipbuilders accordingly had to look for fresh supplies mainly to the diversion of labour from private work; and, as this prospect was not very hopeful, their attention was rather focussed on increasing output by securing the relaxation of Trade Union rules.

(*e*) Importation of Colonial Labour.

As soon as it became clear that all the above-mentioned expedients for securing fresh labour were not likely to meet the demand, proposals for importing colonial and foreign labour were taken into consideration.

On 13 December, 1914, Mr. A. C. Johnson, of Alberta, Canada, had written to the Chancellor of the Exchequer a letter in which he stated that there were in Canada some 100,000 unemployed, of whom at least a considerable portion were ex-employees of Woolwich Arsenal, Government Dockyards, or armament firms. From among these the Canadian contingents for the new armies had been largely recruited. Mr. Johnson said that thousands more would willingly come to England to form an industrial reserve, as they had been hard hit by the collapse of industry. The terms suggested were: passage money, and a guarantee of steady work at a rate duly proportioned to the high rates prevalent in Canada. Mr. Johnson thought that

---

[1] L.E. 48688.

such a plan would be enthusiastically received even as far west as Alberta. This letter was forwarded by Mr. Hanson to the Board of Trade on 14 January, 1915.

The Master-General of the Ordnance' Committee on Armaments at its second meeting on 8 January, considered proposals both for sending skilled men to Canada to increase the munitions output there and for importing men from Canada to be trained by the Ordnance Factories or the armament firms in England. The latter proposal was negatived in view of the large orders already placed in Canada by the War Office.

It was revived by Sir H. Llewellyn Smith at a conference with representatives of the Admiralty and the War Office on 12 February. The Board of Trade then had reason to believe that there was considerable unemployment in Canada, and suggested that an agent might be sent to investigate the situation. The Admiralty and War Office representatives were not unfavourable, provided that due steps should be taken to see that only men of the right type were brought over.[1]

A cable[2] was accordingly addressed on 20 February to the Dominion Government, inquiring whether suitable men were available, and stating that passages could probably be paid both ways and that wages would be at standard rates with abundant overtime. A reply came on 23 February to the effect that a considerable number of suitable men could be found, and the despatch confirming the cable stated that there were " probably some hundreds of machinists at present (3 March) unemployed in Canada, the unemployment being found chiefly in the Western portions of the Dominion."

As soon as this confirmation had been received, the interested parties in this country were asked to state the numbers of men they would require and the conditions of employment. It then appeared that neither Woolwich Arsenal and the Government Dockyards nor private firms who were consulted (notably Messrs. Armstrong and Messrs. Vickers) favoured the proposal. The grounds of opposition were : (1) that the introduction of this labour would be likely to cause trouble with their employees ; (2) the difficulty of securing suitable men, since the best would probably have gone to the United States ; (3) a preference for placing further orders in Canada instead of withdrawing labour. For the moment, accordingly, no further steps were taken.

On 9 April the Chief Industrial Commissioner reported[3] that he had had conversations on the subject with Sir George Gibb and several employers, and that all united in thinking that, with the improvement in work likely to ensue from recent agreements, the uncertain value of the Canadian labour, and the large orders for the

---

[1] M.C. 201. [2] Copy in L.E. 1965/92. [3] M.C. 201.

Allies lately placed in Canada, a mission to collect labour there would not be advisable at the present time.[1]

The question of importing Colonial labour came before the Munitions of War Committee[2] on 26 April. Before the meeting, the Secretary prepared a memorandum[3] in which, after reviewing the abortive proposals for the importation of Canadian labour which have been described above, he said that the question had recently been revived by a number of communications from both employers and men in Canada, recommending importation to relieve unemployment in Canada, and to increase output in this country. Taken together, these communications, which came from Vancouver, Winnipeg, Hamilton and Toronto, afforded evidence of unemployment sufficient to call for investigation; and the Dominion Government were pressing for some answer from the Home Government. Messrs. Armstrong appeared now to favour the introduction of properly tested Canadian labour, and several prominent shipbuilders in the North were pressing for it. If the Committee should decide that labour trouble was not to be feared, and that substantial numbers of men were available, who might better be imported than employed locally, there might be a case for a detailed local inquiry.

The Committee decided that a mission should be sent to Canada, and the Board of Trade were instructed on 26 April to send representatives to make inquiries and, if a sufficient supply were found, to arrange for their transport, for the conditions of employment, and for testing the fitness of the men before they embarked. The mission was despatched early in May. It was under the charge of Mr. Windham (Board of Trade), and included Mr. G. N. Barnes, M.P., and technical officers from the Royal Arsenal and Dockyards. It was proposed to test the selected men in the workshops of the Grand Trunk and Canadian Pacific Railways.[4] The following were the conditions offered:—

(*a*) The standard British rate of wages, including war bonus, etc.;

(*b*) A guarantee of work to suitable men for a minimum of six months, for which time the men were to undertake to remain;

---

[1] Messrs. Vickers appear to have changed their minds on this question. The management at Barrow wrote on 10 May to the Head Office in London that they had already made arrangements with the A.S.E. to send through their agents in Canada a considerable number of workmen. Two consignments, of 16 and over 100 men, had been received, and a third of 52 men was then crossing.

[2] The "Treasury Committee," under the Chairmanship of Mr. Lloyd George, appointed at the beginning of April, 1915.

[3] M.C. 201

[4] The Canadian Pacific Railway refused facilities on the ground that the better policy would be to entrust more orders to Canada (Letter to Mr. Barnes, 31 May).

(*c*) Fares to be paid by the employer, and return fares to men who remained so long as they were needed for Government work during the war;

(*d*) £1 to be paid by the employer for incidental expenses[1];

(*e*) No families to be brought over.

In the first fortnight of July the Board of Trade imported 1,000 skilled men from Canada, and others were then on the way over. The field, however, was limited, owing to the number of Government contracts placed in Canada.

Proposals were also considered in April and May for bringing labour from the United States. A firm on the Clyde had tried the experiment of importing American labour and had succeeded in overcoming the initial difficulties. In April our Ambassador at Washington had reported numerous inquiries from American workmen who wished to come. The Munitions of War Committee, however, decided on 7 May that no action could be taken.

Offers of skilled men were received from New Zealand, Australia, and South Africa. The Committee at first resolved to accept these offers, but later came to the conclusion that the difficulties connected with transport, distance, and the testing of the applicants made it necessary to decline them.

VI. The Diversion of Labour from Commercial to Armament Work.

The activities of the Board of Trade in its campaign to increase the supply of armament labour, as above described, did not go beyond an unusual extension of the normal functions of the Labour Exchanges. The rest of the programme laid down in January involved Government intervention, to be justified (as was then considered) only by the emergency of war, in the field where hitherto the services, conditions, and rewards of labour had been the subject of free bargaining between employers and employed. In particular, the second head of the programme—the diversion of labour from commercial to Government work—meant an interference, on the one hand, with the freedom of the workman to take his services to the best market, and on the other, with the employer's freedom to undertake or to carry out whatever contracts might promise him the highest profit, without regard to the general needs of the Country.

The campaign in this direction had not been under way for a fortnight before it became evident that little progress could be made without compulsory powers. This part of the story is the preface to the whole series of measures by which the Government secured control over the operations of the employer and over the movement of labour.

---

[1] In July, however, it was arranged that the firms engaging Canadians would not be required to pay fares or subsistence.

THE TRANSFER OF LABOUR ON MOBILISATION. ALDERSHOT AND ADMIRALTY TERMS.

The Board of Trade scheme for diverting labour from private to armament work was, with some modifications, modelled on the procedure put in practice at the outbreak of war in connection with the mobilisation of the Expeditionary Force and the strengthening of the staff of the dockyards and shipyards engaged on Admiralty work. It will, therefore, be convenient to give here some account of these emergency arrangements. The terms, moreover, which were offered to the men transferred were used by Labour representatives as a lever in bargaining with private employers who sought to attract labour from a distance.

The mobilisation of the Expeditionary Force involved the instantaneous release of a relatively small number of men for short periods. A scheme known as the "Aldershot Scheme"[1] had been drawn up in March, 1914, and agreed upon between the G.O.C.-in-C. Aldershot Command and the Board of Trade Divisional Officer for the S.W. Division. When the scheme was approved by the War Office, the Managers of Labour Exchanges were informed that the rates offered for men transferred would be (according to the statement of the officer notifying the order) either the normal rates or the special "Aldershot terms," which were as follows :—

(1) Employers to receive 10s. a week for every man released for the duration of the emergency, provided that the man were re-employed at the end of that time.

(2) The workman to receive : (*a*) return fares, and, if he were not engaged on his arrival and were receiving no wages, a subsistence allowance till his return, on the basis of 5s. for 24 hours or less, and 2s. 6d. for every additional 12 hours or less ; (*b*) wages at the London rate for ordinary and overtime work ; (*c*) free food and lodging, or an allowance of 10s. a week ; and (*d*) a bonus, at the end of the emergency, if he stayed in War Office employment so long as he was wanted, at the rate of 50% of his entire wages for the first week, 20% for the second week, and 10% for each subsequent week.

Mobilisation being complete on 8 August, the special terms were withdrawn. A War Office letter[2] of 19 August stated that it had not been intended that labour should be taken on under the scheme for any other purpose than to expedite mobilisation, and that such labour should not be retained after this object was fulfilled.

It had been arranged with the Board of Trade in 1910 that the Admiralty should obtain through the Labour Exchanges all the additional skilled labour needed for the Dockyards, Victualling yards,

---

[1] L.E. 40540, L.E. 26387/7.
[2] 79/5027 (M). L.E. Department, C.O. Circ. 1603 (12/9/14).

and Naval Ordnance and Naval Stores Depôts, in times of war or other emergency. The final arrangements were approved by the Admiralty on 2 August, 1914.

The terms for emergency employment at the Dockyards were as follows :—

(*a*) Travelling expenses ; fares to be paid and, failing engagement, a subsistence allowance (as in the military scheme).

(*b*) Wages : the rates generally applicable in the Dockyards.

(*c*) Food and lodging to be free, or, in lieu of them, a subsistence allowance of 20s. a week, for 3 months at least, if the employment should last so long, and the man were not taken on the regular staff. This allowance was to be given only to men brought from other districts.

(*d*) Regular engagement or bonus. If the man were not taken on the staff at the end of the emergency, he was to receive a bonus, provided he stayed as long as he was required, at the rate of 10% of his entire wages for the first three months, and 5% for any subsequent period of emergency employment.

In the case of Admiralty work, the emergency of course did not cease with mobilisation, and consequently the Admiralty terms were not withdrawn. Though it had been originally intended that the subsistence allowance should be paid only for a short time, in fact it continued to be paid indefinitely. This practice naturally gave rise to a claim on the part of men whom private employers wished to transfer from a distance to their shipyards that they should receive the "Admiralty terms." As will be seen, this became the principal point of contention between the Shipbuilders and the Unions.

Men required for work in the military camps, and those transferred from private shipbuilding yards to yards engaged on Admiralty work were moved by the Labour Exchanges in the ordinary way with no special terms, except that, as a rule, railway fares were paid by the employers. Altogether, in the first fortnight of war, over 30,000 men were transferred by the Exchanges to urgent war work, principally in the dockyards and shipyards.

The Canvass of Employers in January, 1915.

The circular[1] issued by the Board of Trade on 4 January, 1915, contains instructions for the canvass of employers "not having Government contracts, who are likely to be able or willing to release men for armament work." Two lists were attached, one showing the classes of labour required, the other showing the firms in each Division who were working short time or reporting slackness of work on Form Z 8,

[1] C.O. Circ. 1700 (4/1/15).

and might therefore be expected to have men to spare.[1] The employers were to be asked on patriotic grounds to release, so far as possible, their best qualified workmen, since a high degree of skill was required. An undertaking was to be given that, if a man's services should be required by his present employer at the end of the War, the employer to whom he was transferred would release him. The terms offered to the men were as follows:—

(*a*) The standard rate of wages for the area in which the man was engaged;

(*b*) A guarantee of work for a minimum time of six months to suitable men;

(*c*) Free railway fares to the work, and return fares if the man were discharged by the employer as unsuitable within the guaranteed period of work.[2]

The schedule enclosed with the circular enjoined that, in the search for labour suitable for armament firms, every possible source, no matter how small, should be examined. Besides the general engineering and motor firms, many other classes of engineering concerns were suggested, including cycle manufacturers, textile engineers, electrical plant engineers, etc., and firms making objects from metal and using any of the machines for turning, boring, slotting, etc. Men of the high degree of skill required for armament work might be "looked for anywhere."

This circular was considered at the second meeting of the Master-General of the Ordnance' Committee on Armaments, held on 8 January. It was agreed that the Board of Trade should be asked to prepare a letter to engineering firms, pressing them to transfer men to other firms engaged on urgent war work.

This letter was issued about 15 January by the President of the Board of Trade, who, after referring to the urgent need for an immediate increase of production, continued:—

> "At the request of H.M. Government, steps are being taken by the Board of Trade to obtain the large numbers of additional

---

[1] Since the outbreak of the War a very large number of short time applications had been received at the Board of Trade under Section 96 of the Act, and rulings had been granted in a good many cases. Many of the firms were now working full time again, but reports from Divisional Officers showed as working short time: 5 general engineering firms employing about 2,000 men, 7 textile machinery manufacturers (about 1,500 men), 6 printing machinery makers in Yorkshire (about 1,000 men). (L.E. 48688.)

Firms chiefly employed on Government work and Railway Companies were reserved to be dealt with separately. Enquiries addressed to the chief Railway Companies soon showed that little could be expected from this source.

[2] These terms were suggested in a memorandum by Mr. Beveridge of 29/12/14 (L.E. 48688) with the following additional terms:—(*d*) a subsistence allowance of 5s. a day up to 3 days to be paid to the man, if not engaged, by the Labour Exchange and charged to the employer who had applied for the man; (*e*) a bonus of £3 or £2 to be paid by the employer to a man who left with his previous employer's written consent to take armament work through the Labour Exchange.

workmen required for this purpose. In doing this, the Board desire, as far as possible, to approach men now in employment only through and with the co-operation of their present employers, with a view to causing the minimum of disturbance to the course of ordinary industry. It is possible that some of the workmen now employed by you would be suited for this work and willing to take it. If this is so, I hope it may be possible for you to assist the Government by releasing these men for such employment.

"I realise of course that in view of your own requirements, the releasing of men may cause you difficulty or inconvenience, but I can only ask you, in view of the urgent national need, to give such help as you are reasonably able to give. Mr. Churchill and Lord Kitchener have intimated to me that they attach the greatest possible importance to the success of the efforts now being made by the Board of Trade. No greater service can be rendered at the present time by the employers of workmen qualified for such work as I have mentioned than by making men available for this work, or by the workmen themselves than by undertaking it."

By the middle of January preliminary reports received by the Board of Trade from several Divisions on the results of their canvass of employers had brought to light the obstacles which threatened to prevent any wholesale transference of labour from private work.[1]

(1) A strong and widespread demand was put forward by ordinary engineering firms that, instead of surrendering their men to the armament firms, they should be allowed themselves to tender directly for Government contracts. This was, in effect, to challenge the whole policy, then being pursued, of concentrating the flow of labour from the outside engineering trade upon the armament firms. The Board of Trade appreciated the economic advantages of bringing the work to places where labour could be found and existing premises and plant converted to the new purpose. They accordingly lost no time in setting about an examination of the possibilities of devolution and spreading of armament work. The history of the measures taken will be given later.[2] They prepared the ground for the activities of the Armaments Output Committee in April and May, and laid the foundation on which the whole structure of "Area Organisation" was afterwards to be reared.

(2) Some employers complained that their men were already being stolen from them by rivals who, in their anxiety to complete urgent contracts, attempted to abstract labour by advertisement or by canvassing agents empowered to offer higher wages, regardless of whether such labour was already employed on Government contracts or sub-

---

[1] See Sir H. Ll. Smith, *Supply of Armament Labour, Preliminary Note* (23/1/15). HIST. REC./R/180/8.

[2] Part III., Chap. I.

contracts. This grievance was ultimately remedied by the promulgation, on 29 April, 1915, of Regulation 8 B, under the Defence of the Realm Act.[1] The immediate effect of the complaints was to make it clear that any attempt to take men from private work, over their employers' heads, by advertisement or enticement, would incur the fierce hostility of the whole engineering industry outside the armament firms, and would render many firms unable to complete their contracts.

(3) Another objection frequently advanced by employers was that they could not, except under *force majeure*, set aside or postpone their existing contracts with their customers, in order to release their men for armament work. Several employers represented that they would welcome such compulsion. It is a point of some interest that this suggestion should have come from the employers' side, because in the sequel this limited proposal for Government control soon came to be linked with wider and vaguer schemes for the "taking over" of engineering concerns, including those exclusively engaged on armament work. It marks the beginning of that movement for the official direction of industry which finally led to the powers exercised by the Government over the "controlled establishment."

The Board of Trade was not slow to realise that some form of compulsion would be necessary, if labour was to be transferred in any but negligible numbers. Sir H. Llewellyn Smith, as early as 23 January, foreshadowed the provisions subsequently embodied in the Defence of the Realm (Amendment) No. 2 Act of March, 1915, which gave protection to employers prevented by Government interference from fulfilling their obligations.[2]

(4) Not the least of the difficulties encountered was that a much larger number of firms than had been anticipated were found to be doing, either directly or indirectly, Government work. This was the main ground of opposition reported, for instance, by the Divisional Officer of the West Midlands Division.[3] Before the end of January, his staff had visited 272 employers, of whom only 25 had promised to release men, while, out of the 75 men offered, no more than 28 had actually been secured. Even where Government work occupied only a substantial fraction of a firm's capacity, the margin could not be lopped off without dislocating the economy of the works and impairing the efficiency and output of what remained. The question how to make the best use of this immovable surplus of machinery and men was to become in the next few months the central problem of local organisation.

The upshot was that neither employers nor employed felt that sufficient inducement had been offered. It will be noted that no subsistence allowance, such as had been given to labour transferred on mobilisation, was included in the terms offered to the men. Without such a provision, it was difficult to persuade married men either to take

---

[1] See Part III., Chap. V. [2] See below, Chap. III.
[3] L.E. 1965/68.

work at a distance from their homes or to bear the expense of moving their families. The reason for the omission of any provision for subsistence allowances was that, at two conferences held on 13 and 14 January, the representatives of the War Office and of the Admiralty agreed with all the armament and shipping employers present in opposing the suggestion, when it was put forward by the Board of Trade. It was argued that such allowances caused trouble with the local workmen, and were used as a lever for raising wages.

VII. Results of the Board of Trade Campaign for the Supply of Labour.

The main results achieved by the Board of Trade campaign for supplying the armament firms with labour, whether unemployed or diverted from private work, may now be reviewed.

The following table[1] shows the results obtained up to 31 January :—

Firm and place of employment.	Belgians started work.	British workpeople submitted (including re-submissions).		British reported as having started work.
		Unemployed.	Released by employers.	
Armstrong, Alexandria ..	47	251	91	45
Elswick ..	—	601	116	265
Coventry Ordnance ..	118	113	26	27
Vickers, Crayford	1	233	58	11
Erith	306	110	62	33
Barrow	601	913	273	179
Sheffield	—	200	83	23
Manchester ..	3	—	—	—
Birmingham S.A.	8	128	128	4
Other armament firms ..	620	—	—	—
The Arsenal, Woolwich ..	—	273	85	34
Royal Factory, Enfield ..	—	90	38	5
Torpedo Factory, Greenock	—	342	82	12
Totals	1,704	3,253	942	638

A fortnight later the demands of the Royal Factories and the four armament firms on the preference list amounted to 9,103.[2]

[1] L.E. 1965/77. [2] L.E. 1965/8.

By the end of the first 10 weeks (up to March 15) some 4,000 skilled British workmen had been submitted to the Royal Factories and the armament firms, and about 2,000 of them had been actually engaged. To these must be added about 3,300 Belgians, making the total of men actually engaged 5,300, out of a total of 7,300 submitted. The balance of 2,000 submitted, but not engaged, included workmen who were rejected as unsuitable, or who refused the terms offered, or who changed their minds and stayed in their previous employment, or who were still awaiting definite engagement.[1]

A month later the supply was continuing, but at a much reduced rate. In the four weeks from 15 March to 10 April, another 1,000 skilled men were engaged, raising the total to 6,300. In addition, very large numbers of unskilled men, boys, and women were supplied. When the labour supplied to the shipbuilding trades is added to the above figures for armament workers, the total of men placed through the Labour Exchanges in the three months ending 16 April was 55,000, of whom 30,000, representing an average of nearly 400 a day, were in occupations reckoned as skilled. These, however, would not necessarily all be for Government work, since the Exchanges could of course only urge, not compel, men to take such work.[2] In any case the figures fell far below the demand.

It should be added, however, that, although the numbers of transfers declined for a time, by the first week of June they were mounting. During eight weeks in May and June the increase of men employed on war work in three Government works and private works belonging to six firms reached a total of 13,467.[3] This increase was probably due to the special efforts made by local munitions committees from April onwards.

On 10 June Mr. Runciman[4] stated in the House of Commons that in the preceding four months the Labour Exchanges had filled over 400,000 vacancies, of which more than 80,000 were in the engineering and shipbuilding trades, including 46,000 in skilled trades. Vacancies were now being filled at the rate of 4,000 a day.[5] Since the outbreak of war not less than 100,000 workpeople had been transferred through the Labour Exchanges to engagements on national work in other districts; and the total number of transfers from one district to another had been not less than 187,000.

In spite of these efforts, however, the demand continued to outstrip the supply. At the same date returns compiled by the Intelligence

---

[1] Sir H. Ll. Smith, *Supply of Armament Labour* (15/3/15). HIST. REC./R/180/8. The return of placings through the Central Clearing House for this period is given below in Appendix IV.

[2] Sir H. Ll. Smith, *Memorandum on Labour for Armaments* (9/6/15). HIST. REC./R/320/1.

[3] HIST. REC./R/200/10.

[4] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 428.

[5] The increases in the numbers employed in the Government Factories and 12 private armament works in the quarter ending 3 July are shown in Appendix V.

Section of the Ministry showed that the labour requirements at Woolwich, Enfield, and 16 firms doing munitions work amounted to 13,966 workpeople.[1]

Writing on 9 June, Sir H. Llewellyn Smith[2] observed that the acute shortage was practically confined to the skilled trades ; demands for unskilled men could be satisfied locally. The shortage was particularly marked in regard to certain types of workmen essential for setting up and equipping new factories and machines, men in the tool department, millwrights, etc. The ordinary economic control over the individual workman had broken down. "The question is whether some exceptional form of control or motive not of a purely economic character can be effectively substituted."

The answer to this question was the Munitions of War Act.

---

[1] M.W. 4591. A table given in Appendix VI., shows the demand at the National Clearing House on 1 July at a little over 14,000.

[2] *Memorandum on Labour for Armaments* (9/6/15). HIST. REC./R/320/1.

CHAPTER II.

THE RELAXATION OF TRADE UNION RESTRICTIONS, AUGUST, 1914, TO FEBRUARY, 1915.

I. Introductory.

Under the third and last head of the programme adopted on 30 December, 1914, the Board of Trade undertook to make "efforts to promote arrangements with the engineering Trade Unions, whereby the existing supply of labour might be more economically and productively used." These efforts were directed mainly to two objects: (*a*) the settlement of disputes, by means of some agreed procedure of arbitration, without stoppage of work by strike or lock-out; (*b*) the temporary suspension, for the duration of the War, of such Trade Union rules and practices as tended to restrict output, and, in particular, of those rules of Demarcation which parcel out the whole field of a highly organised industry into close compartments, dividing one class of skilled work from another, and excluding the semi-skilled or unskilled man or woman from the skilled man's job. The second of these objects was by far the more intricate and revolutionary of the two. The suspension of restrictive rules and customs was justly regarded by the workman as imperilling the most highly valued and hardly won safeguards of his standard of living. It meant the surrender of a system of defences built up, piece by piece, through the struggles of a century; and it entailed a sacrifice for which no compensation could be offered. It would be hard to name a more perilous field for even the most delicate advance of Government intervention.

The movement by which this question passed from the region of voluntary negotiation and agreement to the region of compulsory legislation falls into four stages:—

(1) During the first five months of war (August to December, 1914) it was debated at conferences of the normal type between the employers' Federations and the Unions. The discussions led to no agreement within that period, and tended rather to prejudice the chances of success in the following months.

(2) In January, 1915, the Board of Trade was invoked; and in February a Committee under the chairmanship of the Chief Industrial Commissioner reached a settlement of some minor points and formulated a programme for Government action.

(3) At the Treasury Conference in March, all the forces of the Government were brought into play. A direct appeal from the Cabinet

to all the Trade Unions connected, even remotely, with munitions production, resulted in a treaty, known as the Treasury Agreement, which, if it had proved effective, would have secured the suspension for the war period both of strikes and lock-outs and of restrictions upon output.

(4) Finally, when in the course of the next three months it had become clear that the Agreement was little more than a dead letter, negotiations between the Government and the Unions were re-opened, and the terms of the treaty were embodied in the first Munitions of War Act (2 July, 1915).

The present chapter will cover the first two stages only. Before the Treasury Conference can be discussed, it will be necessary to take account of a new factor—the proposed " taking over " of engineering establishments and the limitation of their profits—which emerged in February and March and had a decisive influence on the successful negotiation of the treaty.

II. Conferences of Shipbuilding and Engineering Employers and Workmen, August to December, 1914.

In response to an appeal issued by the Admiralty and the War Office in the first few days of war, joint meetings of employers and workmen were held to arrange what was called the Truce with Labour. Thus, on 4 August, representatives of the Clyde Shipbuilding and Engineering employers and employees " unanimously agreed to recommend to their respective constituents to assist in every possible way, as specially asked by the Admiralty and War Office, all firms employed on Government work urgently wanted during the present national crisis, in order to complete at the earliest possible date all such work." A resolution in similar terms, passed on 10 August by the Shipbuilding, Engineering, and Ship-repairing employers and workmen on the Tyne, explicitly included a recommendation " that all working restrictions be removed." Two clauses were added : " It is understood that the employers will endeavour to employ all men available, and arrange for night shifts where practicable in preference to excessive overtime. All existing machinery between employers and Trade Unions will continue, and be requisitioned when necessary."

The first step towards a suspension of strikes and lock-outs was taken on 25 August at a joint meeting of the Parliamentary Committee of the Trades Union Congress, the Management Committee of the General Federation of Trades Unions, and the Executive Committee of the Labour Party. The meeting resolved—

> " That an immediate effort be made to terminate all existing trade disputes, whether strikes or lock-outs, and whenever new points of difficulty arise during the war period, a serious attempt should be made by all concerned to reach an amicable settlement before resorting to a strike or lock-out."[1]

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 1572.

That this resolution represented the general feeling of the rank and file of trade unionists is sufficiently proved by the rapid decline in the numbers of strikes known to the Board of Trade during the first six months of war. In August the figure fell from about 100 to 20, in which some 9,000 workpeople were concerned. By the beginning of 1915 it had fallen to 10. The numbers of industrial male workpeople on strike were estimated in mid-July, 1914, at 72,000; in February, 1915, as "practically nil."[1] In February the curve began to rise again. These first six months were a time of peace in the labour world such as had never existed before and has not existed since.

(*a*) Shipbuilding Conferences.

Although the terms above quoted of the resolution passed at the North-East Coast meeting show that the shipbuilding trades shared the common apprehension of unemployment, very soon afterwards there was a marked shortage of shipbuilding labour on Tyne and Clyde and in the Barrow and Birkenhead districts. Efforts to find fresh skilled labour were unfruitful, and suggestions began to be put forward that demarcation rules should be relaxed so as to admit of one class of workmen supplementing another, and of the introduction of semi-skilled and unskilled workmen. On the Clyde, to obviate the scarcity of drillers, the Shipbuilders' and Engineers' Association made proposals to this effect in October. They were rejected by the Union to which the bulk of the drillers belonged. The Association then issued a letter stating that large numbers of workmen were still needed. The merchant shipbuilders had surrendered many of their hands to the warship-builders, and thousands had lately enlisted. Merchant shipbuilding was threatened with disorganisation and the closing of some of the yards. There was a special shortage of ironworkers, of drillers, and of apprentices. The Association urged that these vacancies should be filled at once, and emergency arrangements made for using other workmen, skilled and unskilled, in every suitable way. A joint meeting, to secure the co-operation of the Unions, was suggested. Though this letter referred only to the needs of merchant shipbuilders, the shortage was also felt at the Government Dockyards and by the Admiralty contractors. At this time, when the submarine was thought of chiefly, if not solely, as a danger to ships of war, the building and owning of the mercantile marine was not regarded as a national concern; and, since it was carried on for private profit, the employers were in a much weaker position, when it came to bargaining for the suspension of restrictions, than the contractors who could claim that their work was vitally necessary to the Fleet.

At the series of conferences which followed[2] it will be seen that the employers emphasised both the urgent need of obtaining more men

---

[1] *Board of Trade Supplementary Report on the State of Employment*, Feb., 1915, p. 9.

[2] Confidential Reports of the Conferences at York (3 November), Glasgow (9 and 16 November), Newcastle (19 November), and Carlisle (9 December), printed for the Ship-constructors and Shipwrights' Association, I.C. 71.

for Admiralty and for private work and the necessity of suspending Trade Union restrictions and particularly demarcation rules. The men, on their side, demanded for the transference of labour terms which the employers would not grant, and believed that the labour could be provided, if sufficiently attractive conditions were offered, without the sacrifice of Trade Union practices.

The proposed Conference " to consider the necessary steps for the acceleration of Government work due to the War " was held between the Shipbuilding Employers' Federation, the Standing Committee of Shipbuilding Trade Unions, and the Boilermakers' Society, at York on 3 November, 1914. The Union representatives suggested for consideration the following resolution :—

> " That the representatives of the various trades, having considered the position put before them by the Shipbuilding Employers' Federation, are willing to assist where possible to accelerate all Admiralty work in the present national crisis. In view, however, of the imperative necessity of the members in the various localities being consulted, the representatives suggest that, in those districts where urgent Admiralty work is being executed, the local representatives of the Unions and employers involved should meet with a view to agreeing on a method to accelerate such Admiralty work on an organised basis."

The employers objected that the resolution made no reference to merchant work. The opinion was expressed that that might follow.

The employers replied by handing in a resolution, in the form of a proposed joint finding, to the following effect :—

> That in view of the urgency of Admiralty work and the shortage of labour, due largely to the enlistment of nearly 13,000 workmen and apprentices, the representatives of employers and workmen, after full discussion, agree to the following special arrangements during the emergency :—(1) A general relaxation of Trade Union rules. (2) In view of the shortage of certain classes of men (especially drillers) occasioning the dislocation of the work of other trades and the suspension from time to time of other workmen, the employers shall be at liberty to add from any source such numbers of suitable workmen as may be needed. (3) In view of the shortage of apprentices (of whom one-third had joined the Colours and many would not return to their trades), all necessary steps should be taken and facilities given for filling such vacancies as soon as possible.

The Union representatives could not see their way to put such a proposal before their members. They undertook, as an alternative, first to attempt to find the men needed in any locality ; failing that, to relax their rules so that one class of workmen should supplement another ; and failing that again, to hold local meetings and consider the numbers required, there being still a certain amount of unemployment.

After this meeting local conferences were summoned at Glasgow and Newcastle.

At Glasgow the Clyde Shipbuilders' Association met the representatives of the shipbuilding trades on 9 November. The chairman stated that the Clyde firms needed 1,038 men at once, and fully double that number in the next three months. Difficulties were raised with regard to the wages of unskilled men, whom it was proposed to put on skilled work. It was also stated that some firms had refused to pay fares and subsistence allowances to transferred men.

After retiring, the Union representatives said they were prepared to assist in finding the men wanted for Admiralty work, and to that end put the following questions to the employers for the information of the various societies :—" (1) Will fares be paid to men coming from a distance ? (2) What lodging allowance will be paid to such men ? (3) How long will the job last ? "

An adjourned Conference was held at Glasgow on 16 November. The Admiralty had meanwhile been consulted about travelling allowances and had replied that, if they were paid, they must be paid by the firms, not by the Admiralty. The employers were not prepared to pay them. The Union representatives said that they could not pay the fares, and they required a guarantee of three months' employment. Local officials were not prepared to recommend their men to relax demarcation rules. They would do all they could to supply men locally.

At Newcastle the local conference between the Tyne Shipbuilders' Association and the representatives of the Shipyard Trades was held on 19 November. The questions as to travelling allowances and a guarantee of duration of work and of a minimum rate of pay were raised. The employers' chairman said that the employers could pay fares, provided the man stayed for three months. They would not pay subsistence allowances, or guarantee the duration of the job. The standard rate of the district would be paid ; but no minimum wage would be guaranteed.

On 3 December the Shipbuilding Employers' Federation addressed a letter to the Shipyard Trades stating that the results of the efforts of local Union officials to supply men had been disappointing. Very few additional workmen had been furnished. They invited the Unions to meet them in further conference at Carlisle on 9 December.

At this meeting the employers put forward the same terms for men transferred from other districts that had been offered at Newcastle. They further proposed that on warship work, electricians, joiners, and shipwrights should be allowed to drill any holes required for their own work, and that demarcation between joiners and shipwrights should be suspended. They were willing to discuss with the shipwrights piecework, premium bonus systems, or other measures for expediting work. They intended to appeal to the War Office to get men released from the Colours.

After this conference negotiations by correspondence were carried on with the Boilermakers on the subject of broken squads,[1] and with

[1] Riveters in shipyards work in squads, which are so constituted that, if one member of the squad is absent, the rest cannot begin work. The squad is then described as " broken."

Mr. Wilkie on behalf of the other shipyard trades. With regard to broken squads the employers accepted some of the Boilermakers' proposals, but rejected others, thereby making the scheme, in the Society's opinion, unworkable. They also failed to agree about subsistence allowances and other terms to be offered to men brought from a distance. The correspondence dragged on till February without any agreement being reached.

In a letter addressed to Mr. Wilkie after the Conference, the Federation confirmed the employers' proposals to the other Shipyard Trades. Mr. Wilkie replied on 22 December, stating the men's objections. (1) They objected to the restrictions attached to the offer to pay railway fares. (2) Employers could not expect men to come from a distance and keep up two homes, unless a subsistence allowance, such as was paid by the Admiralty, were given. (3) If employment was to be for a considerable period, there should be no difficulty in guaranteeing the length of the job. Without such a guarantee it was much harder for the Unions to persuade men to leave one district for another. (4) Piece-work rates had been arranged in certain cases, but on warship work such rates could not cover all work, and there was therefore a large volume of work for which the prices must be left to arrangement between the men's representatives and the manager, as was now the custom. (5) The question of piece-work and premium bonus for shipwrights was left to each district. Some arrangement might be made by individual firms with the district representatives. (6) The shortage of drillers could better be met by drafting 10% or 15% from merchant work. (7) Suspension of demarcation rules must be dealt with locally.

On 22 January the Federation replied, adhering to their proposals and expressing regret that no progress had been made in two and a half months.

Meanwhile, the Admiralty authorities decided that the matter was so urgent as to call for their intervention. On 15 December Dr. Macnamara interviewed the Standing Committee of the Shipyard Trades at Newcastle. The Chairman of the Committee referred to the conferences at York and Carlisle. He believed that with proper organisation the men required could be obtained; but men would not now go to shipyard work unless the shipbuilders would offer a subsistence allowance. The Secretary of the Boilermakers' Society quoted the employers' proposals made at the Carlisle Conference, and said that the Admiralty and other employers had granted all the terms refused by the shipbuilders. He accused the shipbuilders of exploiting the crisis to do private work for which there was no urgency, while they asked the Unions to remove their restrictions.

Dr. Macnamara summed up the men's proposals as follows:— (1) The employers should state their absolute requirements precisely and offer reasonable inducements; if that were done, the Unions would try to find the men. (2) The employers might fairly be asked to turn over 10% or 15% of their men from private to Government work. (3) Fares and subsistence allowances should be paid to men brought from a distance. (4) Three months' employment should be guaranteed.

Later on the same day, Dr. Macnamara met the Newcastle Shipbuilders. The employers stated that the Unions could not supply the men. They also complained that the percentage of time lost had increased during the War. They suggested a reversion to the old practice under which the whole of shipwright work was done as piece-work, and pressed for the abolition of demarcation. One speaker said that the difficulties could largely be met by adopting piece-work, by riveters working full time, and by some relaxation of rules as to apprentices. The additional payments demanded by the men would only have the effect of drawing labour from one district to another, and the firms could not afford them. To divert labour from private work would involve breaches of contract. The shiprepairers complained that many of their men had been attracted away by the Admiralty terms.

It was evident that the negotiations had reached a deadlock, neither party being willing to give way. The Government decided that the mediation of the Board of Trade should be invoked, and Dr. Macnamara reported the results of his enquiries to the Secretary of the Board.

(*b*) Engineering Conferences.

At the same time, similar negotiations were going on with regard to the relaxation of restrictions in the Engineering trades. Two special conferences were held at Sheffield on 10 and 17 December between the Engineering Employers' Federation and the Amalgamated Society of Engineers and kindred organisations, to discuss the shortage of labour. After discussion, the employers tabled proposals : " That in consequence of the Unions' inability to supply the requisite amount of labour, they agree to remove certain trade restrictions, without prejudice, during the continuance of the War." The employers asked for :—(1) more freedom to employ semi-skilled and unskilled men ; (2) freedom to put turners and other machine men on two machines ; (3) removal of all overtime restrictions ; (4) removal of all demarcation restrictions. These concessions were to be for the duration of the War only, with adequate safeguards for the return to existing conditions.

The majority of the workmen's delegates appeared favourable, but feared they could not carry their members with them, if (as was likely) a hostile minority should start an agitation. Accordingly no decision was reached.

At the second meeting on 17 December the Unions' counter-proposals were put forward. These included the payment of subsistence allowances to transferred men. The employers rejected the proposals as inadequate. They offered to resume discussion, if the Unions would agree to remove the restrictions specified in the employers' scheme. The Unions declined these terms, but it was arranged that a further conference should be held at Sheffield on 13 January.

Meanwhile, in the last days of December, the parties to this controversy also came into touch with the Board of Trade.

III. The Intervention of the Board of Trade.

Sir H. Llewellyn Smith, writing on 23 January, described the relaxation of trade union restrictions as "the most difficult and delicate of all the matters with which the Board of Trade have undertaken to deal." He added that the situation had been prejudiced by injudicious action and fruitless conferences between employers and trade unions. "The men are full of suspicion as to the real motives of the employers and the ultimate result of any concessions that they may make."[1]

The correspondence between the two parties in the shipbuilding trade had, in fact, been marked by a tone of increasing exasperation; and labour troubles of a serious cast were already brewing on the Clyde. In the engineering trade the relations were not as yet so strained. Mr. Brownlie and Mr. Young, of the A.S.E. Executive, co-operated with Mr. Allan Smith, of the Engineering Employers' Federation, in seeking a solution. On the other hand, the Union leaders felt by no means sure of carrying the rank and file with them. The Labour world took alarm at proposals made in the House of Lords on 8 January that preparations should be made for the introduction of compulsory military service, if the voluntary system should fail. On that occasion the Lord Chancellor declared that compulsory service, though a bad thing in itself, was not foreign to the Constitution and might be resorted to as a last necessity.[2] The suppression of strikes in foreign countries by means of the mobilisation laws was not forgotten; and the hatred of conscription was doubled by the fear that it would be used as a lever for industrial compulsion. Something of this apprehension may be read between the lines of the following passage summarised from the editorial notes written by the General Secretary of the A.S.E. in the *Monthly Journal and Report* for January:

> In order to accelerate production every reasonable means must be adopted to make the best use of the skilled workmen available. If the employers and the Unions could not agree, the Government would probably intervene in the interests of the men at the Front and what the Government might consider to be the interests of the nation as a whole. This opened up a way for compulsory orders from the War Office and the Admiralty, which in turn might ultimately pave the way for compulsory legislation not favourable to the workers. The writer was not opposed to the principle of national control over all armament factories and shipyards, but he felt that such an economic change would be more for the workers' benefit if carried out under peace conditions. He hoped that some *via media* might be arranged with the employers, with guarantees to safeguard the trade. Nothing must be done that would lower their future standard of living. The first essential, however, to maintain this was complete victory

[1] *Supply of Armament Labour, Preliminary Note* (23/1/15). Hist. Rec./R/180/8.

[2] *Parliamentary Debates* (1915), *H. of L.*, XVIII., 378.

> for the Allies. Failing agreement with the employers, assurances must be obtained from the Government, if they should intervene, that innovations should be only temporary. Otherwise the outlook for peace in the industrial world, after the War, would be black indeed.

The tone of this passage suggests that the Executive recognised the necessity of relaxation, but felt no less keenly that any bargain they could make must be one-sided and might easily be denounced as a traitorous surrender.

The embarrassments which beset the overtures of official intervention were expressed by Mr. I. H. Mitchell, of the Industrial Commissioner's department, in a memorandum dated 29 December. He pointed out that a request for the general suspension of restrictions would be met by the question how Trade Union interests were to be safeguarded after the War. Mere assurances would be of little value. Opposition, perhaps of national extent, might be aroused, and conducted by the rank and file, who could not be interviewed and conciliated. He thought it inadvisable to offer inducements to the Unions to make concessions ; it would be better to leave them to formulate demands. On the other hand, negotiations with the Employers' Federation might raise other difficulties. An alternative would be to deal with individual firms ; to induce the A.S.E. to relax their restrictions in particular shops ; and gradually to extend the process to others. The Society would then not appear as making any universal concessions ; rather it would connive at these local arrangements. Whatever was done, differences must occur, which would have to be settled without a stoppage of work.

It was arranged that a deputation of the Executive Council of the A.S.E. should confer with Sir H. Llewellyn Smith on 29 December. At this meeting several important suggestions were considered.

(*a*) WORK TO WHICH RELAXATION SHOULD APPLY.

It was urged that restrictions could not be relaxed for Government work and retained for commercial work in the same establishment. If this principle were accepted, it was evidently necessary to draw the line between establishments, rather than between the two classes of work. It was proposed that relaxation should be applied to any establishment, as a whole, certified by the Board of Trade, on the employers' application, as one in which Government work (or a " substantial amount " of such work) was done. As a compensation to the Unions, a 10% increase of wages in such establishments was suggested.

The Board of Trade later pointed out that this scheme would leave to the employer the option of paying the increased wages for the advantage of having no restrictions, or going on as at present. No legal sanction existed to enforce the proposed settlement on employers. To announce it as compulsory would involve the risk of having a Government decree openly flouted. If it were left optional,

employers short of hands would probably adopt it, on pain of losing men to other firms who offered the higher wages. The ambiguous proposal for a 10% increase on wages would be best interpreted as a 10% increase, in relaxed shops, on ordinary district rates at any time. This would mark the connection of the increase with relaxation, and would lead to a simpler settlement after the War. The settlement might be perpetuated and other shops levelled up; or there might be a return to present conditions at a sacrifice of 10% on wages.

In the later negotiations this method of compensation by increase of wages was dropped; nor did it prove possible to discover any other. All that could be offered to the Unions was the undertaking to limit the employers' profits, and the best possible security for a return to existing conditions after the War. Only the latter of these two conditions was discussed on 29 December.

(*b*) The Employers' Guarantee of Restitution.

It was at this meeting that the first definite formula was put forward by Sir H. Llewellyn Smith for an undertaking binding the employer to restore after the War the practices which the Unions were asked to sacrifice. It ran as follows:—

> "Messrs. being unable to obtain sufficient skilled engineers and being, as a consequence, prevented from meeting the urgent needs of the Country during the present national emergency, hereby undertake that any departure from present practice which it may be necessary to resort to in such matters as the working of machines, overtime, greater utilisation of semi-skilled, unskilled, or other labour, shall only be for the period of the War or until such time as sufficient skilled mechanics can be obtained, whichever period is the shorter.
>
> "Any difference arising under this undertaking shall be referred to the Board of Trade for settlement."

As will be seen later, this formula was considerably expanded before it was embodied in the Treasury Agreement and transferred from that Agreement into the Munitions of War Act, 1915.

(*c*) Proposed direct Appeal by the Government to the Unions.

As early as 23 December, Mr. Brownlie and Mr. Young had suggested to Mr. Mitchell that, in lieu of further negotiations on the old lines between the Union and the employers, some member of the Government should address both parties in a joint conference and impress upon them that in the interests of the nation it was imperative that the fullest use should be made of the workpeople and the machines. The suggestion was considered on 29 December, and again pressed by Mr. Brownlie and Mr. Young at an interview with Mr. Mitchell on 31 December. They believed that to such an appeal the men would respond loyally; but they thought it better that employers and men should be approached jointly. Mr. Brownlie suggested that an address from Mr. Churchill would have a great effect.

This proposal, taken up later by the Chief Industrial Commissioner, bore fruit in the Treasury Conference of 17-19 March. It is a point of considerable interest, and not publicly known, that it came in the first instance from the side of the Trade Unions. It is probable that the Union leaders were prompted by a consciousness that their unaided influence would not carry the Societies with them. The sacrifice which was called for undoubtedly involved great risk of compromising the whole Trade Union position, and that in a manner which, so long as profits were not limited, meant a very large increase of private gain to the employers. In advocating it, the leaders preferred to confront their members as the ambassadors of higher powers; and they might justly feel that so great a sacrifice could only be demanded by those who could pronounce with authority that it must be made in the interest of the Country.

At the request of Mr. Brownlie and Mr. Young, this proposal was left in abeyance till a final attempt should have been made to reach a settlement at the Sheffield Conference already arranged for 13 January. Meanwhile Mr. Brownlie and Mr. Allan Smith waited on the War Office and procured the issue of the following letter :—

LETTER FROM THE WAR OFFICE TO THE AMALGAMATED SOCIETY OF ENGINEERS.

WAR OFFICE,
2 *January*, 1915.

Dear Sir,—

I am desired by the Secretary of State for War to inform you that, while he fully appreciates the efforts of both employers and workmen to maintain adequate supplies for the Army in the field, the present requirements are such as render it necessary that further and greater efforts should be made.

The Secretary of State is aware of the difficulty due to a shortage of various classes of the workpeople required, but he is of opinion that temporary arrangements could be made to overcome this shortage, and that a greater output than at present could be attained.

Lord Kitchener believes that the call of the present national emergency is fully appreciated by the representatives of both employers and workmen, and that they will make arrangements to meet the requirements of the crisis and to secure the safety of the nation. He does not desire even to suggest what steps should be taken, but he does express the hope that these important matters may have your immediate attention.

A letter in similar terms has been sent to the Chairman, the Engineering Employers' Federation.

Yours sincerely,
HAROLD BAKER.

The General Secretary,
The Amalgamated Society of Engineers.

A letter in similar terms was issued on the same day by the Admiralty.

The third Conference between the Engineering Employers' Federation and the Amalgamated Society of Engineers and kindred Unions was held at Sheffield on 13 January.

The Employers submitted proposals as follows :—

"*Supply of Workpeople.*

"The Admiralty and War Office having requested the Federation and the Unions to take steps to secure an increased output ;—

"It is mutually agreed :—

"1. The following arrangements shall have effect during the War, and shall in no way prejudice any of the parties on any of the points covered, and the parties shall, at the termination of the War, as the Federation and the Unions now undertake, revert to the conditions which existed in the respective shops on the outbreak of hostilities.

"2. The Unions agree :—

That they shall not press the following questions to an issue, but shall confine themselves to noting any such by way of protest for the purpose of safeguarding their interests—

(*a*) Manning of machines, including lathes and the number to be worked by one operator ;
(*b*) Manning of hand operations ;
(*c*) Demarcation of work between trades ;
(*d*) Employment of non-union labour ;
(*e*) Employment of female labour ;
(*f*) Limitation of overtime.

"3. The Employers agree :—

(*a*) The provisions of paragraph 2 hereof shall be subject to the continued inability of the Unions to supply suitable workpeople of the classes desired by the employers at district rates.
(*b*) That with regard to demarcation of work the employers shall, as far as they can, having regard to the urgency of the work and the trades available, observe the demarcation fixed by local agreement or in practice observed.
(*c*) That workpeople shall receive the rates of wages and work under the conditions recognised in the shop in question for the trade at which they are for the time engaged.
(*d*) That this agreement shall not warrant an employer making such arrangements in the shops as will effect a permanent restriction of employment of any trade in favour of semi-skilled men.

"4. The Unions further agree :—
To recommend Unions not here represented that they should also adopt the foregoing attitude with regard to demarcation questions."

The Unions' representatives sent the following reply :—

"*Supply of Workpeople.*

"The Unions represented have given careful consideration to the proposals made by the Engineering Employers' Federation. The Unions regard these proposals as calculated to hinder production by introducing factors inevitably leading to friction in the workshops of the country, and as unlikely to meet the situation as stated by the employers. The Unions are, therefore, unable to agree to the abrogation of their established trade rights embodied in these proposals, and again direct the attention of the Engineering Employers' Federation to the proposals and suggestions made by the Unions."

This reply was signed on behalf of the A.S.E., the Steam Engine Makers' Society, the Amalgamated Toolmakers' Society, the United Machine Workers' Association, and the Scientific Instrument Makers.

The Unions' counter-proposals were as follow :—

"(*a*) Firms not engaged in the manufacture of war goods to be given such work.

"(*b*) Firms that are at present working short time to transfer their workmen to firms engaged on Government work.

"(*c*) Joint representations to be made to the Government to pay subsistence allowance money to men working in places at a distance from their homes.

"(*d*) That the Government draft skilled engineers from Australasia, Canada, and South Africa.

"(*e*) In view of the fact that 10,000 skilled engineers have recently enlisted, thus reducing the supply of skilled labour, the Government should withdraw from military duties all those available for industrial purposes."

The Unions' representatives held that these measures would furnish sufficient labour without encroachment upon Trade Union customs. The employers, on the other hand, considered them inadequate, and no agreement was reached. The engineering trades were now in the same deadlock that the shipbuilding trades had come to in December.

After the failure of the Sheffield Conference, Mr. Allan Smith proposed that Lord Kitchener should be asked to make a personal appeal to the Unions to suspend their restrictions. The suggestion was forwarded by the Board of Trade to the War Office. Lord Kitchener, however, declined to intervene. He considered that the Board of Trade, as the Department to which the War Office had referred the question of labour supply for armament purposes, should communicate with the parties and seek a settlement. It was then decided (about 19 January) that the whole range of questions in dispute with the engineers and

with the shipwrights and boilermakers should be dealt with by the Chief Industrial Commissioner, Sir George Askwith. Sir H. Llewellyn Smith wrote on 23 January in his memorandum to the Cabinet Committee on Munitions: "I have considerable hope that by the exercise of patience and tact a successful result may yet be achieved. I am strongly of opinion that nothing but disaster would attend any attempt to rush the position by a frontal attack on Union policy, or by any Government action which would give the Unions the impression that the Government in this matter were acting as the mouthpiece of the employers."[1]

The Board of Trade was in fact disinclined to resort to the policy of a direct appeal from the Cabinet, until the chances of conciliation by means of departmental intervention should have been exhausted. The needs of the country were paramount; but it was unquestionable that, on the broad issue considered merely as a bargain between employers and employed, the employers had everything to gain, the workmen everything to lose. As such a bargain the matter had hitherto been treated; and the too sudden descent of even the most tactful god from the Cabinet machine must strike Labour as, on the face of it, no better than a reinforcement of the enemy's ranks.

IV. Appointment of the Committee on Production.

Sir G. Askwith began his enquiries by interviewing Major-General Mahon, Sir Frederick Donaldson, a representative of Sir James Marshall, Sir Frederick Black, and Mr. Allan Smith. Officers of his department were sent to make local investigations at Newcastle and Glasgow.

A memorandum sent by Major-General Mahon to Sir George Askwith on 28 January is of interest as expressing the point of view of the M.G.O. department. Major-General Mahon began by stating the figures for the shortage of deliveries of projectiles as compared with contractors' undertakings. The shortage was attributed partly to the inexperience of subcontractors; partly to lack of material and delay in obtaining material and machinery; partly to delay due to bad weather, in completing new shops. But it was also caused to some extent by shortage of labour and bad time-keeping.

In addition to the efforts already being made, the following suggestions were offered:—

(1) Unskilled and female labour could be brought in for the less skilled classes of work. Learners should be attached to every machine now at work. Private workshops might be closed compulsorily in order to set free their labour.

A good deal had been done towards spreading contracts, but not with much success. All armament work required close expert supervision and could be better done in large shops than in small ones. The labour should be brought to the work, not the work to the labour.

(2) Loss of time was partly due to overstrain. There should be a compulsory rest from, say, 1 p.m. on Saturday to Sunday morning.

[1] *Supply of Armament Labour, Preliminary Note* (23/1/15). Hist. Rec./R/180/8.

A " civil " service decoration might be offered for deserving workmen, to be given when the War was over.[1]

(3) Some form of compulsory training, not necessarily amounting to military service, might be useful to give the employer more power over men who were slack at their work. But the country was opposed to this. The hours of closing public-houses should be considered.

(4) Competition for labour between employers in the same district should be checked. Advertisement for men at a distance should be stopped.[2] No form of maintenance or separation allowance for imported workmen should be allowed.

After a week spent in collecting information, Sir George Askwith mapped out a programme of action.[3] He began by remarking that there was little chance of progress being made, if the employers and the Union leaders were allowed to continue their dilatory negotiations. The Union leaders were hindered from accepting the removal of restrictions partly by distrust of the employers, partly by the fear that their own members would repudiate them. The Shipbuilding Employers' Federation was still making strenuous efforts, prompted no doubt by a desire to avoid the whole matter being taken up by the Government ; but the essentials to useful negotiation were wanting—confidence, trust in each other, and good faith. In such matters organisation of either party was a hindrance, since the officials on both sides, though eager to help in the national emergency, were hampered by their regard for the safety of their associations, and by the delay and difficulty of talking over their local branches.

Two methods of settlement were suggested, the second only in case the first should fail :—

(1) The ideal settlement would be to induce both sides to accept an agreement, by which the employers would undertake—

> " That any departure from present practice now ruling in their shops which may be necessary shall only be for the period of the War, or until circumstances should admit of existing practice being resumed. Departures from present practice contemplated would cover the attendance on machines, overtime restriction, greater utilisation of semi-skilled, unskilled, or other labour. Any difference arising from this undertaking shall be referred to the Board of Trade for settlement."

Such an agreement would leave the employers free to settle with their own men ; and, since in most instances the departure from present practice would mean more money for the men, it might be assumed

---

[1] This suggestion was adopted at the War Office. The institution of the decoration was announced by Lord Kitchener in the House of Lords on 15 March, 1915.

[2] The measures taken for this purpose by a Defence of the Realm Regulation prohibiting Enticement will be described below, Part III., Chap. V.

[3] Memorandum on *Shortage of Labour : Shipbuilding and Engineering* (28/1/15). Hist. Rec./R/180/3.

that, if they were assured by their leaders that the Trade Union position was secured and that any departure was only temporary, the men directly concerned would not be averse from coming to an agreement with their foremen.

(2) The prospects of such an agreement being very doubtful, there remained in reserve a direct appeal to be made by representatives of the Government, who might put a prepared scheme before both parties; hear and, if they chose, adopt any amendment suggested by either side; and then give a decision, intimating that that decision must be taken as a final settlement, at least until the parties could come to a satisfactory arrangement among themselves. A schedule of definite terms, to be put before the two parties, was given in the memorandum. It enumerated in detail the restrictions which it was desired to suspend on Government work, and included the employers' undertaking to restore existing conditions. There was also a provision that "in view of the necessity to avoid stoppages of work, on any difference arising which fails to be settled by the parties, work should be continued and the matter in dispute referred to the Government." In the Shipbuilding trades habitual time-losers were to be reported to the Trade Unions, fined, and if necessary expelled; and men so expelled were not to be re-employed. The vexed question of subsistence allowances was to be dealt with by leaving it to the men employed at a distance from their homes to arrange conditions with their new employers.

In a "General Introduction" to this schedule it was suggested that the Government should recommend, as the most satisfactory arrangement, "a complete suspension of activity by both employers' and workmen's organisations," allowing individual employers to settle with their workmen the conditions under which departures from practice might be introduced in order to accelerate production, on the understanding that workmen would not be put in a worse position and that any increased responsibility they were asked to undertake would be recognised.

This second part of Sir George Askwith's programme was, in its main idea, carried out at the Treasury Conference in March, though on that occasion it was departed from in one important respect, namely, that only the Unions, not both parties jointly, were invited to be present.

Meanwhile, in the course of February, Sir George Askwith and his colleagues on the Committee on Production sought to effect an agreement on the lines of the first part.

On 4 February Sir George Askwith submitted the outlines of his programme to the President of the Board of Trade, who expressed his approbation. It was considered that, since the Admiralty and the War Office were vitally concerned, it would be preferable that the Chief Industrial Commissioner should be assisted at the conferences by representatives of those Departments. The Prime Minister accordingly appointed the Committee on Production in Engineering and Ship-

building Establishments, consisting of Sir George Askwith as chairman, Sir Francis Hopwood (Admiralty) and Sir George Gibb (War Office). The Secretary was Mr. H. J. Wilson. The appointment was announced to the Engineering and Shipbuilding employers and to the Trade Unions connected with those industries.

The terms of reference were as follows :—

> "To enquire and report forthwith, after consultation with the representatives of employers and workmen, as to the best steps to be taken to ensure that the productive power of the employees in engineering and shipbuilding establishments working for Government purposes shall be made fully available, so as to meet the needs of the nation in the present emergency."

The Committee received instructions that, failing agreement, they should report to the Government, adding, if they pleased, statements of what they thought would be a satisfactory arrangement. They accordingly drew up four Reports, dated (1) 16 February; (2) 20 February; (3) 4 March; and (4) 5 March.[1]

Invitations were at once issued for two conferences, one for Shipbuilding, the other for Engineering. To each of these the associations of the employers and of the workmen concerned were invited, and individual firms on the Admiralty and War Office Lists were also asked to send representatives. It will be convenient to take these conferences in connection with the several Reports issued by the Committee as a result of them.

V. First Interim Report on Loss of Time and Broken Squads.

The Committee dealt first with the Shipping Trades. The complaints of the employers were set forth in a memorandum sent by the Secretary of their Federation (Mr. Biggart) to Sir George Askwith on 26 January.

(1) The increase of labour supply for shipbuilding was being checked by Trade Union rules limiting the manning of machines to their own members in cases where unskilled labour could be used, and by the refusal of Union men to work with non-unionists.

(2) Increase of output on the part of men already employed was hindered by lost time, which was attributed to high wages and drink; by sectional strikes and stoppages for higher wages; by demarcation rules; by limitation of overtime; by opposition to piece-work and to the premium bonus system; and by objections to the employment of journeymen for certain operations.

A Conference was fixed for 9 February, to which the following were invited :—

Employers.	The Shipbuilding Employers' Federation.
	The principal shipbuilding firms.
Workmen.	The Boilermakers' Society.
	The Shipwrights' Association.

[1] The first two Reports were published at once. The Third Report was printed along with the first two in the Board of Trade *Labour Gazette* for March, 1915 (published 15 March). The fourth was never published.

Before the Conference met, a letter was received from the Employers' Federation objecting to meeting the Unions in presence of the Committee. The Conference was accordingly adjourned ; but the Committee met the representatives of the Unions at a later hour on 9 February. The adjourned Conference met two days later. The Employers' Federation stayed away ; but sent in a memorandum on the history of the previous conferences and negotiations.[1] Representatives of eleven firms, however, attended, and a joint meeting was held, followed by separate interviews with both sides.

The discussion centred round Lost Time and Broken Squads.

The question of travelling and subsistence allowances was also raised. The representatives of the Shipwrights' Association stated once more the case they had put forward in the earlier negotiations in 1914. They said that they would be in a better position to obtain labour, if the firms doing Admiralty work would give a definite assurance on the following points :—(1) railway fares to be paid to men from a distance ; (2) lodging or subsistence allowances for such men ; (3) some guarantee as to the length of the job.

They further suggested :—(*a*) that 10% of the men employed on merchant work should be drafted on to urgent Admiralty work ; (*b*) that shipwrights and drillers who had enlisted and were still in the country should be brought back to the yards.

Mr. Carter, of Cammell, Laird & Co., wrote to Sir G. Askwith on 12 February, suggesting the following scheme for lodging allowances, designed to secure that only those men would be paid who would be put to the inconvenience of leaving or moving their homes in the public interest :—(*a*) Lodging allowance at 17s. 6d. a week (the amount regularly paid by engineers and shipbuilders, and agreed between the engineering contractors and the Amalgamated Society of Engineers) to be paid to men leaving one district for another for urgent Admiralty work. The Tyne, Clyde and Mersey to be treated each as one district. (*b*) No allowance to be paid unless the man produced a ticket from the Labour Exchange in the district he was leaving. The Labour Exchange officials, before giving such a ticket, to ascertain that he left with his previous employer's consent and (in some cases) to be satisfied that the man was not wanted in his own district.

The Committee, however, did not see its way to a settlement of this question. The only point on which there was a prospect of immediate agreement was the question of the loss of time occasioned by Broken Squads. The Committee decided to present without further delay an *Interim Report* (16 February) confined to this subject.[2]

In this Report the Committee pointed out that the methods of dealing with Broken Squads, which varied in different yards, could be considerably improved. The parties directly concerned, being acquainted with local conditions, should be charged with the duty of making the first efforts ; but the matter was so urgent that the Government should intimate that it must be dealt with effectively

[1] HIST. REC./R/180/4. [2] HIST. REC./R/242. 3/1.

within ten days. Failing agreement within that time, they recommended that the Committee should forthwith be called in to settle finally any outstanding differences. The employers should report the results of the proposed new arrangement to the Committee, who would then be able to consider what further steps were necessary.

This ultimatum led to an agreement for the making-up of Broken Squads, concluded between the Shipbuilders' Federation and the Boilermakers' Society on 13 March. This particular problem was thus for a time settled; but on 3 May the Executive Committee of the Boilermakers' Society, acting on the advice of the National Labour Advisory Committee, reported to the Committee on Production that the agreed arrangement had failed through an alleged lack of co-operation on the part of the employers.

The more important and general questions of relaxation, in which the Engineers were equally concerned, remained outstanding.

VI. Second Interim Report.

The Second Report of the Committee dealt, in the first place, with the special question of the relaxation of certain restrictions with a view to increasing the output of shells and fuses. This was the subject of contemporary negotiations between the Engineering Employers and Unions which led to the Shells and Fuses Agreement of 5 March.[1] As the Engineers were specially concerned in this question, the conferences with their Societies may be taken here. The rest of the Report dealt with general questions. It provided for the reference of all trade disputes to arbitration without stoppage of work; and it proposed a formula for the employers' guarantee to workpeople that suspended trade practices should be restored at the end of the War.

The first Conference of the Committee with the Engineers was summoned for 10 February. The following bodies were invited:—

Employers.	The Engineering Employers' Federation.
	The principal engineering firms.
Workmen.	The Amalgamated Society of Engineers.
	The Steam Engine Makers' Society.
	The Amalgamated Toolmakers' Society.
	The United Machine Workers' Association.
	The Scientific Instrument Makers' Society.

Like the Shipbuilders, the Engineering Employers' Federation declined, as a body, to meet the Unions. They thought that their position had been sufficiently defined in the earlier negotiations, and that there was no prospect of an agreement being reached by joint discussion. They suggested that the Committee should interview the two parties separately. When the Conference met on 10 February, the representatives of the Federation withdrew, but individual employers remained and the enquiry was opened. The workmen handed

[1] See below, p. 51.

in their proposals, which the Committee discussed with them separately. The Committee also interviewed the employers and asked them to draw up a Memorandum.

This Memorandum[1] was a revised version of the proposals debated at the Sheffield Conference on 13 January. The most important addition was an express provision that the agreement should cover private work :—

> " 9. In order to secure the maximum output for national requirements, these proposals shall apply to the industry as a whole and not to Government work only, and shall apply to workpeople employed in the shops or on board ships or elsewhere away from the factory."

The Committee's *Second Interim Report* (20 February)[2] contained very important proposals. It may be summarised as follows :—

A. Production of Shells and Fuses.

In view of the pressing and continuously increasing need of shells and fuses, the Committee urged that restrictive rules and customs should be suspended during the period of the War, with proper safeguards and adjustments to protect the interests of the workpeople. Two methods of increasing output were suggested :

(1) Workmen at present confined their earnings, on the basis of the existing piece rates, to " time-and-half," or whatever the local standard might be, partly with the object of protecting piece rates. The Committee agreed that the present circumstances should not be used as a means to lower these rates ; but they could be protected by other means than restriction of earnings and output. The men could be asked to produce to their fullest capacity, if the following recommendation were adopted. The firms engaged in producing shells and fuses " should give an undertaking to the Committee on behalf of the Government to the effect that in fixing piece-work prices the earnings of men during the period of the War shall not be considered as a factor in the matter, and that no reduction in piece rates will be made, unless warranted by a change in the method of manufacture, *e.g.*, by the introduction of a new type of machine."

(2) The employment of female labour should be extended.

Any differences under these two heads that could not be settled by the parties should be referred as suggested in the recommendation under (B).

B. Avoidance of Stoppage of Work.

During the present crisis nothing could justify a resort to strikes and lock-outs which were likely to impair the productive power of establishments engaged on Government work and to diminish the output of ships, munitions, or other commodities required by the Government for war purposes. The Committee submitted for the con-

[1] Hist. Rec./R/180/30 [2] Hist. Rec./R/242. 3/1

sideration of the Government that the following recommendation to Government contractors and sub-contractors and to Trade Unions should be at once published, and their adhesion requested :—

"*Avoidance of Stoppage of Work for Government Purposes.*

"With a view to preventing loss of production caused by disputes between employers and workpeople, no stoppage of work by strike or lock-out should take place on work for Government purposes. In the event of differences arising which fail to be settled by the parties directly concerned, or by their representatives, or under any existing agreements, the matter shall be referred to an impartial tribunal nominated by His Majesty's Government for immediate investigation and report to the Government with a view to a settlement."

C. GUARANTEE TO WORKPEOPLE.

It was recommended that each contracting firm should give an undertaking, to be held on behalf of the Unions, in the following terms :—

"To H.M. Government—

"We hereby undertake that any departure during the War from the practice ruling in our workshops and shipyards prior to the War shall only be for the period of the War.

"No change in practice made during the War shall be allowed to prejudice the position of the workpeople in our employment or of their trade unions in regard to the resumption and maintenance after the War of any rules or customs existing prior to the War.

"In any readjustment of staff which may have to be effected after the War, priority of employment will be given to workmen in our employment at the beginning of the War who are serving with the colours or who are now in our employment."

"Name of Firm .....

"Date....."

Disputes which might arise under this head to be referred as suggested under (B).

On the recommendation contained in Section (B) of the Committee's Report the Government took immediate action. On 21 February a Notice was issued to the Press, headed : *Avoidance of Stoppages of Work on Contracts for His Majesty's Government.* This notice embodied the recommendation in Section (B) of the Report, prefaced by the reasons the Committee had given for it. The Government expressed their concurrence, and, with a view to providing the necessary tribunal, they extended the present reference to the Committee by empowering them "to accept and deal with any cases arising under the above recommendation."

This Notice was sent on 22 February to the War Office and the Admiralty, who were requested to issue it to their contractors with

an intimation that arrangements should be made for the procedure indicated for settling disputes. It was also communicated to the employers' associations and to the principal Trade Unions throughout the country.

Under the new extension of their terms of reference the Committee now undertook arbitration. This ultimately became their principal function, under the Treasury Agreement and the Munitions of War Act.

On 1 March Sir George Askwith sent copies of the *Second Report* to the War Office and the Admiralty for distribution to their contractors, with a letter calling attention to the Employers' Guarantee and requesting the contractors to give the undertaking recommended. The Admiralty at once took action accordingly. At the War Office the issue of similar notices was delayed by a misunderstanding which was not cleared up until 12 March.[1]

VII. The Shells and Fuses Agreement.

The negotiations which had been simultaneously carried on between the Engineering Employers' Federation and the A.S.E. and allied organisations led to a conference at Sheffield on 5 March, at which a memorandum known as the Shells and Fuses Agreement was accepted by both parties. The principal points may be summarised as follows[2] :—

1. The making of tools and gauges and the setting up of machines was to be done by skilled or competent men. Such men might be drawn from other branches of the industry, provided they should be qualified and receive at least the standard district rate, and should be the first to be affected by reductions of staff.

2. Semi-skilled or female labour might be substituted for skilled labour in suitable cases, provided that skilled employment in the same department were found for the men displaced, and that the substituted workpeople should be paid at the usual district rates, and be the first to be affected by reductions of staff.

3. The Employers' Federation undertook—

(*a*) That the temporary relaxation should not ultimately prejudice the workpeople or the Unions ;

(*b*) That pre-war working conditions should be reinstated at the end of the War, unless the Government should notify that the emergency continued ;

(*c*) That men serving in the Forces should so far as possible be re-employed ;

---

[1] The Treasury Memorandum of 19 March, as will appear later, contained a fuller form of Employers' Guarantee. The Committee on Production, after the issue of that Memorandum, decided that the formula contained in it should be substituted for the one given in their own Second Report. See below, Chapter IV., Section III., p. 95.

[2] The text of the Agreement is given in Appendix VII.

(*d*) That work should not be so re-adjusted as to restrict employment permanently to semi-skilled or female labour ;

(*e*) That the Agreement should not be used, after the War, to decrease wages, premium bonus times, or piece-work prices (unless warranted by new methods or means of manufacture), or to break down established conditions. The proposals were to be adopted only to increase output in the present extraordinary circumstances.

4. The employers agreed to do all they could to ensure distribution of Government work throughout the kingdom.

5. The employers agreed to reduce overtime where this was possible and consistent with national requirements, and, in any case, to distribute it as widely as practicable.

6. No employer was to take advantage of these proposals unless he intimated to the local representatives of the Union his acquiescence in all the provisions.

The result of the ballot taken among the Trade Union members early in April was favourable.

VIII. Third Interim Report. Demarcation and Utilisation of Semi-skilled or Unskilled Labour.

Meanwhile, the Committee on Production continued to deal with the question of restrictions. Further conferences on the subject of demarcation were held with the representatives of the Trade Unions concerned, including the Emergency Committee of the Federation of Engineering and Shipbuilding Trades and the Shipbuilding Joint Trades Standing Committee. The Committee also heard the employers' views on the matter.

At a Conference held on 15 February with the Shipping Trades Unions, to which the Amalgamated Society of Engineers were also invited to send a representative, the Chairman proposed the suspension of demarcation restrictions subject to the following safeguards :— (1) That the men usually employed on the work required should not be available ; (2) that urgency of execution should be essential ; (3) that difficulties arising from departure from practice, if not settled by the parties, should be referred to the Board of Trade, and that, pending such reference, there should be no stoppage ; (4) that the employers should give a guarantee that departure " shall only be for the period of the War or until circumstances (before the termination of the War) admit of existing practice being resumed."

After retiring to consider the proposal, the Trade Union representatives put certain points to which the Committee subsequently replied. (1) It was agreed that the present discussion was confined to the relaxation of demarcation rules in the skilled trades there represented. It did not, therefore, leave an opening for the introduction of semi-skilled labour. (2) The Unions wished it to be understood that the arrangement should apply only to Government work. The Committee

stated that they were aiming at separating Government from merchant work, but were not sure how far the distinction was practicable in certain yards. (3) The Committee accepted the principle that any substituted labour should be paid at least the ordinary rate of wages for the work. (4) It was agreed that disputes should be referred "within seven days." (5) The Unions proposed that, in the case of piece-work, where a departure from practice caused loss of wages to individual men, the wage should be made up to the average wage before the change. This proposal was recast by the Committee, who suggested that differences as to loss of wages due to departures from practice should be adjusted between the men's representatives and the employers, and, failing adjustment, should be referred, the principle being that, where possible, the average wages of the men should be taken into account. (6) Departures from practice were to be recorded by the Board of Trade. (7) The Unions believed that many skilled men would come from a distance, if travelling allowances on the lines of the Admiralty terms were offered. This the employers had refused. On this point the Committee would not make any definite statement.

The Chairman remarked that the Committee would be in existence to impress upon the Government the necessity of restoring the pre-war status. The intention was that there should be no prejudice after the emergency. The Union representatives undertook to report at once to their Society.

A few days later the Executive Council of the Amalgamated Society of Engineers at their quarterly meeting considered a report of the proceedings on 15 February, and "unanimously agreed to endorse the recommendation of the workmen's representatives to afford the Government every possible facility for the output of work intended for the naval and military forces during the present national crisis."

The Shipping Trades Unions, on the other hand, adhered to their old position. The Ship-constructors' and Shipwrights' Association wrote on 2 March to the Committee on Production. Their Executive Committee had decided that any departure from past custom, so far as the allocation of work was concerned, must be after consultation with the men involved. Without the men's cordial co-operation work would only be retarded, as had already happened. They urged that their suggestions, as made at the Conference, were the only practicable means of accelerating work. They undertook that where firms required skilled men of their trade, if the firm would apply to their district representatives, and fares and lodging allowances were given, they would endeavour to find the men. Failing that, then, in consultation with the firm and the men involved, the district representative would arrange, in accordance with the Committee on Production's suggestions, for the work to proceed.

The Shipbuilding Trades Standing Committee wrote to Sir G. Askwith that they had agreed to recommend to their affiliated societies the suggestion put before them by the Committee on Production. At the same time they reiterated the propositions laid down in the above letter of 2 March.

The *Third Interim Report* of the Committee (4 March)[1] may be summarised as follows :—

(*a*) DEMARCATION OF WORK.

The Committee recommended that demarcation restrictions should at once be suspended in Government establishments, where they were understood to be less numerous than in private yards and workshops. In private establishments they considered that " on work required for Government purposes or affecting the same, the demarcation restrictions which at present exist in regard to the work of the different skilled trades in the Engineering and Shipbuilding industries should be suspended during the continuance of the War," subject to certain safeguards :—(1) That the men usually employed on the work required were not available ; (2) that men might be brought from a distance, under certain conditions ; (3) that the relaxation should not lower the customary rates ; (4) that a record of the nature of the departures from the *status quo* should be kept ; (5) that differences which could not be settled between the parties should be referred to the Board of Trade within seven days, and meanwhile there should be no stoppage ; (6) that the guarantee to workpeople suggested in the Second Report should be adopted.[2]

(*b*) UTILISATION OF SEMI-SKILLED OR UNSKILLED LABOUR.

It was recommended that the employers should be allowed greater freedom to use unskilled or semi-skilled labour, subject to proper safeguards, which were held to be sufficiently provided for in the Employers' Guarantee.

Disputes which could not be amicably adjusted should be referred to the Committee.

The above Report was sent on 8 March to the Admiralty, to the Army Council, and to the Unions and the Employers. Before discussing the Report and, if possible, coming to an agreement upon it and upon methods of carrying it out, both parties waited till the Amalgamated Society of Engineers' ballot on the Shells and Fuses Agreement of 5 March should be complete.

IX. Results achieved by the Board of Trade and the Committee on Production.

By the end of February it was seen that Sir George Askwith was justified in his original forecast that the first of the two methods he had proposed would fail. The only tangible results achieved by conference and conciliation were :—The Boilermakers' Agreement for the making-up of Broken Squads ; the Engineers' Shells and Fuses Agreement ; the issue to War Office and Admiralty contractors of a request that they would give the Employers' Guarantee ; and the erection of the Committee on Production into an arbitration tribunal, to which the Government had given instructions (of no binding force) that

[1] HIST. REC./R/242. 3/1.

[2] It will be noted that these safeguards combine some of the Committee's original proposals put forward on 15 February with some of the workmen's proposals on the same occasion.

differences should be referred without stoppage of work. Valuable as these results were, they went but a little way towards effecting a really substantial increase of production. The wider proposals for a general relaxation of restrictive trade practices were not accepted by the Unions, but stood as mere recommendations in the Committee's Reports to the Government.

It was unfortunate that the Committee's efforts should have coincided with a sudden and marked outbreak of industrial unrest, which was caused in the month of February by the rise in the cost of food and of other necessaries. In a debate on this subject in the House of Commons on 11 and 17 February, several members asserted that exorbitant prices were being exacted, and that the food markets were rigged by speculators. Mr. Bonar Law made the first of his honest confessions that "well-managed ships to-day are making simply enormous profits, and that these profits come from the very cause for which the people of this country are making sacrifices in every direction and even giving their lives"[1]—a statement not calculated to allay the agitation then being conducted on the Clyde. Extravagant accusations of profiteering and cornering had been current in the Press since the last weeks of 1914. The sudden effect in February of the rise in prices outstripping any advance in wages, may be illustrated by the following figures of the numbers of disputes involving stoppage of work, known to the Board of Trade[2]:—

1 January, 1915	.. .. ..	10
February	.. ..	47 fresh disputes
March	.. ..	74 ,, ,,
April ..	.. ..	44 ,, ,,
May ..	.. ..	63 ,, ,,

If the situation was grave in February, it became more menacing during the next four months. Reviewing this period in June, 1915, Mr. I. H. Mitchell, of the Industrial Commissioner's Department, wrote :—

> "I am quite satisfied that the labour difficulty has been largely caused by the men being of opinion that, while they were being called upon to be patriotic and refrain from using the strong economic position they occupied, employers, merchants and traders were being allowed perfect freedom to exploit to the fullest the Nation's needs. This view was frankly submitted to me by the leaders of the Clyde Engineers' strike in February last. As soon as Labour realised that nothing was being done to curtail and prevent this exploitation by employers, it let loose the pent-up desire to make the most they could in the general scramble. This has grown until now many Unions are openly exploiting the needs of the Nation. If the work is Government work, it is the signal for a demand for more money. Trade Union leaders who, from August last year until February this year, loyally held their members back from making demands, are now with them in the rush to make the most of the opportunity."

[1] *Parliamentary Debates* (1915), *H. of C.*, LXIX., 793.
[2] *Ibid.*, LXXII., 1257.

Mr. Mitchell's statement points to the fundamental opposition which lay at the root of these troubles. On the employers' side was the demand for the wholesale removal of restrictions which tended to limit output. On the men's part, besides the doubt whether restrictions, once removed, could ever be restored, there arose about this time the counter-demand for some security that this sacrifice should benefit, not the employer, but the Nation—in a word, for limitation of profits, if not for complete Government control of production.

By the beginning of March two things had become evident. In the first place, the time had come to have recourse to the second of Sir George Askwith's methods—a direct appeal from the Government to the Unions. This appeal was made at the Treasury Conference of 17 March. In the second place, no further headway could be made until the Government should have taken some steps towards limiting employers' profits, and shown some intention of controlling the employer as well as the workman. The measures adopted to this end will be the subject of the next chapter.

CHAPTER III.

THE CONTROL OF INDUSTRY AND THE LIMITATION OF PROFITS.

I. Introductory.

In March, 1915, the Government embarked on two undertakings which, partly owing to the fact that they were pursued concurrently and partly because the ambiguous phrase, " taking over," was applied to both, were inextricably confused in the public mind. One was the passing of the Defence of the Realm (Amendment) No. 2 Act, which extended the power, already possessed by the Government, of taking possession of munitions works so as to include any factories or workshops whatsoever, and also gave them power to control the use of works and plant, of which they did not " take possession," with the object of increasing war production. The other was a scheme for securing some control over the principal armament and shipbuilding firms, analogous to the control exercised over the railways—a scheme which was soon narrowed down to the limitation of their profits, and was finally realised in the controlled establishment clauses of the Munitions of War Act, 1915. These two measures were alike in so far as they both aimed at establishing Government control over engineering concerns ; but there the resemblance ends. In origin, method, and purpose they differ widely.

The control exercised by the Government over the controlled establishment under the Munitions of War Act principally means : (1) that the profits are limited, and (2) that restrictive Trade Union practices are suspended, the employers giving a guarantee of restoration after the War. This has now become so familiar that it is, perhaps, forgotten that originally the idea of " taking over " factories (other than the regular armament works) for munitions production was not associated either with the relaxation of restrictions or with the limiting of employers' profits. This is true not only of the relevant section of the Defence of the Realm Consolidation Act, 1914, but also of the amendment of that section which was embodied in the Act of March, 1915. The history of this Act goes back to January of that year. At its inception the sole object in view was to facilitate the extinction of private work in favour of munitions production, either by converting fresh engineering factories to war purposes or by transferring the plant and labour from them to armament works. The Bill was prepared because it was found impossible, without compulsory powers, to divert engineering plant and (above all) labour from private to Government work. From beginning to end, there is not a word in it that even hints at limiting profits or removing restrictions on output.

The powers obtained under this Act were not required for the other scheme of " taking over " the armament firms ; the necessary powers already existed under the principal Act, though, as it turned out, they were not exercised. All that came of this second enterprise was some negotiations for limiting the profits of the chief contractors, which could not be carried through until the Munitions of War Act had been passed in July.

The confusion which arose between the two undertakings was increased by the circumstance that the amending Act was passed on the very eve of the day when the bargain between the Government and the Trade Unions, that restrictions should be sacrificed if profits were limited, took shape at the Treasury Conference ; and the powers which the new Act gave the Government to " take over " engineering works were then pointed to as providing the means of limiting profits. In the last weeks before the Bill was introduced on 9 March, the failure of conciliation to secure the removal of restrictions had become apparent. The rock in the path was the profits of the employer, who stood to gain all the pecuniary benefit accruing from the suspension of Trade Union rules. Hence the policy of " control " took a new orientation, directed towards limiting the profits of the chief War Office and Admiralty contractors, and negotiations were opened with Messrs. Armstrong and Messrs. Vickers, with the ulterior purpose of inducing the Trade Unions to ratify the bargain struck at the Treasury Conference. The accidental fact that, at the same moment, an Act was passed which, though totally different in scope and intention, dealt with the " taking over " of engineering works, undoubtedly influenced the Unions to give their consent and created confusion in the minds, not only of the Unions, but of Members of Parliament and of the general public.

II. The Defence of the Realm (Amendment) No. 2 Act, 1915.

Origin of the Bill.

The Board of Trade campaign for the diversion of suitable labour from commercial to Government work had been blocked in the first weeks of 1915 by several obstacles, which have been described in an earlier chapter.[1] These proved so serious that Sir H. Llewellyn Smith wrote on 23 January : " It is feared that not much more can be expected under this head."[2] In face of this immobility of labour, the course favoured by the Board of Trade was to take the work to the labour and plant by spreading munitions contracts as widely as possible over the whole engineering industry ; and measures were at once taken to explore these possibilities. It was, however, clear that this process, even if it should prove a success, might not by itself set free from private work enough labour and plant to absorb the new contracts. At the same time that Sir H. Llewellyn Smith recommended it, he added :—

> " It is, however, probable that we shall ultimately find some form of compulsion necessary in order to ensure both that

[1] See above, p. 25.

[2] *Supply of Labour for Armament Work, Preliminary Note* (23/1/15). HIST. REC./R/180/8.

effective priority shall be given to Government work on existing contracts and sub-contracts, and also that new Government contracts (and sub-contracts) shall be accepted and given priority as compared with private orders already booked. Nothing but compulsion could relieve the contractors from the obligations of their private contracts, and in many cases, therefore, they would welcome such compulsion. It should, therefore, be carefully considered whether the matter can be dealt with by existing regulations under the Defence of the Realm Act or whether new legislation or new regulations would be necessary for this purpose."

Legal advice having been taken, it was found necessary to proceed by way of fresh legislation. The outcome was the Defence of the Realm (Amendment) No. 2 Act.

The problem was discussed in all its bearings at an interdepartmental conference on 12 February, to which the Board of Trade invited Dr. Macnamara and Sir Frederick Black, representing the Admiralty, and General von Donop, Mr. Harold Baker, and Sir George Gibb, representing the War Office. Proposals were put forward for the direct recruiting of labour for the armament firms, that is to say, taking men from employment on private work without their employer's consent. Sir H. Llewellyn Smith urged against this suggestion that it would excite much resentment; that there would be a risk of withdrawing men from what was indirectly work for Government purposes; and that all the possibilities of spreading armament contracts ought first to be exhausted. Another point considered was the compulsory postponement of private contracts to Government work, and the relief of the contractor from such obligations by *force majeure*.

It was decided that the proper course would be to draft a Bill amending Section 1 (3) of the Defence of the Realm Consolidation Act, 1914, which empowered the Admiralty or the Army Council

"(*a*) to require that there shall be placed at their disposal the whole or any part of the output of any factory or workshop in which arms, ammunition, or warlike stores or equipment, or any articles required for the production thereof, are manufactured;

"(*b*) to take possession of and use for the purpose of His Majesty's naval or military service any such factory or workshop or any plant thereof."

In moving the addition of this clause on 25 November, 1914, Mr. McKenna had said:—"These powers are desired to secure that the Government can obtain the highest maximum possible output of the factories or workshops in which arms, ammunition, warlike stores, or equipment are manufactured. . . . These powers may not have to be used. In other cases we have similar powers, and I do not think, except in the case of railways, they have been put into operation; but it is very necessary to have some reserve power of this kind in order to secure the maximum output."[1]

[1] *Parliamentary Debates* (1914), *H. of C.*, LXVIII., 1275.

It will be seen that under this Section the Government already had power to "take over" not merely the armament firms, but any establishment doing munitions work. The Amending Act was not required for this purpose. Its first object was to extend the powers of paragraph (*b*) to cover engineering establishments where no such work was done, and possibly also shipbuilding establishments. Accordingly a clause was drafted extending this power

> "to factories and workshops other than those in which arms, ammunition, or warlike stores or equipment, or articles required for the production thereof are manufactured, and accordingly the said paragraph (*b*) shall have effect as if the word 'such' were omitted therefrom."[1]

In the second place, after paragraph (*b*) two new paragraphs, (*c*) and (*d*), were to be added, which would empower the Government to exercise control over factories and workshops which were not taken over :—

> "(*c*) to require any factory or workshop or any plant therein to be used for the purposes of His Majesty's naval or military service in such manner as the Admiralty or Army Council may direct."

In the Bill as introduced and passed this paragraph reads as follows :—

> "(*c*) to require any work in any factory or workshop to be done in accordance with the directions of the Admiralty or Army Council given with the object of making the factory or workshop, or the plant or labour therein as useful as possible for the production of war material."

In the next paragraph an important change, which will be mentioned later, was made before the Bill was introduced. In the first draft it read as follows :—

> "(*d*) to prohibit or restrict the employment in any factory or workshop of any workman or class of workman whose services may be required for or in connection with the manufacture by or on behalf of the Admiralty or Army Council of any arms, ammunition, or warlike stores or equipment, or any articles required for the production thereof."

These three paragraphs constituted the first printed draft of the Bill, dated 19 February. A further paragraph, which had been accidentally omitted, was added in the second draft (23 February). It dealt with a difficulty which had been discussed at the conference on 12 February, namely the acute shortage of housing accommodation at armament centres such as Newcastle and Barrow. It had been proposed to take powers to billet workmen compulsorily, like soldiers. The Board of Trade representatives questioned the possibility of this, and recommended a more moderate provision, giving powers to take possession of unoccupied premises. Accordingly, the following paragraph was added :—

> "(*e*) to take possession of any unoccupied premises for

[1] This paragraph was verbally amended before the Bill was introduced.

the purpose of housing workmen employed in the production, storage, or transport of war material."

The relief of the contractor from actions for breach of contract was provided for in a second Sub-section, which declared that

> " where the fulfilment by any person of any contract is interfered with by the necessity on the part of himself or any other person[1] of complying with any requirement, regulation, or restriction of the Admiralty or the Army Council " under the Defence of the Realm Acts and regulations, " that necessity is a good defence to any action or proceedings taken against that person in respect of the non-fulfilment of the contract so far as it is due to that interference."

The Bill ended with a definition of " War material " :—

> " (3) In this section the expression " war material " includes arms, ammunition, warlike stores and equipment, and everything required for or in connection with the production thereof."

It will be observed that this very wide definition would cover coal mines, the whole iron and steel industry, the machine-tool trade, and many other industries not directly producing " war material " in the ordinary sense.

The powers of interference with the management of factories, as defined by the Bill, are sweeping and vague. A more detailed statement of the ways in which it was desired to exercise them was given in a memorandum prepared by Sir George Gibb for Lord Kitchener at the end of February. He suggested that the powers to be obtained should cover the following :—

> (1) Power to take possession of and remove from any factories or workshops any machinery, tools, or stores capable of being used for Government work.
>
> (2) Power to enter any works to inspect the machinery, tools, or stores, and the work which is being executed.
>
> (3) Power to compel manufacturers to undertake the production of any articles which they are able to produce and which are required by the Government, in priority to any other work.
>
> (4) Power to require manufacturers engaged on Government work to stop any private work on which they may be engaged and to give priority to Government work.
>
> (5) Power to require manufacturers to stop any private work on which they may be engaged for the purpose of releasing the men employed on such work.
>
> (6) Protection to be given against any claim on manufacturers under private contracts for any breach of contract attributable to compliance with Government requirements.
>
> (7) Power to require from employers returns showing the names and occupations of men and women in their employment.

[1] The words " on the part of himself or any other person " were inserted at the Committee stage, with a view to extending the protection of this clause to sub-contractors who might be indirectly affected.—*Parliamentary Debates* (1915) *H. of C.* LXX., 1475.

III. The Proposal to take over Shipbuilding.

On 12 February Mr. Churchill, then First Lord of the Admiralty, discussed with Sir Francis Hopwood, who represented the Admiralty on the Committee on Production, the negotiations that were being carried on by that Committee for the removal of Trade Union restrictions. He afterwards wrote a Memorandum[1] (dated 13 February) which is peculiarly interesting in that the " taking over " of private establishments, so far from being regarded as a means to securing relaxation, was recommended as an alternative to meddling further with that problem.

Mr. Churchill urged that energy should not be diverted into the labyrinth of difficulties concerning the frontiers between different classes of Trade Union labour. Such negotiations touched deep interests and prejudices and offered a comparatively small gain for work for war purposes. It would be far more fruitful to concentrate the whole forces of labour on Government work, as opposed to merchant work. He suggested that the principle successfully applied to the railways should be extended, for the war period, to shipping and shipbuilding.

He proposed, in the first place, that the Government should take over the whole British mercantile marine for national purposes, and thus prevent the rise of freights, while leaving the fullest incentive to trading.

Secondly, the same should be done for shipbuilding. Power should be taken to requisition, for use or suspension, all shipbuilding work then in progress. All hulls within (say) three months of completion should be finished for national purposes ; all others should be left, when it should be convenient to divert labour from them, the shipbuilder being held free from actions for breach of contract.

The transfer of labour to Government work could be effected by offering a subsistence allowance of £1 a week to men moving to a new district, and guaranteeing three or six months' employment. The Trade Union leaders believed that such a transference from merchant work would fully meet the deficiency of labour for shipbuilding ; and, since shipbuilding was the key to many minor industries, a similar transference from those industries to corresponding employments where the War Office needed labour would be effected.

The first of Mr. Churchill's proposals, namely, the taking over of the mercantile marine, was negatived on grounds which were explained by Mr. Runciman in the House of Commons on 17 February.[2] The taking over of shipbuilding, on the other hand, was contemplated by the Government, and was independently recommended in the Fourth Report (5 March) of the Committee on Production for the same reasons which applied to engineering.[3] The project, however, was dropped ; the Bill does not provide for it, and no reference was made to the subject in the debates.

---

[1] HIST. REC./R/180/38.

[2] *Parliamentary Debates* (1915), *H. of C.*, LXIX., 1184.

[3] See below, p. 69.

IV. Provisions with Regard to Labour.

In the first draft the only explicit reference to labour was contained in paragraph (*d*), which gave power " to prohibit or restrict *the employment* in any factory or workshop *of any workman or class of workmen whose services may be required*" for the production of war material. Before the end of February the state of feeling in the Labour world was such that it was thought politic to remove from the Bill this expression, which might be construed as implying the intention to forbid workmen to remain in employment on private work, and so indirectly to compel them to seek an engagement on Government work, perhaps at a distance from their homes, without at the same time offering them those travelling or subsistence allowances which were at the moment being demanded by the Unions as the condition of any such arrangements.

On 4 March the Cabinet decided that the paragraph should be redrafted as follows :—

> " (*d*) to prohibit or restrict the use of any factory or workshop or of any plant therein for purposes other than those of His Majesty's naval or military forces."

In the Bill as introduced and passed this has undergone further amendment as follows :—

> " (*d*) to regulate or restrict the *carrying on of work in* any factory or workshop, or *remove the plant therefrom, with a view to increasing the production of war material in other factories or workshops*."

The effect of this change was to shift from the Government to the management of the factory the onus of any dismissal of workmen which might follow upon an exercise of the power.[1]

An addition of much greater importance was made in a draft of the Bill dated 26 February, prepared upon Mr. Lloyd George's instructions. Clauses were framed which prohibited strikes and lock-outs and incitement thereto, and enacted the compulsory reference of disputes to arbitration. They ran as follows :—

> " 2—(1) An employer of persons employed on or in connection with the production of war material shall not declare or cause a lock-out ; and if he does so, he shall be liable, in respect of each offence, to a fine not exceeding pounds for each day or part of a day on which the lock-out continues.
>
> " (2) A workman employed on or in connection with the production of war material shall not strike, or, in connection with his work, act in a manner prejudicial to the speedy and proper production of war material ; and if he does so, he shall be liable for each offence to a fine not exceeding pounds for each day or part of a day on which he is on strike.
>
> " (3) A person shall not incite or encourage in any manner any person to act in contravention of this section or aid in any manner any person who is so acting.

[1] The provision of the original draft was restored when this paragraph was amended by Section 10 of the Munitions of War Act, 1915, by the addition of the words : " or other premises, or the engagement or employment of any workman or all or any classes of workmen therein."

"If any person acts in contravention of this provision, he shall be liable in respect of each offence to a fine not exceeding pounds; and if the person so acting in contravention of this provision is a body corporate or a trade union, every officer thereof shall be liable to the same penalty.

"3—(1) If any difference as to rate of wages, hours of work, or otherwise as to terms of employment exists or is apprehended between any employer or employers of persons employed on or in connection with the production of war material and persons so employed, that difference shall be referred, on application made on behalf of the employers or persons employed, to the arbitration of the Board of Trade, and the Board of Trade shall make an award in respect of it.

"(2) The award of the Board of Trade shall be binding on both employers and employed; and if any employer or person employed acts in contravention of, or fails to comply with the award, he shall be liable in respect of each offence to a fine not exceeding pounds.

"(3) The Arbitration Act, 1889, shall not apply to the settlement by arbitration of any difference under this section, but the proceedings on such an arbitration shall be conducted in accordance with rules made by the Board of Trade.

"4—(A section interpreting the meaning of 'lock-out' and 'strike.').

The inclusion of these clauses would have given a completely new turn to a Bill ostensibly dealing with the extinction of commercial work; and they strikingly illustrate the change in the underlying purpose of the promoters of the measure. Mr. Lloyd George's mind was already bent upon the bargain with Labour which was to be concluded, immediately after the hurried passage of the Bill, at the Treasury Conference. From one point of view the enactment of compulsory arbitration was recommended as an alternative method of meeting the agitation against excessive profits. It was urged that excessive profits which employers were found to be making in particular cases would be shared with the workmen in the form of awarded increases of wage. The proposed clauses were, however, cancelled, as likely to embarrass the negotiations then in progress with the workmen on the Clyde and elsewhere. It was hoped that, if the Government should decide to take control of the armament firms, their power to prevent stoppages of work would be greatly increased. In the meantime, provisions for the settlement of disputes without stoppage of work were included in the Treasury Agreement.

This shift in the current of official policy naturally led to a considerable degree of obscurity about the Government's intentions, which was not removed by the ministerial speeches on the Bill in either House. The Government was, in fact, in the position of introducing a very drastic measure for the control of private industry which had only an indirect bearing on the policy immediately in view at the moment. It must further be remembered that the general public as yet knew nothing as to the shortage of munitions. The Bill was described by the Parliamentary correspondent of the *Times* (10 March) as "taking the

House of Commons by surprise." On 9 March Mr. Bonar Law said he had no knowledge "whether we had a shortage of ammunition or of other munitions of war."[1] On this question the Government had every reason to maintain its reserve, and no official speaker went further than Lord Kitchener's statements on 15 March that "the output is not only not equal to our necessities, but does not fulfil our expectations," and that "the supply of war material at the present moment and for the next two or three months is causing me very serious anxiety."[2]

Besides these motives for reticence, it was still uncertain whether industry could not better be developed by the Board of Trade's alternative scheme for spreading contracts.[3] The exhibitions of sample shells and fuses which had been arranged in various industrial centres to test the capacities and willingness of untried engineering firms, were not opened until the day after the Bill was introduced. If the results were good, this policy, which ran counter to the wholesale transference of plant and labour to armament works contemplated by the Bill, might be ultimately preferred.

All these reasons account for the vagueness of the ministerial speeches. It was impossible for the Government to take Parliament into their confidence.

V. The Passage of the Bill.

The Bill was passed very rapidly. It went through all stages in the House of Commons in two days (9 and 10 March), and occupied another two days (15 and 16 March) in the House of Lords, receiving the Royal Assent on 16 March.

In introducing the Bill, Mr. Lloyd George threw the emphasis on the provision for relieving contractors from their obligations. The Government was seeking to extend their powers under the Act, so as to include firms and factories which were not now producing war material, but which "we hope to use, and use very soon."

> "We are not doing so because we have experienced any difficulty with any individual employer or workman, but, at the moment, when we propose a very considerable extension on these lines, we think it is better even for the employers that it should be done in obedience to an Act of Parliament rather than at a request from the Government, because those that are limited liability companies especially have to consider their shareholders . . . and they have also to consider their trust deeds and articles of association." It was also necessary to exonerate them from breaches of contract.[4]

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXX., 1275. This statement must be interpreted in the light of Mr. Bonar Law's words on 21 April: "It is common knowledge—I knew it not as guess-work, but as knowledge—that we were short of ammunition months ago. I ventured to touch on it very gingerly in the House of Commons, from fear of doing harm, but suddenly the thing is shouted from the housetops by Ministers themselves." (*Ibid.*, LXXI. 326).

[2] *Parliamentary Debates* (1915), *H. of L.*, XVIII., 721, 722.

[3] An account of these measures will be given in Part III., Chapter I.

[4] *Parliamentary Debates* (1915), *H. of C.*, LXX., 1271.

On the Second Reading, Mr. Lloyd George outlined the method of procedure and the organisation contemplated, in the following words :—

> " It certainly is not proposed to run this without full consultation with all manufacturers. The idea is that they should be summoned together . . . in their district, and that we should take them into consultation. It is possible that we could get a business man at the head of the organisation. We are on the look out for a good, strong business man with some go in him, who will be able to push the thing through and be at the head of a Central Committee.[1] Then we propose to take all the manufacturers concerned into full consultation. . . . We propose to organise the whole of the engineering community for the purpose of assisting us in increasing the output, and I am perfectly certain we are going to get . . . the willing assistance of them all. . . . When we point out to them that it is not a matter of profit, but a matter of urgent need of their country, I am sure they will render every assistance in their power."[2]

The debate turned chiefly on the question of compensation to the employers interfered with. Mr. Lloyd George said that this question could not be included in the terms of the Bill, but would be dealt with by an impartial tribunal.[3]

On 10 March Mr. Tyson Wilson, speaking for the Labour Party, asked for an assurance that, in " taking over the labour," the Government would see that the wages of men taken from skilled work to do semi-skilled work should not be lowered, and that men transferred from one town to another should receive a subsistence allowance. Mr. Lloyd George replied that the Government were " quite prepared to meet the point by dealing with it on exactly the same basis as they now deal with workmen who are transferred from the dockyards."[4]

Mr. Hewins said that he could not find in the Bill itself or in Mr. Lloyd George's words that the Government had worked out any plan of an organisation to administer it. On this point Mr. Lloyd George would not say more than : " We must have a Central Committee."[5]

---

[1] According to the Parliamentary correspondent of the *Times*, over 2,000 candidates for this position, ranging from commercial travellers to a Peer of the Realm, applied to the Treasury in the next few weeks.

[2] *Parliamentary Debates* (1915), *H. of C.*, LXX., 1277.

[3] The Defence of the Realm Losses Commission was accordingly appointed under Royal Warrant of 31 March, 1915. The Commissioners were :—Mr. Duke, chairman, Sir James Woodhouse, and Sir Matthew Wallace. The terms of reference were :—" To enquire and determine, and to report what sums (in cases not otherwise provided for) ought in reason and fairness to be paid out of public funds to applicants who (not being subjects of an enemy state) are resident or carrying on business in the United Kingdom, in respect of direct and substantial loss incurred and damage sustained by them by reason of interference with their property or business in the United Kingdom, through the exercise by the Crown of its rights and duties in the Defence of the Realm."

[4] *Parliamentary Debates* (1915), *H. of C.*, LXX., 1459.

[5] *Ibid.*, 1467.

Mr. Aneurin Williams expressed the hope that, in taking over industries, the Government would be able to establish better relations between Capital and Labour. "The necessary preparations for the victorious carrying on of this War are very much interfered with by the fact that in many cases the workmen employed find that they are suffering hardships by the diminished purchasing power of their wages, while they also see, or believe that they see, certain employers or contractors getting increased profits." He supposed that industries would be taken over on some such basis as the railways; and he had seen it stated that it was intended to pay previous owners one-fourth of the profits above the average profit of the last three years. "If that is so, I hope there will also be some plan by which a part of the profits shall be paid to or made over for the benefit of the employees."[1]

On this point the Parliamentary Secretary to the Board of Trade, speaking some days later, said:—

> "As regards the possibility of undue profits being made by certain classes of firms, I can only say that I trust that the action of the Government under the latest Defence of the Realm Act may do something to reassure the workers as to their extra services and toil in the interests of the nation. . . . The workers of the country are ready to make any sacrifice and undergo any toil, if they can be satisfied that the nation will get the good of it."[2]

On 15 March, before the Second Reading of the Bill was moved in the Upper House, Lord Kitchener made a speech in which he referred to its provisions. He said that the enormous output required could "only be obtained by a careful and deliberate organisation for developing the resources of the country." The regular armament firms had undertaken enormous contracts, vastly in excess of their normal engagements. Orders had also been spread, both in direct contracts and in sub-contracts, over a large number of subsidiary firms not accustomed in peace to this kind of work. "It will, I am sure, be readily understood that, when new plant is available for the production of war material, those firms that are not so engaged should release from their own work the labour necessary to keep the machinery fully occupied, ... as well as to supply sufficient labour to keep working at full power the whole of the machinery which we now have."[3]

Lord Crewe, in moving the Second Reading, described the Bill as "rather a measure of organisation than of the actual displacement of industry." In bringing it into operation, the Government desired to consult the manufacturers and also representatives of the workmen. He denied that manufacturers generally were thinking only of profits or that workmen generally were guilty of bad time-keeping and drunkenness. But suspicion existed on both sides.

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXX., 1489. [2] *Ibid.*, 1838.
[3] *Parliamentary Debates* (1915), *H. of L.*, XVIII., 722. It will be noticed that the War Office still had in view the original purpose of the Bill, namely, the reinforcement of the armament firms by labour diverted from commercial work. See Part III., Chap. II., Section I.

> "We hope that the general system of consultation and discussion which will take place as the result of the passing of this measure will do much to dispel on both sides those suspicions, unfounded in the main as we believe them to be, so far as they exist. Therefore, my Lords, even if it should prove as some have prophesied—I think Mr. Bonar Law made the statement in another place—that the actual transactions under a measure of this kind are not very numerous—and I think it is exceedingly difficult to say how numerous the actual transactions are likely to be—yet at the same time I venture to think that no small amount of solid national benefit may come from the passage of this measure."[1]

The official speeches on the Bill appear to have left the impression that the Government had not yet decided on any definite line of policy or planned any system of administrative organisation. Such was in fact the case. The last sentences quoted above from Lord Crewe's speech amount to an admission that the Act was passed, not solely for its ostensible purpose, but for the indirect use that might be made of it in settling the dispute between employers and Labour.

Lord Crewe's forecast that the actual transactions under the measure might not be very numerous proved true to this extent, that it was seldom found necessary to put the new powers formally into force. The mere fact of their existence, however, was of great service in the ensuing months, as providing a lever for the coercion of recalcitrant employers whose plant it was desired to turn over to munitions work.

VI. The Limitation of Profits. Fourth Report of the Committee on Production.

At the same time that the Government were securing their new powers over that part of the engineering industry which was not yet engaged in munitions production, they were seeking to obtain some sort of control over the principal armament and shipbuilding firms on the War Office and Admiralty lists. This undertaking in no way involved the new Act, but lay altogether outside its scope. There are three outstanding features of this scheme :—

(1) The works of which it was proposed to "take possession" under the Defence of the Realm Consolidation Act and Regulations were only those of the chief contractors for "armaments"—some forty firms in all.[2]

(2) It was at first intended that the control should be exercised through a Central Committee, analogous to the Railway Executive Committee. This form of administration had been suggested in Mr. Churchill's memorandum of 13 February, and it was again proposed

---

[1] *Parliamentary Debates* (1915), *H. of L.*, XVIII., 724.
[2] These lists of contractors are given in Appendix VIII.

in the Fourth Report of the Committee on Production, which will be summarised below.

(3) With regard to profits, the original notion was, not so much to attach for the Exchequer all profits in excess of a certain standard, as to "compensate" the firms for interference with their business by guaranteeing them a minimum profit and a proportion of any excess. It was under this light that the question of dealing with profits was looked at in the earliest stages, when the operation contemplated could still be properly described as "taking over" or assuming control of the concerns.

The emphasis is for the first time shifted from "compensation" to limitation of profits in a memorandum entitled *A Note on Labour Unrest*, which Sir George Askwith sent to Sir H. Llewellyn Smith on 24 February. This document reflected the experience gained by the Committee on Production in its endeavours to secure the removal of restrictions on output. Sir George Askwith wrote that, throughout the country, Labour men were interpreting the Prime Minister's speech of 11 February on the rise of food prices as an intimation that little could be done to curtail the large profits which contractors were believed to be making. They were drawing the inference that Labour was entitled to higher wages, which were, in fact, in many cases being received. Unless something were done to correct the view that contractors were entitled to unlimited profits, the workmen would claim corresponding freedom; and they had never been in a stronger position to enforce their demands. They might lower their claims, if they could be satisfied that some control was being exercised over contractors to minimise their profits.

In forwarding this memorandum to the President of the Board of Trade, Sir H. Llewellyn Smith wrote: "The situation is serious, but the remedy is not obvious unless we are prepared for wholesale commandeering of armament works; and I fear that that would not necessarily give us the command of skilled management."

The same incidence of emphasis on the need for limiting profits is noticeable in the *Fourth Report* (5 March) of the Committee on Production, which is further remarkable in that it adumbrates the use which might be made of a Government pledge to limit profits in securing the consent of the Unions to a suspension of their restrictive rules. It thus contains all the essentials of the bargain with Labour which was to be made a fortnight later at the Treasury Conference.

The Committee proposed that the Government should assume control of the principal armament and shipbuilding firms. They pointed out that the general Labour unrest of the previous few weeks was accompanied by a widespread belief among workpeople that abnormal profits were being made, particularly on Government contracts. There were consequent demands for higher wages. It seemed to be thought that limitation of profits might be decided to be impracticable, and the men were claiming the freedom to ask the maximum price for their labour. The unrest would prevail while these ideas were abroad.

They recommended that the Government should at once issue a pronouncement, stating clearly that they did not acquiesce in the view that employers and contractors must be left to secure maximum prices and profits.

The control of profits could be effected by the following means: that under the Defence of the Realm Act, with necessary amendments, "the Government should assume control over the principal firms whose main output consists of ships, guns, equipment, or munitions of war, under such equitable financial arrangements as may be necessary to provide for the reasonable interests of proprietors, management and staff."

An Executive Committee, on the lines of the Railway Executive Committee, should be established (*a*) to search for new sources of supply, and (*b*) to exercise continuous and responsible supervision with representatives of the firms concerned. The executive conduct of each business should be left to the existing management.

Besides the removal of the suspicion above indicated, other advantages would accrue. (1) Trade Union restrictions might be more readily removed, when it was known that the Government, not private employers, would benefit. (2) The existence of a central executive with wide authority over the sources of supply, would make possible the control over the output of the various works, the supervision and co-ordination of sub-contractors' work according to relative urgency, and some general regard to efficient and co-ordinated utilisation of labour on private and Government work. (3) Some private establishments would spare labour, if assured that it would be for the direct benefit of the nation.

Such control would enable a confident appeal to be made to workpeople, and would restore national unanimity. It would also impress on the nation that the country was at war and industrial resources must be mobilised.[1]

The recommendations of this Report were adopted by the Cabinet, and Mr. Runciman was entrusted with the task of opening negotiations with the chief contractors.

A preliminary scheme had been outlined by Sir H. Llewellyn Smith in a memorandum dated 1 March.[2] His proposals referred not only to armament firms but, *mutatis mutandis*, to shipyards.

It was pointed out that possession could be taken of the armament firms under Regulation 8 of the Defence of the Realm

[1] This Report was sent to the Prime Minister on 8 March, and first printed as a Cabinet Memorandum. It was decided to delay publication until after the Treasury Conference of 17–19 March. Mr. Lloyd George then again postponed the publication. On 15 April the Committee on Production wrote to the Prime Minister recommending that the Report should be published; but further delay was thought to be desirable. Sir George Gibb again recommended it in a Memorandum to Mr. Lloyd George on 2 June. The Report, however, has never been published, and its contents must be regarded as confidential.

[2] Hist. Rec./R/360/1.

Consolidated Regulations, 1914.[1] Notification of the intention to take possession should go to Messrs. Armstrong, Messrs. Vickers, the Birmingham Small Arms Co., and the Coventry Ordnance Co., at least, and to any other firms the War Office might think necessary. An early date (*e.g.*, 8 March) should be fixed for the operation, with an intimation that the Government would be prepared, shortly after the taking over, to discuss terms of compensation. It was suggested that Government control might last for six months, renewable at their option for six-monthly periods.

Under Regulation 8, every director, officer, and servant of the Companies would be bound to obey the directions of the Army Council. It was suggested that instructions should be given that the work of the various undertakings was to be carried on exactly as at present, subject to any future instructions by the supreme controlling authority. Existing contracts might continue, unless and until modified by mutual arrangement; and future contracts might be arranged, as hitherto, between the War Office and the various controlled Companies.

It was proposed that the control, ultimately vested in the Army Council, should be administered through an Executive Committee, on the lines of the Railway Executive Committee, consisting of representatives of the armament firms with the Secretary of State as nominal chairman and ultimate referee.

The memorandum finally dealt with a method of "compensation" to be based on the rate of profit distributed in the last complete financial year before the War. The ascertainment of the net distributable income promised to be a very intricate matter. It was suggested that the amount should be determined by arrangement between the Company's auditors and an auditor appointed by the Treasury, with a referee in case of disagreement. Pending the determination of the net distributable income, the Companies might be allowed to distribute an interim dividend of 10%. If the net distributable income should fall below 10% the Government should make up the deficit. If it should be more than 10% but less than 12½% (assuming 12½% to be the rate of profit distributed in the last pre-war year), the Government should make up three-quarters of the deficit. If it should exceed 12½%, the Government should take three-quarters of the surplus. An arrangement on these lines would preserve the necessary incentive to economy and good management.

With regard to the basis of compensation, it was decided to

[1] Regulation 8 read as follows: "The Admiralty or Army Council may take possession of any such factory or workshop as aforesaid (*i.e.*, in which arms, ammunition, or any warlike stores or equipment, or any articles required for the production thereof are manufactured) . . . and may use the same for His Majesty's naval or military service at such times and in such manner as the Admiralty or Army Council may consider necessary or expedient, and the occupier, and every officer and servant of the occupier, and, where the occupier is a company, every director of the company shall obey the directions of the Admiralty or Army Council as to the user of the factory or workshop . . . and if he fails to do so he shall be guilty of an offence against these regulations."

consult Sir William Plender, who put forward the following suggestions[1] :—

(1) *Guarantee of minimum profit.*—There were various possible ways of " compensating a Company for the temporary taking over of its undertaking " :

> " (*a*) Guaranteeing to the ordinary shareholders the same rate of dividend as that paid in respect of the last year, or the average during the past three or five years.
>
> " (*b*) Guaranteeing the profit, during the control period, as equalling the profit of the last year, or the average of a series of years, proportionate to the length of the control period.
>
> " (*c*) Guaranteeing the same percentage of profit earned on the turn-over during the control period, as was earned on the turn-over during the last year or average of a series of past years.
>
> " (*d*) Guaranteeing the same ratio or percentage of net earnings on the capital employed during the control period, as was earned in the preceding financial year or average of a series of past years. (By ' capital employed ' is meant share capital, debentures, reserves, and undistributed profits ; and by ' net earnings ' is meant profits before charging interest on debentures and loans forming part of the capital employed.)"

Of these arrangements Sir William Plender recommended (*d*) as the most equitable. It would obviate many controversial questions and give the owners the full ratio of benefits on the capital employed, as above defined, which they had enjoyed in the past.

(2) *Disposal of excess profits.*—Besides the percentage so determined, it might be thought reasonable that the owners should obtain some additional advantage because of the War, since a war between continental powers only would have benefited them greatly, and war directly promotes their business. It was suggested that, if in the control period the profits should exceed the percentage as determined under (*d*), the excess should be divided equally between the Companies and the Government, and that the Companies should, out of their share of the extra profits, consider the claims of their workpeople for greater devotion to duty, and also take full responsibility for settling claims for possible breach of contract with their ordinary customers. To announce that a defined part of the extra profits should pass to the workpeople might create difficulties at Woolwich and other Government works, since the treatment of employees should, so far as the Government was concerned, be as uniform and consistent as possible. It was desirable also to avoid saddling on the Government claims for compensation for breach of contract ; but, if the Companies faced this responsibility, they would need an Insurance Fund, which would be provided by the suggested 50% of the extra profits.

---

[1] *Memorandum to the President of the Board of Trade* (14/3/15). Hist. Rec./R/360/1.

(3) *Special capital expenditure.*—If the Company should incur special capital expenditure at the instance of the Government, it should be entitled to claim for any loss that might arise owing to the assets being unremunerative after the control period. If the Government incurred such expenditure or advanced money, such expenditure or advances would not, so far as the Company was concerned, form part of the capital employed, and interest thereon should be charged against the profits and credited to the Government. The expenditure (*i.e.*, the value of the assets at the end of the period) and advances should be repayable when the control terminated.

(4) *Compensation for losses after the control period.*—It might be necessary to consider whether the Government should make good a proportion of any possible deficiency in profits arising after the control period, but attributable to the intervention.

The memorandum also contained suggestions on minor points, such as the exclusion of part of the Company's undertaking (*e.g.*, Messrs. Armstrong's Italian Company), valuation of stock, and certification of accounts.

It will be seen that Sir William Plender assumed that the Government intended to "take possession" of the armament companies' works under the Defence of the Realm Regulations, and that the management, though remaining the same, would be "controlled somewhat by Government supervision." He accordingly treated the financial arrangements as a question of "compensation" for this interference. But from the outset of the negotiations with the armament companies, begun by Mr. Runciman on 12 March, this intention was abandoned. The companies barred any interference with their direction or management. The idea of control exercised through an Executive Committee was consequently dropped, and the unhappy phrase "taking over," though it continued to be used in reference to these negotiations, ceased to have any meaning in this connection.[1] Since there was to be no interference, there could be no further question of compensation. The issue was thus narrowed down to a purely financial scheme for the limitation of excess profits.

This had, in fact, become the primary object of the Government from the moment when they adopted the Fourth Report of the Committee on Production. The transformation of the scheme was really due to that Committee, which was led by its negotiations with the Unions to see that limitation of profits, with or without any executive control, was the essential condition on which the Unions could be

[1] As late as 21 April the impression was still current that the Government might be intending to control the armament firms in the same way as the railways. On this day, Mr. Samuel Roberts in the House of Commons, speaking as "the only member of the House who is on the Board of one of the large armament companies," and professing to state their position, said: "I do not know what the plan of the Government is, but I gather that they wish—and, if so, we shall not oppose it—to have a certain control during the time of the War. I do not know whether the kind of control is going to be the same as with regard to the railways. But whatever the Government say is necessary, we of the armament firms shall not oppose it." (*Parliamentary Debates* (1915), *H. of C.*, LXXI., 309, 310.)

induced to sacrifice their restrictive practices. The Committee on Production may, therefore, be regarded as the first parent, not only of the Treasury Agreement, but of the controlled establishment.

VII. Negotiations with Messrs. Armstrong and Messrs. Vickers.

Mr. Runciman held a series of meetings on 12, 15, 16, 23 and 26 March, with Sir G. Murray, Mr. Falkner and Mr. Gladstone, representing Messrs. Armstrong's, and Sir Vincent Caillard and Mr. Barker, representing Messrs. Vickers. Mr. Carrington (Armstrong's) was present on 16 March.[1]

After the first meeting on 12 March, Mr. Falkner addressed to Mr. Runciman a letter summarising the suggestions made as a basis for discussion :—

(1) There was no intention of interfering with the direction or management of the Companies. The duties and rights of the directors and management were to remain as at present.

(2) The Companies were prepared to discuss limiting dividends during the War and for a certain period after its close.

(3) To eliminate any suggestion of abnormal profits, all new contracts after 1 March, 1915, should be on the following basis :—

(*a*) The profits on such contracts to bear the same ratio to turnover (selling value) as the profits for the years bore to the turnover of those years.

(*b*) Before arriving at profit, the usual charges for depreciation and other provisions, management and operating expenses, etc., to be made.

(4) Returns from existing contracts, investments, and all rents, royalties, and the like, to be excluded from the arrangement.

(5) The ratio on the above basis to be certified by the Companies' Auditors.

At subsequent interviews these proposals, taken *seriatim*, underwent the following modifications :—

(1) It was confirmed that the direction and management of the Companies should not be interfered with.

(2) The proposal to limit dividends was subsequently incorporated in the next clause, in the form of a provision that the net divisible profit should be limited.

(3) *Meaning of new contracts.*—The basis proposed for new contracts was the subject of further discussion. At the second interview on 15 March, it was agreed that the " new contracts " to be covered by the arrangements should include extensions of existing contracts ; and that, in order to make this clear, the words : " new orders or extensions of existing orders " should be substituted. It

[1] Copies of the Papers relating to these negotiations, HIST. REC./R/360.

was later agreed that the firms should arrange with the War Office the precise meaning of "new orders."

(*a*) *Calculation of Profit.*—The Companies argued strongly in favour of the profits on new orders being allowed to bear the same ratio to turnover as in normal years.

Mr. Runciman criticised this suggestion and pointed out that the turnover would be treble that of normal years. He called attention to the three other methods suggested by Sir William Plender, and expressed his preference for guaranteeing the same ratio or percentage of net earnings on the capital employed as in previous years. Special arrangements could be made as regards the large additional capital expenditure contemplated.

(*b*) *Charges for Special Depreciation.*—It was proposed to add to provision (3) (*b*) of the above scheme the following words :—

> "and after taking off depreciation on the customary scale plus special depreciation for extra wear and tear during the War and special depreciation for such capital expenditure as has been incurred by the companies for the output of war material on an accelerated scale required by the War Office and Admiralty."

It was later (16 March) agreed that the firms should arrange with the War Office the precise definition of the amount which might be written off for depreciation.

On 23 March Mr. Runciman proposed to substitute, for the provision relating to capital expenditure, the following :—"Any capital expenditure specially incurred by the Companies for the execution of Government work shall be allowed for, with due regard to its value to the Company at the end of the war period." This was accepted.

On 26 March the Companies renewed their objection to basing the calculation of profit on capital employed. All their calculations in making contracts were based on turnover. The formula now proposed by the Companies provided—

(*a*) That the profit should be limited so that it should bear the same ratio to output as in the last year or series of years ; and that after deducting the usual charges debited to the accounts before arriving at the profit, and charging for special depreciation due to war work, the surplus remaining should be the final balance of net profit for the year ;

(*b*) That the final balance of net profit for the year must not exceed 20% over and above that shown in the two previous years' balance sheets, after taking account of all the other above provisions.

In the last clause Mr. Runciman suggested that 15% should be substituted for 20%, *i.e.*, that the final balance of net divisible profit should not exceed £1,150,000 for Vickers and £960,000 for Armstrong's.

On 23 March the Companies held out for 20%; and this percentage was finally agreed upon.

(4) *Disposal of Surplus.*—As methods of disposing of any surplus over the net divisible profit, Mr. Runciman suggested—

(*a*) reduction of prices; *or*
(*b*) payment of bonus to the men; *or*
(*c*) a return of it to the Exchequer; *or*
(*d*) any combination of these methods.

On 23 March the Companies objected to (*b*) as likely to lead to trouble with the men. The clause was dropped.

(5) Mr. Runciman agreed to accept the Auditors' certificate that, in arriving at the net divisible profits, the Companies had not departed from the method and principles followed in calculating such profits in previous years.

The preliminary discussions resulted in a draft being drawn up, which was sent to both firms, after the meeting on 23 March. The heads of the draft, as finally amended, may be summarised as follows :—

(1) There was to be no interference on the part of the Government with the direction or management of the Companies.

(2) In arriving at the net divisible profit, the principles followed in previous years were to be observed.

(3) The final balance of net divisible profit must not exceed the average of the two previous years by more than 20%.

(4) Before arriving at the profit, besides the usual allowances for depreciation and expenses of management, etc., charges were to be made for special depreciation for the extra wear and tear during the War, and allowance made for such capital expenditure as the firms had specially incurred for Government work, with due regard to its value to the Company at the end of the War.

(5) The surplus (if any) over the net divisible profit was to be dealt with by—

(*a*) rebate of price, *or*
(*b*) return of it to the Exchequer.

The amended draft was sent to both firms, and both sent a reply accepting it. It was agreed that the arrangement should date from 1 January, 1915, and terminate at the end of the War. The Companies asked for confirmation of the promise that no other firm should be more favourably treated, and requested that no publication should be made till a definite settlement with the Government Departments had been reached.

The heads of the agreement drawn up at the above-mentioned meetings served as a basis for Mr. Runciman's interviews with the

other firms concerned. By 22 May the following firms had been interviewed :—

T. Firth & Sons.
Hadfield's, Limited.
Cammell, Laird.
King's Norton Metal Company.
Coventry Ordnance Works.
Birmingham Metal and Munitions Company.
Birmingham Small Arms Company.
Greenwood & Batley.
London Small Arms Company.
Eley Brothers.
John Brown & Co.
Palmer's Shipbuilding & Iron Company.[1]

VIII. The Proposal that Workmen should receive a Share in Excess Profits.

Something further must be said about one important point in these negotiations, namely, Mr. Runciman's proposal that a proportion of the surplus profits should be made over as a bonus to the workmen. This part of the scheme fell to the ground in consequence of the opposition of the firms. Meanwhile, however, expectations of some such arrangement had been aroused by a passage in Lord Kitchener's speech in the House of Lords delivered on 15 March, three days after Mr. Runciman's first meeting. Referring definitely to these negotiations, Lord Kitchener said :—

> "Labour may very rightly ask that their patriotic work should not be used to inflate the profits of the directors and shareholders of the various great industrial and armament firms, and we are therefore arranging a system under which the important armament firms will come under Government control, and we hope that workmen who work regularly by keeping good time shall reap some of the benefits which the war automatically confers on these great companies."[2]

On the motion for the Adjournment of the House of Commons on 12 May, Mr. Peto called attention to these words.[3] He complained that no arrangements for profit-sharing had been made, and challenged the President of the Board of Trade to say whether Lord Kitchener's statement was unauthorised and could not be carried into effect because the Secretary of State had no authority over private firms.

In reply Mr. Runciman stated that he thought that nearly all the principal firms had already been interviewed. They had been informed

[1] Mr. Runciman decided that it was not necessary to interview Beardmore & Co. (since they were controlled by Vickers) or the Projectile Company; they, like the Coventry Ordnance Co., had (he understood) been working at a loss during recent years, and some special arrangement with the War Office might be needed in both these cases. The seven explosives manufacturing firms on the War Office List were not approached.

[2] *Parliamentary Debates* (1915), *H. of L.*, XVIII., 723.

[3] *Parliamentary Debates* (1915), *H. of C.*, LXXI., 1766, *ff.*

of the Government's intentions, in so far as they could be vaguely outlined at the present time, and in a short time he hoped that it might be possible for the Army Council and the Board of Admiralty to make formal communications to the large firms, showing the directions in which their profits must be limited. The Government had not been able to dictate to the big firms as to the use to be made of the surplus, beyond requiring that it should either be for reduction of price or for return to the Exchequer. That, however, did not relieve the firms from the obligation of treating their workmen well and generously; nor was it inconsistent with Lord Kitchener's statement on 15 March, that workmen should reap some benefit from regular work and attendance. Lord Kitchener's language had been carefully chosen with the object of not binding him to any system of profit-sharing. "In our conferences with the employees of the armaments companies[1] we had discovered that, so far from profit-sharing being regarded by the Trade Unions themselves as a solution of many of the problems by which they were faced, they could not waive any of their demands for the remuneration of labour on profit-sharing lines; that they were not prepared to divert their claims for extra remuneration to those lines; that they themselves did not put forward any demand for profit-sharing; and that the one condition they made, when they agreed with us to restrict some of their Trade Union regulations, was that the profits of these firms should be limited." The Amalgamated Society of Engineers had made no demands for any profit-sharing system. The principle of limitation of profits could not be applied to all the many thousands of firms doing Government work; and it had been agreed at the Treasury Conferences that it would be unreasonable to apply it to firms not wholly or mainly so engaged.

Other speakers asserted that a widespread impression had been created by Lord Kitchener's words that some part of the profits made by the armament companies was to be distributed to their workmen, quite apart from any bargain made at the Treasury Conferences, or any general scheme of profit-sharing. The impression was well-founded, for this had been part of the Government scheme when Lord Kitchener spoke. The proposal was defeated by the armament companies, and it was not revived when the limitation of profits was imposed upon the "controlled establishment" under the Munitions of War Act.

IX. The Outcome of the Negotiations.

The abandonment of the Government's original intention to "take possession" of the armament and shipbuilding works, and the narrowing down of the issue to a mere limitation of profits, led to two curious consequences.

In the first place, it came to light, after the negotiations with the firms had reached the stage above described, that the Government, though they had ample power to "take over" the concerns, had not the power to complete, by way of voluntary agreement, their undertaking to limit profits. The firms, though not for the most part adverse

[1] The reference is to the Treasury Conferences of 17–19 March and 25 March, described below in Chapter IV.

to the agreement, represented that they could not bind their shareholders unless they were themselves bound by the Defence of the Realm Act. For this purpose the Government were advised that an amendment of the Act would be required. The result was that the matter could go no further until the necessary powers had been obtained in those clauses of the Munitions of War Act which institute the "controlled establishment."

In the second place, there now remained no sufficient reason for confining the limitation of profits to the chief War Office and Admiralty contractors. So long as it was a question of "taking possession" of works, it was obvious that the Government could not take over every concern that was making excessive war profits. But from the moment when this intention was given up, the only logical course was to institute a general Excess Profits Tax. It was commonly believed that undue profits were being made, not merely by armament and shipbuilding firms, but in many other industries. The complaints that came from the representatives of Labour were mainly directed against shipping freights and the producers and distributors of food and coal. In comparison with these, the armament firms in particular could plead that they had made enormous efforts in the national emergency, and that a time of war was precisely the time when they counted upon making exceptional profits. Nor could the widespread unrest which had followed upon the rise in cost of living be allayed by reducing the dividends of a handful of companies producing war material for the Army and Navy. Nothing but the extreme urgency of the need for munitions and the pre-occupation of the Cabinet with the immediate measures for meeting it will account for the Government handling the question of excessive war profits on what appears to be so partial, and even inequitable, a basis.

The suggestion of a general tax upon all excessive war profits had been in the air since the time of the debate on Food prices in February. On 3 March Mr. Anderson asked the Chancellor of the Exchequer whether he would cause an examination to be made of the books of Government contractors, and of the ship-owning, farming, food, and coal firms, with a view to ascertaining the present and prospective profits that such interests were making out of the War, and whether he had considered the question of levying a special tax upon profits obtained from the war emergency. Mr. Lloyd George replied that, though the Income Tax authorities did not possess the power to examine books, Mr. Anderson might "rest assured that the profits he mentioned would be fully assessed."[1]

The Budget introduced by Mr. Lloyd George in May, however, contained no proposal of this nature. Towards the end of May the Coalition Government was formed, and Mr. McKenna, immediately after his acceptance of the office of Chancellor of the Exchequer, drew up an outline scheme for the Excess Profits Tax.[2] On 16 June the Government's intention to introduce such a tax was announced by

[1] *Parliamentary Debates* (1915), *H. of C.*, LXX., 780.
[2] *Ibid.*, LXXXII., 1760.

Mr. Montagu.[1] Finally the tax was proposed in Mr. McKenna's Budget speech of 21 September.[2] Mr. McKenna afterwards explained that he could not introduce it earlier, because in May, June and July he had still to carry through his predecessor's Budget.[3] The tax was thus not imposed until after the limitation of profits in controlled establishments had been enacted by the Munitions of War Act.

Meanwhile, the tangible outcome of Mr. Runciman's negotiations in March was that the declared intention to limit the profits, at least, of the chief War Office and Admiralty contractors had considerable influence in inducing the Trade Unions to accept their part of the bargain—the relaxation of restrictive practices—at the Treasury Conference.

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 729.
[2] *Ibid.*, LXXIV., 356. [3] *Ibid.*, LXXXII., 1760.

CHAPTER IV.

THE TREASURY AGREEMENT.

I. Treasury Conference of 17-19 March, 1915. The Treasury Agreement.

The decision of the Cabinet to call a representative meeting of Trade Unionists, with a view to reaching some general understanding with them about the suspension of restrictive rules and practices was taken on 11 March. Invitations were sent out from the Offices of the Board of Trade, in the names of the Chancellor of the Exchequer and of the President of the Board of Trade, for a Conference to be held at the Treasury on 17 March. The form of letter sent to the Trade Unions invited them to send representatives

> " to consult with the Chancellor of the Exchequer and the President of the Board of Trade on certain matters of importance to labour arising out of the recent decision of the Government, embodied in the Defence of the Realm (Amendment) Act, to take further steps to organise the resources of the country to meet naval and military requirements."

The Conference met on 17-19 March. The Government was represented by the Chancellor of the Exchequer (Mr. Lloyd George), the President of the Board of Trade (Mr. Runciman), Mr. Montagu, and Dr. Macnamara. Mr. Arthur Balfour represented the Opposition. Rear-Admiral Tudor represented the Admiralty, and Lieutenant-General Sir J. Wolfe-Murray took the place of Lord Kitchener, who was unavoidably absent. There were also present :—Mr. D. J. Shackleton, Sir George Askwith, Sir Francis Hopwood, Sir George Gibb, Sir Charles Harris, Sir H. Llewellyn Smith, Mr. Harold Baker, M.P., Mr. Beveridge, Mr. Isaac Mitchell, Mr. Cummings, Mr. H. P. Hamilton, and Mr. J. T. Davies.[1]

A list of the Unions represented is given in the *Memorandum of Proposals* drawn up by the Conference.[2] At the first two meetings (17 and 18 March) two representatives of the Miners' Federation of Great Britain attended, but they withdrew at the final meeting on 19 March, and this Federation was not a party to the Agreement. Mr. J. H. Thomas, M.P., representing the National Union of Railwaymen, joined the Conference on 19 March.

---

[1] Verbatim Report of the proceedings at the Conference, Hist. Rec./R/180/17.

[2] Printed below, p. 85.

At a preliminary meeting of the workmen's representatives the following Committee of seven was appointed to conduct the negotiations :—

Mr. Arthur Henderson, M.P., Ironfounders, President.
Mr. William Mosses, Pattern-makers, Secretary.
Mr. Alex. Wilkie, M.P., Shipwrights.
Mr. John Hill, Boilermakers.
Mr. J. Brownlie, Amalgamated Society of Engineers.
Mr. Frank Smith, Cabinetmakers.
Mr. C. W. Bowerman, M.P., representing the Parliamentary Committee of the Trade Union Congress.

This Committee was engaged during the three days of the Conference in considering the terms of the Agreement, and held several discussions at various stages with the general body of delegates. The Committee, as will be seen, afterwards became the National Advisory Committee on War Output, appointed under the Agreement drawn up at the Conference.

In opening the proceedings, Mr. Lloyd George said that those present were invited to consider the need for a larger output of munitions and the steps which the Government proposed to take to organise industry to that end. Every belligerent country had found that the expenditure of war material exceeded all anticipations.

He referred to the very drastic powers taken by the Government under the Defence of the Realm Acts " to assume control or to take over any works in this country which are either turning out munitions of war or which are capable of being adapted for that purpose."

" That is what I want to consult you about. Although we have the power, we cannot exercise it unless we have the complete co-operation of employers and workmen. What does it mean ? I do not want to use the term ' taking over ' without explaining that it is capable of an interpretation which I do not wish to put upon it. By ' taking over ' a works we do not mean to establish an Admiral or a General in command of the works, turning adrift those who are managing them at the present moment ; that is an impossible task. . . . We mean to assume control of works which are now being exclusively devoted to that purpose. There are certain works which are not adapted for that kind of control, but there are others which are ; and the great works which are now being used for the purpose of the production of munitions of war are eminently works of that kind.

" Above all we propose to impose a limitation of profits, because we can quite see that it is very difficult for us to appeal to Labour to relax restrictions and to put out the whole of its strength, unless some condition of this kind is imposed. The workmen of the country, I am perfectly certain, are prepared to put their whole strength into helping the War, so long as they know that it is the State that is getting the benefit of it, and that it does not merely inure to the benefit of any particular individual or class.

" If we are merely to take over the works and assume control and guarantee profits within that limit, you will realise that means that the

employer has not quite the same interest as he has now in limiting expenditure. Therefore, we might be face to face, not merely with the employees making demands upon the State which we for the moment might regard as unreasonable, but we might find the employers in combination with them, and therefore we should have employers and employed combining to bring pressure upon the State, and we should not be in a position to deal with it unless we had a complete understanding in advance. . . .

"What understanding can be asked for? The understanding we must get with the employers is an understanding with regard to the limitation of profits; that we must get, and an understanding, of course, that the works will be completely under the control of the State, to the extent that whatever the State wants done there shall be done. I do not dwell upon these two points; those are matters which I shall have to put before the employers when the time comes."[1]

Mr. Lloyd George then passed to the other side of the bargain, which affected the workmen: (1) that there should be no stoppage of work pending the settlement of disputes; and (2) that Trade Union restrictions should be suspended.

(1) The Government did not say that workmen ought never to complain, or to ask for an increase of wages. "Our point is that during the time the questions at issue are being adjudicated upon, the work shall go on. . . . We want to get some kind of understanding with you about that before we undertake the control of these works. The first proposition, therefore, which I shall put before you for your consideration is this:—

> "With a view to preventing loss of production caused by disputes between employers and workpeople, no stoppage of work by strike or lock-out should take place on work for Government purposes.—

"All this is purely during the continuation of the War, and does not bear on anything that might happen after the War.—

> "In the event of difficulties arising which fail to be settled by the parties directly concerned, or by their representatives, or under any existing agreement, the matter shall be referred to an impartial tribunal, nominated by His Majesty's Government, for immediate investigation and report to the Government with a view to a settlement."[2]

Three forms of tribunal were suggested:—

(*a*) A single arbitrator agreed upon by the parties or appointed by the Board of Trade;

(*b*) The Committee on Production;

(*c*) A court of arbitration on which labour and employers should be equally represented.

---

[1] It had been intended to call a conference of employers, but in the event no general meeting of employers was summoned.

[2] This proposition is textually identical with the Government Notice, *Avoidance of Stoppages of Work on contracts for H.M. Government*, published on 21 February in pursuance of the Second Report of the Committee on Production. See above, Chap. II., Section VI., p. 50.

(2) "The second proposition is the suspension, where necessary, during the War, of all restrictions on output. Here I want to make it perfectly clear that I am only discussing this suspension during the War. . . . There is the question of the number of machines which one man is permitted to attend to. There is the question of the employment of semi-skilled labour where under normal conditions you could not assent to it; and there is the question of the employment of female labour." In France these rules had been suspended.

Mr. Lloyd George then dealt with "the effect which excessive drinking amongst a minority of the workmen, in some districts, has upon the output," and appealed to Labour leaders to support any action which the Government might think necessary.

In conclusion, he said that the Government would not have summoned the Conference if the situation had not been very grave; but it was "difficult to talk about it without creating an impression which is not very helpful for the moment."

MR. ARTHUR HENDERSON said that, while all the representatives present were exceedingly anxious to assist the Government with regard to output, they desired an assurance that the management of concerns under Government control would be prepared to meet the Unions in negotiation. The Railway Companies, which were already controlled, had all either refused to meet the skilled Unions in conference or had ignored requests for such a meeting to discuss an application for an advance of 5s. in wages to meet the increased cost of living. "Something different to the treatment the skilled Unions have received from the Railway Companies will have to be meted out to all the Unions represented here to-day, if we are going to give effect to the Chancellor's desire, so that we can help the Government to keep the peace and to secure the output."

In reply to this point, Mr. Lloyd George pointed out that, if the employers should refuse to confer with the Unions, the machinery for arbitration, which he had proposed, would come into play.

MR. BROWNLIE (A.S.E.) referred to the Shells and Fuses Agreement,[1] and to an arrangement made by his Society with the Engineering Employers' Federation that no stoppage of work should take place without discussion at local and central conferences, with a view to reaching an amicable settlement and avoiding open rupture. The point about which his Society felt concern was, not the settlement of disputes, but the introduction into the engineering industry of unskilled and semi-skilled labour which might oust skilled labour at the end of the War. He also urged that the powers under the Defence of the Realm Acts should be administered, not by Government officials and employers, but by some Board of Control on which Labour should be represented.

In answer to a question as to the restoration of the *status quo*

[1] See above, Chap. II., Section VII. and Appendix VII.

after the War, Mr. Lloyd George said it was the intention to make every firm taking Government work sign a guarantee on the lines of that proposed in the Second Report of the Committee on Production, which he quoted.[1]

The members and representatives of the Government having retired, the Committee of workmen's representatives prepared a draft, which was discussed and explained at a further conference in the evening. This draft contained a proposal that the Government should appoint an Advisory Board, with equal representation of employers and workmen, to assist in securing acceleration of output; to act as an informal court of arbitration; and to exercise control over the conditions of employment.[2] It will be observed that the Agreement in its final form does not provide for the appointment of a Committee with these executive powers. The Advisory Committee mentioned in clause (3), and afterwards known as the National Advisory Committee on War Output, consisted only of workmen's representatives, and its functions were confined to consultation.

The Conference met again on 18 March, but was adjourned to the following day, in order that the draft might be more fully discussed and amended.

On 19 March Mr. Arthur Henderson presented a document which had been accepted with only two dissentients. This Memorandum was signed on behalf of the Government by Mr. Lloyd George and Mr. Runciman, and on behalf of the workmen's representatives by Mr. Henderson and Mr. Mosses. Mr. Lloyd George undertook that each Union should receive enough copies to enable it to send one to each of its members.

The following is the text of the Agreement :—

ACCELERATION OF OUTPUT ON GOVERNMENT WORK.

MEMORANDUM OF PROPOSALS WHICH THE WORKMEN'S REPRESENTATIVES AGREED TO RECOMMEND TO THEIR MEMBERS AT A CONFERENCE WITH THE CHANCELLOR OF THE EXCHEQUER AND THE PRESIDENT OF THE BOARD OF TRADE, HELD AT THE TREASURY, ON MARCH 17TH-19TH, 1915.

The following workmen's organisations were represented :—

Friendly Society of Ironfounders.
British Steel Smelters' Association.
Amalgamated Society of Engineers.
Federation of Engineering and Shipbuilding Trades.
Electrical Trades Union.
Associated Blacksmiths and Ironworkers.
Associated Ironmoulders of Scotland.
National Amalgamated Cabinetmakers.

---

[1] See above, Chap. II., Section VI., p. 50.

[2] The account of the contents of this draft is taken from a statement issued to the Press Association and published in the *Times* of 19 March.

Steam Engine Makers' Society.
General Union of Carpenters and Joiners.
United Patternmakers' Association.
National Transport Workers' Federation.
General Union of Textile Workers.
Amalgamated Society of Carpenters and Joiners.
Boilermakers and Iron and Steel Shipbuilders' Society.
Ship-constructors and Shipwrights' Association.
National Amalgamated Sheet Metal Workers.
United Operative Plumbers' Association.
Gasworkers' and General Labourers' Union.
United Machine Workers' Association.
Associated Iron and Steel Workers of Great Britain.
National Amalgamated Union of Labour.
Workers' Union.
Amalgamated Society of Woodcutting Machinists
Amalgamated Toolmakers' Society.
National Amalgamated Furnishing Trades Association.
National Amalgamated House and Ship Painters and Decorators.
National Union of Railwaymen.
National Union of Boot and Shoe Operatives.
General Union of Braziers and Sheet Metal Workers.
Scottish Painters' Society.
Sheet Iron Workers and Light Platers Society.
Shipbuilding Trades Agreement Committee.
General Federation of Trade Unions.
Parliamentary Committee of the Trade Union Congress.

The Workmen's Representatives at the Conference will recommend to their members the following proposals with a view to accelerating the output of munitions and equipments of war:—

(1) During the war period there shall in no case be any stoppage of work upon munitions and equipments of war or other work required for a satisfactory completion of the War :

All differences on wages or conditions of employment arising out of the War shall be dealt with without stoppage in accordance with paragraph (2).

Questions not arising out of the War should not be made the cause of stoppage during the war period.

(2) Subject to any existing agreements or methods now prevailing for the settlement of disputes, differences of a purely individual or local character shall unless mutually arranged be the subject of a deputation to the firm representing the workmen concerned, and differences of a general character affecting wages and conditions of employment arising out of the War shall be the subject of Conferences between the parties.

In all cases of failure to reach a settlement of disputes by the parties directly concerned, or their representatives,

or under existing agreements, the matter in dispute shall be dealt with under any one of the three following alternatives as may be mutually agreed, or in default of agreement, settled by the Board of Trade.

(*a*) The Committee on Production.

(*b*) A single arbitrator agreed upon by the parties or appointed by the Board of Trade.

(*c*) A court of arbitration upon which Labour is represented equally with the employers.

(3) An Advisory Committee representative of the organised workers engaged in production for Government requirements shall be appointed by the Government for the purpose of facilitating the carrying out of these recommendations and for consultation by the Government or by the workmen concerned.

(4) Provided that the conditions set out in paragraph (5) are accepted by the Government as applicable to all contracts for the execution of war munitions and equipments the workmen's representatives at the Conference are of opinion that during the war period the relaxation of the present trade practices is imperative, and that each Union be recommended to take into favourable consideration such changes in working conditions or trade customs as may be necessary with a view to accelerating the output of war munitions or equipments.

(5) The recommendations contained in paragraph (4) are conditional on Government requiring all contractors and sub-contractors engaged on munitions and equipments of war or other work required for the satisfactory completion of the War to give an undertaking to the following effect :—

> Any departure during the War from the practice ruling in our workshops, shipyards, and other industries prior to the War, shall only be for the period of the War.
>
> No change in practice made during the War shall be allowed to prejudice the position of the workpeople in our employment, or of their trade unions in regard to the resumption and maintenance after the War of any rules or customs existing prior to the War.
>
> In any readjustment of staff which may have to be effected after the War priority of employment will be given to workmen in our employment at the beginning of the War who are serving with the colours or who are now in our employment.[1]
>
> Where the custom of a shop is changed during the War by the introduction of semi-skilled men to perform work hitherto performed by a class of workmen of higher

[1] These first three clauses are taken from the form of undertaking proposed in the Second Report of the Committee on Production. See above, p. 50.

skill, the rates paid shall be the usual rates of the district for that class of work.[1]

The relaxation of existing demarcation restrictions or admission of semi-skilled or female labour shall not affect adversely the rates customarily paid for the job. In cases where men who ordinarily do the work are adversely affected thereby, the necessary readjustments shall be made so that they can maintain their previous earnings.

A record of the nature of the departure from the conditions prevailing before the date of this undertaking shall be kept and shall be open for inspection by the authorised representative of the Government.

Due notice shall be given to the workmen concerned wherever practicable of any changes of working conditions which it is desired to introduce as the result of this arrangement, and opportunity of local consultation with men or their representatives shall be given if desired.

All differences with our workmen engaged on Government work arising out of changes so introduced or with regard to wages or conditions of employment arising out of the War shall be settled without stoppage of work in accordance with the procedure laid down in paragraph (2).

It is clearly understood that except as expressly provided in the fourth paragraph of clause 5 nothing in this undertaking is to prejudice the position of employers or employees after the War.

(*Signed*)
D. LLOYD GEORGE.
WALTER RUNCIMAN.
ARTHUR HENDERSON,
(*Chairman of Workmen's Representatives*).

WM. MOSSES,
(*Secretary of Workmen's Representatives*).

March 19th, 1915.

[1] A point not provided for in this paragraph was the question whether the semi-skilled worker should also receive the guarantee (given according to the practice of some shops to the skilled worker) of his minimum time rate when he was employed on piece-work. The reason of the omission was probably that the practice was not general before the War.

II. Treasury Conference of 25 March. Agreement with the Amalgamated Society of Engineers.

Although the Amalgamated Society of Engineers appears in the list of Unions at the head of the Agreement, the Executive Council of that Society had instructed the representatives not to sign any agreement or to commit themselves to recommending any scheme until the whole report should have been presented to the Council for consideration and endorsement.[1] When it became known that the Society was not pledged to the Memorandum, the Chancellor of the Exchequer, on 20 March, sent an urgent request to the Executive Council that they would summon their local representatives to a further conference.

This second conference was held at the Treasury on 25 March. The Government was represented, as before, by Mr. Lloyd George, Mr. Runciman, Mr. Montagu, and Dr. Macnamara; and Mr. Arthur Balfour was present, as well as representatives of the Admiralty, the War Office, and the Board of Trade. The Amalgamated Society of Engineers was represented by its Executive Council and District Delegates.[2]

MR. LLOYD GEORGE, in opening the proceedings, followed the lines of his speech on 17 March. He appealed to the Society, which had it in its power to make any arrangement impossible, to render its assistance.

MR. BROWNLIE said that the Society was not oblivious of the exigencies of the War, but was also conscious of its responsibilities to its members.

"We number in our organisation something between 178,000 and 180,000 members; of those members, between 150,000 and 160,000 are located in the United Kingdom. And if, as custodians of the trade rights of our fellow craftsmen, it should appear to you that we are somewhat stubborn, obstinate, and indifferent to the needs of the Nation, I can assure you that such is not the case. We are just as jealous and just as anxious that the Nation should come out of this great world struggle triumphant, and that we shall kill Prussian militarism for all time, as anybody can be. But our spirit in this problem may be likened to the attitude taken up by the Barons of old, who were called upon to forgo what they considered to be their rights and privileges within the Kingdom.. The Government has taken over, or, at all events, is contemplating taking over, workshops, factories, and shipyards. But there was a time in the history of the country when the Government did not control the Army, or Navy, and when, to some extent, the armed forces of the Nation were under the control of private individuals, who were great and mighty Barons. And, Sir, just as these people fought strenuously and tenaciously against the relaxation of any of their rights, or forgoing what they considered to be the heritage handed down to them by their forefathers for untold generations in the interests of the Nation, we on the other hand have to view

[1] A.S.E. *Monthly Journal and Report*, April, 1915, pp. 17, 19.
[2] Verbatim Report, HIST. REC./R/180/18.

the problem in a somewhat similar manner, as we are relaxing trade rights which have been won at much sacrifice by our forefathers."

Mr. Brownlie explained that no decision had yet been reached with regard to the Memorandum drawn up at the previous conference. The Executive Council had neither rejected it nor decided to recommend it.

MR. BUTTON claimed that, so far as the production of ammunition was concerned, the Society had already met the case by the Shells and Fuses Agreement of 5 March. So soon as a similar need should arise in any other branch of the industry, the Society was willing to meet the Government. "But to ask us, as your Agreement does ask us, to allow the introduction of semi-skilled and female labour into all branches of the engineering trade, is something which, at the moment, we are not prepared to agree to." In what other branch were relaxations required? Torpedoes were out of the question. In the rifle trade, fully skilled men were employed only in the higher branches, and the conditions required practically prevailed there already. In gun manufacture, the Agreement already operated in the roughing stages; in the later stages a high degree of skill was essential to good workmanship. It was for the Government to prove that any further extension of the Shells and Fuses Memorandum was necessary.

Mr. Button also demanded that, for the satisfaction of the Society's members, the definite terms of any agreement reached with the employers as to limitation of profits should be laid before them.

MR. LLOYD GEORGE said in reply that he agreed with Mr. Button's main proposition. "I want a general agreement with you upon principles. I quite agree that you should not be called upon to sweep away all the safeguards which protect your industry and your order, and give us a blank cheque, as it were, in the matter . . . We simply want exactly what Mr. Button has said he is prepared to concede. We want from you that, whenever we can demonstrate to you that it is necessary, in order to increase the output of munitions of war in any particular direction, for the moment to introduce semi-skilled and female labour, you will agree. That is all we ask you.

"In regard to the second proposition that you should have a guarantee that you will not be doing these things merely in order to benefit individual companies, or firms, or shareholders, that we are now seeing to, and we are now negotiating upon that basis. It is true that we shall probably have to employ individual firms to assist in the output without taking them over. We cannot undertake, for instance, to take over every firm that we employ. I will tell you what I mean. There are certain firms which turn out munitions of war exclusively. So far as they are concerned, we propose to impose these restrictions upon their profits. That bears upon the bulk of your trade as far as munitions are concerned. But there may be another firm which is turning out something else in the main, which we employ to assist us. We cannot undertake to control a business in which we are not for the moment concerned. Supposing it is motor-cars; or let us take another case, which is even better for our purpose. Supposing you have a

very considerable concern, which is turning out mining machinery or repairing mining machinery. We might say: 'We do not want to stop all your mining machinery, and we do not want to stop your repairing mining machinery, nor do we want to take over the business of making or repairing mining machinery; therefore, you carry on your business as far as that is concerned; but we do ask you to give us 50,000 shells a month.' I will take that figure for the sake of argument. We should not take over a concern of that kind; you could not expect us to take it over, because the bulk of the business would still be something which we cannot really control, or undertake to control. In that case, you could not impose the same restrictions, because there you would be entering upon a part of the business with which we have nothing whatever to do. But so far as we take over works and confine them exclusively to this purpose—I am now talking about your trade—in that case, we are not merely intending to restrict the profits, but we are at the present moment negotiating for the purpose of doing so."

The points raised in the discussion which followed may be grouped under several heads.

(*a*) THE RESTRICTION OF THE AGREEMENT TO WAR WORK.

Referring to the Chancellor s speech last quoted, MR. KAYLOR[1] said: "In your explanation in regard to mining machinery, you said that if four-fifths of the work done was in making mining machinery, you could not interfere with the profits arising from the production of that mining machinery. Then I take it that we should not be called upon to relax any conditions in regard to the four-fifths of the work, but would be asked only to relax conditions in regard to the one-fifth which belongs to the category of war munitions?"

MR. LLOYD GEORGE: "You may make any conditions you like with the employers with regard to the part of their business with which the Government is not concerned. You must make your own fight in regard to that. We only want relaxations for the purpose of turning out munitions of war. In regard to other work, any question that arises is between you and the employers."

MR. HUTCHINSON[2] later put a question on paragraph (4) of Clause 5 ("Where the custom of a shop is changed during the War by the introduction of semi-skilled men to perform work hitherto performed by a class of workmen of higher skill, the rates paid shall be the usual rates of the district for that class of work"). Mr. Hutchinson asked: "Are we to understand . . . that this shall not apply to any commercial work, and that it will only apply to work which is wanted specifically by the Government for war purposes?"

MR. LLOYD GEORGE: "Yes."

MR. HUTCHINSON: "And only in the shops which the Government are taking over for the War?"

---

[1] *Report*, p. 18. [2] *Report*, p. 24.

Mr. Lloyd George: "No; it will apply in the shops the Government are not taking over, for war work."

Mr. Hutchinson: "But it is for war work only?"

Mr. Lloyd George: "Yes; otherwise we could not extend our operations."

(*b*) Safeguard for the restoration of conditions in the case of new inventions introduced during the War.

Mr. Ryder[1] raised a question which had been overlooked in earlier discussions. In connection with some new invention, unskilled or semi-skilled labour might be introduced on what would normally be skilled work. In this case there would be no pre-war practice to appeal to, and the employers would be likely to continue with unskilled labour after the War.

This point was dealt with in the Agreement drawn up after this Conference.

(*c*) The Government to certify that work is for war purposes.

Mr. James[2] asked that the Government should certify whether work in which it was proposed that conditions should be changed was work for war purposes.

This point also was dealt with in the Agreement.

After adjournment, Mr. Brownlie reported that the assent of the Society's representatives would depend upon the answers to four points, which were stated as follows:—

"(1) Profits which may accrue as a result of any relaxation of trade restrictions or trade practice.

"(2) Whether the relaxation of any trade practice, as suggested in the Memorandum, is only applicable to the production of work for war, and during the war period only.

"(3) Whether, in the case of any introduction of new inventions which were not in existence in the pre-war days, which call for the operation of skilled workmen, such work will be considered as the work of skilled workmen; and, if it is necessary that semi-skilled workmen be called upon to do such work, that also will be viewed in the light of pre-war days.

"(4) That the Government Department shall endorse any application for relaxation of trade practices or customs in connection with war work during the war period."

Mr. Lloyd George replied to these points in the following terms:—

"(1) I adhere to the statement I made before, that, with regard to any relaxation that you consent to, we shall make arrangements to the best of our power that these shall not inure to the financial advantage of the employing firms and companies, but entirely to the advantage

[1] *Report*, p. 26. [2] *Report*, p. 28.

of the State. . . . We are already negotiating upon that basis. . . . I think that is a perfectly fair demand."

"(2) We are only urging you to make these relaxations in respect of the war work. It is in order to increase the output of war munitions, and we have no concern, as a Government, with the arrangements which you make with the employers in respect of other work."

"(3) It is perfectly true . . . that you have no rule, at the present moment, which is applicable to any absolutely new invention; but still it is analogous to something which is done at the present moment, and therefore the same rule would apply."

"(4) I understand it is . . . for the purpose of enabling the workmen to feel that the Government undertake the responsibility to see that the *status quo* is restored. As I understand, they want to bring us in, I think, quite rightly. They say: 'We cannot trust the individual employers and firms, and therefore we must feel that the Government realise it is also their responsibility to support us in restoring the *status quo*.' I think that is perfectly fair.

"I have had an opportunity during the interval of consulting with Mr. Balfour upon this subject. I need hardly tell you that is a very important matter, because Governments come and go, and it is rather important you should have a distinguished and dominant personality of the other great party of the State express his views on that point. He feels that quite as strongly as I do."

Mr. Balfour: "That is a matter of honour."

Mr. Lloyd George: "It does not mean that any rules and regulations are going to be like the laws of the Medes and Persians. But that is a matter you will have to fight among yourselves at a future time. Our business is to see, if you press it, that the *status quo ante bellum* is restored; and Mr. Balfour takes exactly that view. You have relaxed your rules for the purpose of the War, and during the War, and you have done it at the request of the Government. You have done it for the benefit of the State, for a particular purpose, and during a particular period. Therefore, we feel that, if, at the end of that period, you are of opinion that the pre-war conditions should be restored, it is an obligation of honour on our part to support your claim in that respect."

After the termination of the meeting, the following memorandum was signed on behalf of the Government and the Engineers' Society:—

Acceleration of Output on Government Work.

At a meeting held at the Treasury on 25 March, 1915, between the Chancellor of the Exchequer and the President of the Board of Trade and the Executive Council and Organising District Delegates of the Amalgamated Society of Engineers, the Chancellor of the Exchequer explained the circumstances in which it had become essential for the successful prosecution of the War to conclude an agreement with the Trade Unions for the acceleration of output on Government work. After discussion the representatives of the Amalgamated Society of Engineers

resolved that, in the light of the Chancellor of the Exchequer's statement and explanations, the agreement be accepted by the Union, and expressed a desire that the following statements by the Chancellor of the Exchequer in answer to questions put to him as to the meaning of various clauses in the Memorandum agreed upon at a Conference with Workmen's Representatives on 17-19 March, be put on record :—

(1) That it is the intention of the Government to conclude arrangements with all important firms engaged wholly or mainly upon engineering or shipbuilding work for war purposes, under which their profits will be limited, with a view to securing that benefit resulting from the relaxation of trade restrictions or practices shall accrue to the State.

(2) That the relaxation of trade practices contemplated in the agreement relates solely to work done for war purposes during the war period.

(3) That in the case of the introduction of new inventions which were not in existence in the pre-war period the class of workman to be employed on this work after the War should be determined according to the practice prevailing before the War in the case of the class of work most nearly analogous.

(4) That on demand by the workmen the Government Department concerned will be prepared to certify whether the work in question is needed for war purposes.

(5) That the Government will undertake to use its influence to secure the restoration of previous conditions in every case after the War.

D. LLOYD GEORGE.
WALTER RUNCIMAN.
JAS. T. BROWNLIE (Chairman of Executive Council of Amalgamated Society of Engineers).
WM. HAROLD HUTCHINSON (Member of Executive Council).
GEORGE RYDER (Organising District Delegate).
ROBERT YOUNG (General Secretary).

The importance of this Memorandum lies chiefly in two points. It contains the first written pledge that the profits of " all important firms engaged wholly or mainly upon engineering and shipbuilding work for war purposes " should be limited. Secondly, it for the first time bound the Government to use its influence in securing the " restoration of the previous conditions in every case after the War." This clause does not include the proviso contained in Mr. Lloyd George's verbal pledge at the meeting : *" if at the end of that period you are of opinion that the pre-war conditions should be restored "* ; but, in any case

the mention or omission of this qualification makes no practical difference. From this moment the Government was bound in honour to see that, where the fulfilment of the pledge was claimed by the Unions, the conditions varied under the Agreement should be restored as they were before the War.

In the Amalgamated Society of Engineers' *Journal* for April (p. 67), the General Secretary wrote as follows :—

> " To avoid even the possibility of defeat (in the War) the Government has been urging the relaxation of Trade Union restrictions. These restrictions are necessary, and have been imposed to safeguard the standard of life of skilled workers. Any relaxation of these economic safeguards must be jealously controlled in the interests of the workers. The interests of the engineers are probably more affected than those of any other trade. Yet, when the interests of the State are involved, relaxations may become necessary.
>
> " The policy of your officials has been : no relaxation of trade regulations until good and satisfactory cause is shown for its necessity. It is because good and definite reasons have been given that the ballot on shells and fuses became necessary.[1] It is because good cause has been shown that the memorandum arising out of the Conference with the Chancellor of the Exchequer has been signed. The best safeguards possible have been got. The members should, therefore, follow the lead of their officials. The work must be done. We believe the work will be done. The nation cannot afford to wait. Men and masters, if need be, will be wise to accept the Government's arrangement. If we abide by the arrangements, our safeguards will be respected. If the arrangement is disregarded, penal statutes may become operative. It is, therefore, in the interests of the men employed on munitions of war, as well as in the interests of the nation, that no stoppage of work should take place, that losing time should be avoided, and that differences *re* wages and other conditions of employment should be settled by the machinery created for the war period."

Subject to the additional pledges and explanations given in the Memorandum of 25 March, the Executive Council of the A.S.E. recommended their members to accept the Treasury Agreement.[2] It was confirmed by ballot of the whole Society, but not until 16 June, 1915 The voting was : 18,078 for ; 4,025 against.

III. The Form of Guarantee given by Government Contractors.

Shortly after the Conference, Sir George Askwith addressed a letter to the Admiralty and the War Office with reference to the form of the employers' undertaking.

He said that the question had been raised whether the guarantee

---

[1] See above, Chap. II., Section VII. and Appendix VII.

[2] A.S.E. *Monthly Journal and Report*, May, 1915, p. 5.

in the Treasury Memorandum was to be substituted for the form given in the Second Report of the Committee on Production.[1] The Shipbuilding Employers' Federation were not signing the latter, pending a decision on this question. The Committee on Production thought that the Treasury formula should be adopted. They had been informed that contractors to the War Office and the Admiralty had been asked, some time ago, to sign the guarantee in the Committee's Report, and that some of them had done so; and further, that the War Office had since asked their contractors to sign the Treasury form. The Committee thought that those contractors who should not reply or sign should not be pressed to do so. It would suffice if contractors and sub-contractors were informed, as occasion arose, that the Treasury guarantee was an implied condition of all contracts.

In accordance with the suggestion contained in the above letter, the following Notice was issued to Admiralty Contractors :—

> "Acceleration of Output on Government Work.
>
> "It is hereby notified that all work performed for the Admiralty during the period of the War, whether under direct contract with the Admiralty or by sub-contractors, is regarded as work within the scope of the arrangements contained in the enclosed Memorandum of 19th March. In view of the national necessity for accelerating the output of work for the Admiralty, the undertaking required by paragraph 5 of the Memorandum will be regarded by the Admiralty as accepted by all employers concerned in the case of contracts and sub-contracts now current, and will be a condition of all future contracts entered into by the Admiralty during the War.
>
> "This announcement is made by the Admiralty in full confidence that all employers will be willing in the national interest to conform to this requirement."

On 29 March the War Office issued a circular agreed upon between Sir Charles Harris and Mr. Lloyd George, requesting their contractors to sign a printed form of undertaking which was enclosed. This embodied all the conditions laid down in paragraph 5 of the Agreement.[2]

IV. The National Advisory Committee on War Output.

The Treasury Agreement of 19 March provided in clause (3) for the establishment of an Advisory Committee, representative of the organised workers engaged in production for Government requirements, to facilitate the carrying out of the recommendations and for consultation by the Government or by the workmen.

On 31 March the members of the Committee of workmen's representatives which had been appointed to negotiate the Agreement, were summoned to the Offices of the Chief Industrial Commissioner.

---

[1] See above, Chap. II., Section VI., p. 50.

[2] 94/Gen. No./34. Copies of the Circular and Undertaking are given in Appendix IX.

Sir G. Askwith announced that all the members of the Committee had been invited, and had consented, to serve on the National Advisory Committee on War Output.

It was decided by this Committee on 31 March that local Advisory Committees should be appointed in the chief engineering centres, the nucleus being formed by the local district Committees of the Federation of Engineering and Shipbuilding Trades, with representatives co-opted from societies which were not represented on those bodies, but whose members were engaged in the production of war material. These enlarged Local Committees were to be requested to appoint sub-committees for their own and adjacent districts, whose function would be to collect information as to impending labour difficulties, to co-operate with their central Committees and the National Advisory Committee in preventing stoppages or curtailment of work, and to facilitate in every way the output of war material.[1]

The Executive Council of the Amalgamated Society of Engineers at first refused to recognise the National Advisory Committee. Later, however, on the initiative of the Committee, these differences were adjusted on the following basis :

> " In all cases where the National Advisory Committee on War Output find it necessary to send a deputation to any district with a view to a settlement of any difficulty in which engineers are involved, it is agreed that the Executive Council of the Amalgamated Society of Engineers be invited to elect a member of the deputation to visit the district concerned along with the Committee's representatives and at its expense."

On these terms the Amalgamated Society of Engineers promised its co-operation.[2]

V. The Failure of the Treasury Agreement.

The document signed on 19 March, though commonly known as the " Treasury Agreement," was, strictly speaking, a " Memorandum of Proposals." It bound the workmen's representatives at the Conference to recommend these proposals to their members ; but, until a favourable ballot of each Society should have been taken, no Union was committed. Even when any particular Union had expressed its assent, paragraph (4) only bound it " to take into favourable consideration " such changes of working conditions or trade customs as might be necessary for the acceleration of output. It was not committed to the suspension of any given rule or practice—to enumerate these, varying as they do from trade to trade, would of course have been impossible—and further, in every case, the question whether a particular change was necessary for the purpose specified might be open to dispute. There was evidently much room for the play of obstructive

[1] The Armaments Output Committee issued in April a circular laying down a constitution for local Advisory Committees. See Part III., Chap. IV. Section IV.

[2] The correspondence confirming this agreement was laid before a meeting of the National Advisory Committee on 8 June.

forces between the signing of the document on March 19 and the actual suspension of a single restriction by any one society.

The event proved that it was one thing to draw up the Treasury Memorandum on paper, another thing to induce the general mass of workmen to pay attention to its provisions. Three months passed before the Government's pledge to limit profits was given legislative sanction in the Munitions of War Act of 2 July, 1915. There was a corresponding delay on the side of the Unions. On 9 June, a deputation from the Emergency Committee of the Shipbuilding Employers' Federation, was received at the Board of Trade. The Executive Board of this Federation had itself agreed, on 26 May, that all the federated firms engaged on Government work should accept the Treasury Agreement; but the deputation stated that "in most cases" the workmen's organisations represented at the Treasury Conference "had not approached their members in the matter at all." The Amalgamated Society of Engineers had by that date submitted the proposals of the two Memoranda, but the men's vote was not to be taken till 16 June. The Shipwrights' Society had attached to the Memorandum of 19 March a supplementary agreement of their own, which they demanded that the employers should sign before they would allow their men to accept any work. The deputation summed up the position in the statement that the Agreement of 19 March had "practically never become operative."

The principal cause of this failure is clearly stated in the concluding paragraphs of a *Memorandum on Labour for Armaments* by Sir H. Llewellyn Smith, dated 9 June, 1915,[1] as follows:—

> "The difficulty, as it has been expressed both by workmen's representatives at" the two Treasury Conferences "and by employers themselves (as in the Shipbuilding Employers' deputation received to-day) is that the workmen, though engaged on armament work, still feel themselves to be working essentially for private employers, with whom they have only a 'cash nexus,' and that in the present circumstances a 'cash nexus' is quite inadequate to secure control....
>
> "So long as contractors' profits are not brought under control, the workmen feel that any sacrifice they may make of their rules and restrictions will directly increase the profits of private persons, and their unwillingness to make the sacrifice is made almost insuperable by this suspicion."

A subsidiary cause, which the same Memorandum illustrates, was that the men were by this time "to a very considerable extent out of the control both of the employers and of their own leaders." During these months Labour had been more and more rapidly escaping from all the influences of economic circumstance and disciplined organisation which tend to control it in normal times. Almost any workman of any pretensions to skill in the engineering and shipbuilding trades had so little difficulty in finding work the moment he wanted it, that he had

[1] Hist. Rec./R/320/1.

little motive left for remaining with his employer, if he was in any way dissatisfied, whether with good reason or without. This economic freedom of the individual workman tended, of course, to remove also the normal motives for submitting to Trade Union discipline and to the guidance of the Labour leader. The men were becoming more than commonly impatient of the moderation of Union officials, and inclined to ignore or to repudiate any compacts they might make with Government Departments or federations of employers. Throughout these three months, employer and Labour leader alike more and more found themselves left in the air, while the rank and file, whose suspicion that the employers had the best of the bargain could be fired by any spark of irresponsible agitation, went as they pleased, or put forward demands, backed by threats of stoppage, either for better terms or for the perpetuation of restrictions which their leaders, but not themselves, had bargained away. In some cases, such demands were supported by the leaders of Unions which were not finally committed to the Agreement. The attempt of the employers to obtain the removal of restrictions was resolving itself into a long struggle to get them surrendered piecemeal.

The Memorandum of 9 June cited above records that threats of stoppage were then common, and actual stoppage by no means rare. The elaborate machinery for arbitration set up in the Treasury Memorandum was in some cases ignored, in others rejected.[1]

It must be borne in mind that this Memorandum is based chiefly on employers' evidence, and naturally puts forward the points still calling for remedy, without reviewing the more successful aspects of the situation. Nor must it be forgotten that, while profits and prices were left free to rise, the burden of sacrifice was thrown wholly on the workman, who knew that the fruits of that sacrifice, to a large extent, were reaped by private capitalists, and that nothing but an undertaking of doubtful value stood between the temporary surrender of cherished rights and a permanent deterioration of his standard of living. It would probably be impossible to obtain any complete evidence as to the extent to which relaxation of restrictions had been actually secured by this date as a consequence of the Agreement. But the mere fact that it was necessary to embody the bargain for removal of restrictions on the one side, and limitation of profits on the other, in the Munitions of War Act, is sufficient proof that the early voluntary negotiations had failed to secure their object.

[1] Further evidence on this subject will be given in Part IV.

APPENDICES.

APPENDIX I.

(CHAPTER I., p. 1.)

Memorandum as to Minimising of Unemployment during the War.

In order to assist as far as possible in minimising the evils of unemployment which must in some districts arise as a result of the War, it is particularly desired that, in the execution of Army orders, Contractors shall act upon the following suggestions to such extent as they reasonably can, *viz.* :—

(1) Rapid delivery to be attained by employing extra hands, in shifts or otherwise, in preference to overtime, subject always to the paramount necessity of effecting delivery within the times requisite for the needs of the Army.

(2) Subletting of portions of the work to other suitable manufacturers situated in districts where serious unemployment exists, although contrary to the usual conditions of Army Contracts, is admissible during the present crisis, and it is desired to encourage such subletting on the following conditions, *viz.* :—

(*a*) The main Contractor to remain solely responsible for due execution of the contract as regards quality, dates of delivery, and in every respect.

(*b*) The Fair Wages clause to apply strictly, with the exception of the passage prohibiting subletting. The main Contractor to be responsible for subletting only to manufacturers who will undertake to observe the other provisions of the Fair Wages clause.

(*c*) Names and addresses of all Firms to whom it is proposed to sublet work to be submitted for approval before work is actually given out to them.

(*Signed*) H. DE LA BERE,
Director of Army Contracts.

War Office,
August, 1914.

APPENDIX II.

(CHAPTER I., p. 3.)

The Effects of Enlistment on the Industrial Population.

TABLE I.

The total effect of enlistment is shown in the following table of the state of employment in April and July, 1915, compared with employment before the War (*Board of Trade Report on the State of Employment in the United Kingdom in July*, 1915, Part I., p. 3) :—

Trade Groups.	Approximate industrial population (Census, 1911).	Percentage of Numbers employed in July, 1914.					
		Contraction (−) or expansion (+) of numbers employed.		Known to have joined the Forces.		Net displacement (−) or replacement (+)	
		April	July	April	July	April	July
Shipbuilding ..	164,000	+ 6·5	+10·8	15·3	16·5	+21·8	+27·3
Engineering ..	588,000	− 7·3	− 3·2	17·5	19·5	+10·2	+16·3
Electrical Engineering ..	77,000	− 5·9	− 5·8	20·5	23·7	+14·6	+17·9
All trades ..	6,373,000	−10·8	−11·8	17·3	20·2	+ 6·5	+ 8·4

TABLE II.

EFFECT OF ENLISTMENT ON SMALL ENGINEERING FIRMS.

Number of small firms.	Number of males employed, July, 1914.	Number enlisted		Total enlisted by 15 April.
		Up to Feb., 1915.	February–15 April.	
985	33,451	5,500 (16·4%)	599 (1·8%)	6,099 (18·2%)

NOTE.—On 6 May, Mr. Layton, in reporting these figures, stated that in the case of both large and small engineering firms the increase (since February) in the percentage of enlistment was over 2 per cent. in London and Scotland; for small firms, over 2 per cent. in the Midlands; for large firms, small in the Northern, West Midlands, and South-Eastern (including Enfield, Erith, Ipswich, etc.) Divisions.

TABLE III.

Percentage and amount of enlistment since the outbreak of War, and from 16 April to 16 July, 1915, in the metal trades, exclusive of the work of any such trades undertaken by railway companies :—

Trade.	Total enlistment up to 16 July, 1915.		Enlistment between 16 April and 16 July, 1915.	
	Percentage on Service.	Numbers on Service.	Percentage known to have joined the Forces.	Numbers known to have joined the Forces.
Iron and Steel ..	18·2	47,800	1·8	4,121
Wire-drawing ..	18·1	7,800	1·9	675
Hardware, etc. ..	20·9	15,400	3·3	2,091
Engineering ..	19·5	90,700	1·9	7,279
Electrical Engineering	23·5	12,000	3·2	1,408
Shipbuilding ..	16·5	24,700	1·2	1,615
Cycles and Motors	23·6	20,700	3·2	2,428
Railway Carriages	20·0	3,900	2·6	448
Carriage, Cart, etc.	19·8	2,500	3·8	422
Cutlery, etc. ..	17·3	7,300	2·1	791
Small Arms ..	16·9	750	1·1	45
Scientific Instruments	17·4	2,600	2·3	298
Other metals ..	20·9	13,400	2·4	1,325
Totals ..		249,550		26,450

APPENDIX III.

(CHAPTER I., p. 9.)

Lists given in the Statistical Supplement to Sir H. Llewellyn Smith's Memorandum on the Limits of Enlistment, January, 1915.

LIST A.

Essential occupations from which practically no further labour could be drawn.

	Unenlisted balance physically capable of military service (in thousands).
Iron and Steel	99
Shipbuilding	46
Engineering	179
Woollen and Worsted	44
Boots and Shoes	64
Leather, etc.	29
Chemicals	36
Hosiery	6
Food	62
Cycles, Motors, and Railway Carriages	38
Central Government	56
Railways and Docks	213
Add for salaried persons, etc., in these trades	80
Total	952

LIST B.

Occupations that might spare a certain proportion of the balance.

These were divided into three categories, according to the proportion of labour of military age and capacity that might be drawn from them, namely—

(1) one-fifth ;
(2) a quarter to one-third ;
(3) a half.

		Unenlisted balance of men physically capable of military service (in thousands)	
Category 1	Mining	375	
	Agriculture and Fishing	539	
	Clothing	70	
	Local Government	46	
			1,030
Category 2	Furniture, Timber, etc.	72	
	Glass and Pottery	25	
	Cotton and other textiles	96	
	" Other " Metal	167	
	" Other " Transport	270	
	Other Miscellaneous	46	
			676
Category 3	Building	239	
	Brick, Stone and Quarries	60	
	Brewing and Tobacco	38	
	Paper and Printing	78	
	Professional	125	
	Domestic	151	
	Commercial	250	
	Dealers, etc.	361	
			1,302

APPENDIX IV.

(Chapter I., p. 28.)

Labour for Armament Firms.

Board of Trade Labour Exchanges Central Clearing House.

Return of Placings for the periods,
1/8/14 to 13/3/15 and 1/1/15 to 13/3/15.

Firm or Factory.	For Period 1 August, 1914, to 13 March, 1915.				For Period 1 January, 1915, to 13 March, 1915.			
	British.		Belgian.		British.		Belgian.	
	Men and Boys.	Women and Girls.	Men and Boys.	Women and Girls.	Men and Boys.	Women and Girls.	Men and Boys.	Women and Girls.
Armament Firms* ..	10,843	2,146	609	41	4,216	795	199	—
Woolwich, Enfield and Greenock	14,086	—	†	†	3,899	—	†	†
Grand Totals	24,929	2,146	609	41	8,115	795	199	—

* The firms supplied were: Armstrong's (Alexandria, Elswick), Coventry Ordnance, Vickers (Crayford, Erith, Barrow, Sheffield), B.S.A., Babcock & Wilcox (Renfrew), Beardmore (Glasgow), Hadfield (Sheffield), Firth (Sheffield).

† Areas to which Belgians had not been sent.

APPENDIX V.

(CHAPTER I., p. 28.)

Table of increases in numbers employed in Government Factories and Armament Works, 3/4/15 to 3/7/15.

The following table, compiled from weekly returns of increases in the numbers employed in the Government Factories and 12 private works, shows the increase during the quarter ending 3 July, 1915 (I. and R. Department, *Weekly Report*, II. (15/7/15), App. A).

Firm or Works.	Total No. employed.		Increase in 13 weeks.	
	April 3.	July 3.	No.	Per cent.
O.F., Woolwich	28,280	32,138	3,858	13·6
S.W.E. R.S.A.F...	6,008	6,756	748	12·5
,, R.G.P.F.	1,909	2,484	575	30·3
,, B.W.D.	196	315	119	59·5
Vickers, Barrow	3,650	6,243	2,593	72·0
,, Sheffield	3,935	4,520	585	15·0
,, Erith	6,112	7,251	1,139	18·7
,, Crayford	1,851	2,556	705	31·1
,, Dartford	702	788	86	12·3
,, E. & O.A.	1,193	3,991	2,798	233·2
, Wolseley Motors ..	2,612	3,184	572	22·0
Armstrong	25,531	32,697	7,166	28·1
Coventry Ordnance, Main Works	4,879	5,605	726	14·8
T. Firth	3,169	3,726	557	17·4
Greenwood & Batley	2,244	3,536	1,292	58·7
B.S.A.	7,046	7,786	740	10·5
TOTALS :				
Government Works ..	36,393	41,693	5,300	14·6
12 Private Works	62,924	81,883	18,959	30·1
COMBINED TOTAL	99,317	123,576	24,259	24·4

APPENDIX VI.

(CHAPTER I., p. 29.)

Demands for Labour at the Royal Factories and Armament Firms on the Preference List.

BOARD OF TRADE NATIONAL CLEARING HOUSE

1 *July*, 1915.

ERECTORS, FITTERS, AND TURNERS—		
General—Fitters	2,500	
Turners	2,000	
Marine Engine Fitters	150	
Millwrights	900	
Toolmakers	450	
Machine Tool Makers	500	
Tool Fitters	250	
Tool Turners	369	
Tool Setters	800	
Steam Engine Fitters	350	
Guns and Mountings Fitters	1,300	
Motor Fitters	50	
Motor Turners	50	
Marine Engine Turners	50	
Aeroplane Fitters	150	
Setters-Up	550	
COPPERSMITHS—		
Ship Work	100	
METAL MACHINISTS—		
Planers	300	*Highly Skilled Men only.*
Slotters	200	
Shapers	20	
Borers	220	
Millers, Universal	400	
Millers, Others	700	
Vertical Drillers	100	
Radial Drillers	70	
Other Drillers	300	
Grinders, Universal	50	
Capstan Hands	150	
Machinists	800	
SHEET METAL WORKERS—		
General	210	
TOTAL	14,030	

APPENDIX VII.

(CHAPTER II., p. 51.)

The Shells and Fuses Agreement, 5 March, 1915.

MEMO. OF SPECIAL CONFERENCE

BETWEEN

THE ENGINEERING EMPLOYERS' FEDERATION

AND

AMALGAMATED SOCIETY OF ENGINEERS
(Executive Council and District Delegates),
STEAM ENGINE MAKERS' SOCIETY,
UNITED MACHINE WORKERS' ASSOCIATION,
AMALGAMATED SOCIETY OF TOOLMAKERS, ETC.

Held within ROYAL VICTORIA STATION HOTEL, SHEFFIELD, on 5 March, 1915.

Production of Shells and Fuses.

The Government having represented that there is a present and continuously increasing need for shells and fuses for use by both Naval and Military services and that it is necessary for the existing production to be increased rapidly in order to meet the demand and that the numbers of men required for this purpose are not at present available :

IT IS MUTUALLY AGREED to recommend that the following provisions shall have effect during the War :—

1. Men engaged in the making of tools and gauges shall be skilled men. Men engaged in setting up machines shall be fully qualified for the operations they undertake.

2. Such men may be drawn from other Branches of the Engineering industry provided they possess the necessary qualifications and shall be paid, at least, the standard rate of the district, for the operation on which they are for the time engaged.

3. Lists of men employed in terms of the foregoing provisions shall be furnished to the Local Representatives of the Unions concerned.

4. Such men shall first be affected by any necessary discharges either during or after the period of the War.

5. Where skilled men are at present employed they shall in no case be displaced by less skilled labour unless other skilled employment is found for them in the same department.

6. Operations on which skilled men are at present employed, but which, by reason of their character, can be performed by semi-skilled or female labour, may be done by such labour during the War period.

Where semi-skilled or female labour is employed in place of skilled labour the rates paid shall be the usual rates of the districts obtaining for the operations performed.

7. The Federation undertakes that the fact of the restrictions being temporarily removed shall not be used to the ultimate prejudice of the workpeople or their Trade Unions.

8. Any Federated Employer shall at the conclusion of the War, unless the Government notify that the emergency continues, reinstate the working conditions of his factory on the pre-War basis, and as far as possible afford re-employment to his men who are at present serving with His Majesty's Forces.

9. These proposals shall not warrant any Employer making such arrangement in the shops as will effect a permanent restriction of employment of any trade in favour of semi-skilled men or female labour.

10. The Employers agree that they will not, after the War, take advantage of this Agreement to decrease wages, premium bonus times, or piecework prices (unless warranted by alteration in the means or method of manufacture), or break down established conditions, and will adopt such proposals only for the object of increasing output in the present extraordinary circumstances.

11. The Employers agree to take all possible steps to ensure distribution of Government work throughout the Kingdom.

12. So far as consistent with the National requirements regarding output, the Employers undertake to reduce overtime wherever possible, and in any event to distribute it over as large a number of workpeople as practicable.

13. In the event of semi-skilled or female labour being employed as per the foregoing clauses, they shall first be affected by any necessary discharges either before or after the War period.

14. The liberty of any employer to take advantage of these proposals shall be subject to acquiescence in all the provisions thereof, and to intimation of his acquiescence to the Local Representatives of the Unions through his local association.

APPENDIX VIII.

(CHAPTER III., p. 68.)

Lists of Chief War Office and Admiralty Contractors for Armaments, March, 1915.

WAR OFFICE LIST.

Armstrong, Whitworth & Co.
Vickers, Limited
Firth & Son
Hadfields, Limited
Projectile Company
W. Beardmore & Co.
Dick, Kerr & Co.
Cammell, Laird & Co.
King's Norton Metal Company
Coventry Ordnance Works
Birmingham Metal & Munitions Co.
Kynoch's, Limited
Birmingham Small Arms Co.
Greenwood & Batley
London Small Arms Co.
Eley Bros.
Nobel's Explosives Co.
Cotton Powder Co.
Curtiss & Harvey
New Explosives Co.
Chilworth Powder Co.
National Explosives Co.
British Explosives Syndicate

ADMIRALTY LIST.

Armstrong, Whitworth & Co.
W. Beardmore & Co.
J. Brown & Co.
Cammell, Laird & Co.
Denny & Brothers
Fairfield Shipbuilding & Engineering Co.
Hawthorn, Leslie & Co.
Palmer's Shipbuilding & Iron Co.
Parsons Marine Steam Turbine Co.
Scott's Shipbuilding Co.
Swan, Hunter & Wigham Richardson, Ltd.
Thornycroft & Co.
Vickers, Ltd.
White, J. S., & Co.
Wallsend Slipway Company
Yarrow & Co.

APPENDIX IX.

(CHAPTER IV., p. 96.)

War Office Circular to Contractors and Form of Employers' Undertaking.

WAR OFFICE,
LONDON, S.W.,

94/G. No./34. 29th March, 1915.

SIR,

I am commanded by the Army Council to send you the enclosed Memorandum of proposals relating to the acceleration of output on Government work during the war, drawn up at a conference between the Chancellor of the Exchequer, the President of the Board of Trade, and representatives of workmen's organisations.

You will observe that under Clause 5 of the memorandum due notice is to be given wherever practicable to the workmen concerned before any changes are introduced, and it is desirable that full opportunity should be given in each case for adequate consultation, either local or central, between employers and men.

You are requested to sign and return to this Department the enclosed copy of the form of Undertaking.

If you have sub-contracted with any firms for any work for this Department, you are requested to forward a copy of this Circular, and the Undertaking for signature to each firm to which, in your judgment, these documents apply. Further copies may be had on application to this Department.

I am, Sir,
Your obedient Servant,
R. H. BRADE.

94/Gen. No./34.

To His Majesty's Government.

In respect of any work on munitions or equipments of war, or other work required for the satisfactory completion of the war, now in our hands or hereafter placed with us, we undertake as follows :—

1. Any departure during the war from the practice ruling in our workshops, shipyards, and other industries prior to the war, shall only be for the period of the war.

2. No change in practice made during the war shall be allowed to prejudice the position of the workpeople in our employment, or of their trade unions in regard to the resumption and maintenance after the war of any rules or customs existing prior to the war.

3. In any readjustment of staff which may have to be effected after the war priority of employment will be given to workmen in our employment at the beginning of the war who are serving with the Colours or who are now in our employment.

4. Where the custom of a shop is changed during the war by the introduction of semi-skilled men to perform work hitherto performed by a class of workmen of higher skill, the rates paid shall be the usual rates of the district for that class of work.

5. The relaxation of existing demarcation restrictions or admission of semi-skilled or female labour shall not affect adversely the rates customarily paid for the job. In cases where men who ordinarily do the work are adversely affected thereby, the necessary readjustments shall be made so that they can maintain their previous earnings.

6. A record of the nature of the departure from the conditions prevailing before the date of this undertaking shall be kept and shall be open for inspection by the authorised representative of the Government.

7. Due notice shall be given to the workmen concerned wherever practicable of any changes of working conditions which it is desired to introduce as the result of this arrangement, and opportunity of local consultation with men or their representatives shall be given if desired.

8. All differences with our workmen engaged on Government work arising out of changes so introduced or with regard to wages or conditions of employment arising out of the war will be settled without stoppage of work in accordance with the following procedure :—

Subject to any existing agreements or methods now prevailing for the settlement of disputes, differences of a purely individual or local character shall unless mutually arranged be the subject of a deputation to the firm representing the workmen concerned, and differences of a general character affecting wages and conditions of employment arising out of the war shall be the subject of conferences between the parties.

In all cases of failure to reach a settlement of disputes by the parties directly concerned or their representatives, or under existing agreements, the matter in dispute shall be dealt with under any one of the three following alternatives as may be mutually agreed, or in default of agreement, settled by the Board of Trade :—

(*a*) The Committee on Production.
(*b*) A single arbitrator agreed upon by the parties or appointed by the Board of Trade.
(*c*) A court of arbitration upon which Labour is represented equally with the employers.

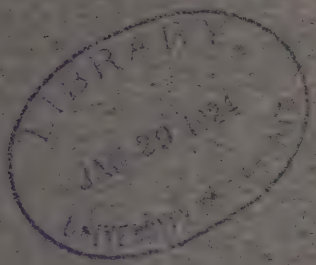
9. It is clearly understood that, except as provided under clause 3 of this undertaking, nothing in this undertaking is to prejudice the position of employers or employees after the war.

Signature.....

Date.....1915.

INDEX.

HISTORY OF THE MINISTRY OF MUNITIONS



VOLUME I

INDUSTRIAL MOBILISATION, 1914-15

PART III

THE ARMAMENTS OUTPUT COMMITTEE

Volume I

INDUSTRIAL MOBILISATION, 1914–15

PART III

THE ARMAMENTS OUTPUT COMMITTEE

CONTENTS.

CHAPTER I.

The Beginnings of Local Organisation.

CHAPTER II.

The Armaments Output Committee.

(474) Wt. 3643/A.P. 5036 10/18 250 D.St

CHAPTER II

Local Organisation, 31 March to 28 April.

CHAPTER IV.

Local Organisation, 28 April to 26 May.

CHAPTER V.

Central Organisation under Sir Percy Girouard and Mr. Booth, 28 April to 26 May.

APPENDICES.

CHAPTER I.

THE BEGINNINGS OF LOCAL ORGANISATION.

I. The Engineering Employers' Demand for Direct Contracts.

The preceding chapters have traced the outcome of the Board of Trade's activity along the lines of the programme laid down, in consultation with representatives of the Army Council, of the Royal Arsenal, and of the armament firms, on 30 December, 1914.

The scope of this campaign, in so far as it has yet been considered, had been entirely governed by the immediate aim of increasing the output of the recognised and established armament makers. The means to be taken were the reinforcement of these firms with fresh supplies of labour and the intensification of the productive power of labour already employed by obviating stoppage of work and securing the removal of Trade Union restrictions. At the outset, in fact, the sole object in view had been a great expansion of the system of munitions production which had prevailed before the War. The War Office Contracts department was still to deal, as it had always dealt, directly with a small group of well-known and expert manufacturers ; only, the scale of these dealings was to be immensely increased. The armament firms, in their turn, were to draw into the system fresh resources from the general engineering industry, by enlisting new sub-contractors, to whom they would pass on such work as, while their own new factories were building, they could not themselves absorb. And, at the same time, the Board of Trade was to call upon other employers to sacrifice their private contracts and to surrender some of their skilled staff to man those factories. Finally, when certain objections were raised to this part of the scheme, the Government took powers under the Defence of the Realm (Amendment) No. 2 Act, not merely to protect the willing employer from proceedings for breach of contract entailed by the disorganisation of his business, but to coerce the unwilling by taking away his men or his plant, or even by closing down his works altogether.

The principles of this December programme had been dictated by a previous decision, taken nearly three months earlier, on the general question, how best to bring the reserve forces of the engineering industry to bear on the production of armaments. Were the firms who came fresh to munitions work to be drawn into the old system, and either grouped, as sub-contractors, round the armament firms in which that system centred, or treated as a reservoir from which men and machines could be transferred to them ? Or were they, whether singly or in co-operative groups, to contract directly with the War

Office for stores of the simpler kinds that might be within their capacities, and so enter the field as independent competitors and set up what would be, in effect, new centres of armament work ?

The problem was put in this form in October, 1914, when the Cabinet mission to France reported on the French system of co-operative production, and the suggestion was made that it should be adopted in this country.[1] The opinion of the military authorities and of their expert advisers, the armament firms, was adverse to such a course. To judge this decision fairly, it is necessary to bear in mind that no one at that moment could possibly foresee either the length of the War or the enormous expansion of the military establishment. Until Lord Kitchener, on 4 December, in one of the very few interviews he granted to the Press, spoke of the possibility that the War would last for three years, it may be doubted whether more than a very few of the men recruited in the previous four months had taken seriously the terms of their enlistment : " Three years or the duration of the War." The new armies were being enrolled by a hundred thousand men at a time ; but the total numbers that were ultimately to be reached by voluntary enlistment were beyond the purview of the most prudent calculation. In October, the need for a large increase in the daily allowance of gun ammunition had only just become apparent. In these circumstances, the task of supplying the Expeditionary Force, and of equipping the new units with munitions, did not appear likely to exceed the powers of the regular contractors, provided they could be reinforced by subsidised extensions of their works and by a wide expansion of sub-contracting. The first duty of the military authorities was to develop production on lines that should secure the greatest possible rapidity and efficiency. They naturally looked to the expert firms, who understood every detail of manufacture, were accustomed to work up to the severe limits of the inspection tests prescribed for safety, and alone could provide fully qualified supervision and management.

The decision reached on these grounds was momentous : it governed the general trend of War Office policy until the end of March, 1915. Some time necessarily passed before it was possible to form any estimate of the prospects of success. The schemes of expansion could not be carried out in a week or a month. The new buildings at the armament works had to be erected ; the new machinery to be purchased ; the new labour to be recruited ; and the new sub-contractors to be put in the way of unfamiliar work. When it was discovered in December that the deliveries of gun ammunition promised by the main contractors were not coming forward, it was not inferred that the scheme in itself was in fault. The contractors' estimates had been too sanguine ; the sub-contractors had broken down over unforeseen difficulties. This failure might be taken as pointing to the fundamental soundness of the position that the technical difficulties of armament work were likely to defeat the inexpert manufacturer, and that the War Office should put its faith

[1] See Part I. Details of the French system will be given below, p. 10 and Appendix IV.

more than ever in the established makers. Accordingly, when the help of the Board of Trade was invoked in the last days of 1914, the focus of its programme was entirely on the armament firms. Its efforts were all to be directed to the interests of the October policy, which the War Office saw no reason to abandon.

On the other hand, one of the proposed methods of remedying the shortage of skilled labour depended for its success on the attitude of the ordinary engineering employer. If the necessity had not arisen for the Labour Exchange organisation to go beyond its normal functions and attempt to persuade employers to surrender their skilled men to the armament firms, the voice of the outside manufacturer might have remained unheard. He had not been consulted in October on the general question that has been stated above, though it was a question which concerned him nearly, and to which he might be expected to return an answer different from that of the armament firms who advised the War Office. Now, however, when the Board of Trade officials came to him on their mission in the first weeks of 1915, it was soon brought home to them that a scheme which involved disorganising his establishment and depleting it of skilled men for the equipment and expansion of other private factories, would not be accepted without examination or demur The most important result of the canvass was, not the somewhat meagre numbers of men released for transfer, but the opportunity it gave to the employer of claiming, as an alternative, that he should be allowed to tender for direct armament contracts.

This suggestion occurs, as early as 7 January, in a preliminary report to the Board of Trade from the Divisional Officer of the N.W. Division. Enquiries in his district had shown that a very large number of textile engineers were making shell cases, and other firms were sub-contracting for machinery needed for Government work. Apart from this reason against parting with their men, the employers objected to surrendering them to private firms like Armstrong's and Vickers. The writer suggested that some engineering works, for instance in Manchester, should be allowed to contract for some preparatory processes that were then done by the armament firms. Otherwise they would refuse to release their men

In London, where visits to 2,619 firms had yielded by 23 January no more than 225 men for transfer, seven firms offered to take armament work.

In South Wales, again, a deputation of the Welsh Engineers and Founders' Association, received at Cardiff on 13 January, explained that the five firms they represented were already engaged on sub-contracts for metal work and ship-repairing for the Government, and were also doing work on which other sub-contractors depended. They had lost men through enlistment and the attraction of higher wages offered elsewhere. In order to keep the men still left to them and avoid closing down, they asked for an opportunity of taking Government contracts themselves, arguing that their men would be bette

off, even on lower wages, if they were not transferred to a distance from their homes.

These are only a few instances out of many. Such claims were supported by the strong argument that the ramifications of sub-contracting were so intricate as to make it hardly possible to pick out men from any given engineering establishment without dislocating work that was connected, at however many removes, with some contract for Government. Behind the employers' opposition, moreover, lay a lively jealousy of the armament firms, who were generally believed to squeeze their sub-contractors, and had already, by the high wages which their large profits enabled them to offer, robbed the outside engineering industry of many of its skilled men. The employer who had suffered in either of these ways was not too ready to part with more of his hands to swell still further the dividends of private companies.

The Board of Trade was impressed by these considerations. Sir H. Llewellyn Smith, reviewing the results of the canvass of employers in the first fortnight of January, wrote[1] :—

> " The effort to divert labour from ordinary engineering work to armament work by persuading employers voluntarily to release workmen to be transferred to armament firms has been much less productive " (than the measures taken to recruit unemployed labour), " and it is feared that not much more can be expected under this head.
>
> " The difficulties encountered are many. A very large number of engineering firms are doing sub-contracting work for armament firms or are making machinery for armament work ; many others think that they ought to have Government contracts or sub-contracts, and express a strong preference for spreading the work as a mode of increasing the amount of labour employed for armament purposes, as compared with the diversion of their work-people to earn high profits for Armstrong or Vickers. . . .
>
> " I have therefore been led to the conclusion that, if a large amount of labour in addition to what can be obtained from among the unemployed British and Belgian workpeople is required for armament purposes, it is necessary in the first place to ascertain precisely how much additional work can be devolved on other engineering firms by the armament firms, or given to them direct, and to distribute this work judiciously so as to take advantage to the fullest extent of the plant and labour available.
>
> " While there are obvious limitations to the extent to which this method can be applied, it is evident that, so far as it is found practicable to adopt it, it presents many economic advantages over the alternative method of transferring the workmen, both because it makes additional premises and plant, as well as

[1] *Supply of Armament Labour, Preliminary Note* (23/1/15). HIST. REC. R/180/8.

additional labour, available for Government purposes, and because it does not give rise to the housing and other difficulties which have already been encountered in the case of the transference of labour to Barrow."

Thus, in the reaction of the employers against the diversion of their labour to armament firms, emerged the demand for the opposite policy of spreading direct munitions contracts over a wider field. Through stages which will be traced in the following chapters, the movement led to results of the greatest importance. Alongside of the established system of armament production, which went on as before, independent local organisations were formed by the enthusiasm and enterprise of smaller engineering firms all over the country. First came the Co-operative Group; later, the National Factory. At the end of March, Mr. Booth's Committee, appointed by Lord Kitchener, took up the central direction of this work, and itself developed, in the course of the following three months, into the Ministry of Munitions.

If the original impetus came from the employers, the merit of seeing the possibilities of the movement, of encouraging it, and of preparing the way for its progress in the first quarter of 1915, belongs solely to the Board of Trade. During those months all the active sympathy and support which the employers received from the Government came from this Department, working through the Labour Exchange organisation and through such influence as it was able to exercise upon the War Office. In the history of the War, this action will rank high among the services which the Board of Trade has rendered to the country.

II. Survey of Engineering Firms Proposed by the Board of Trade.

After no more than a fortnight's experience, it would have been imprudent to abandon the campaign for the diversion of labour and to adopt exclusively the alternative policy of spreading contracts, even if the War Office could have been induced to change its attitude. Divergent as the two methods were, the Board of Trade wisely pursued both concurrently. The measures taken to facilitate the transfer of labour have already been reviewed.[1] Such obstacles as legislation could remove were dealt with by the Defence of the Realm (Amendment) No. 2 Act. In the other direction, the Department at once set to work to discover what actual resources could be turned to account on the lines of the employers' demand. This promptitude saved three months which would otherwise, for these purposes, have been lost.

Any such action, of course, required the concurrence of the Master-General of the Ordnance. It happened that a suitable mode of procedure was already in working order. Co-operation had been established between the Army Contracts department and the Board of Trade as early as September, 1914. It had arisen out of the duty of the Board to maintain employment so far as possible during the War; but, owing to the serious shortage of supplies occurring in several classes

[1] Part II., Chap. I.

of stores (other than destructive munitions), the Board had also been asked to undertake the discovery of new firms capable of making the articles required, and the inspection of such firms in order to ascertain their status and capacity before they were included in the War Office lists.[1] What was now required was an extension of this system to firms which might offer to undertake armament work.

On 9 January, two representatives of the Board of Trade interviewed the Master-General of the Ordnance, and suggested that firms should be informed through the Labour Exchange organisation that requests on their part for contracts which they could undertake would be considered by the War Office. The Master-General of the Ordnance gave his sanction, and it was agreed that instructions in this sense should be issued to Divisional Officers, after reference to him.[2]

Action was immediately taken on this agreement. On 12 January, a letter was sent to the N.W. Divisional Officer, who was to hold a meeting of engineering employers at Manchester on the following day. This letter (which was sanctioned by the Master-General of the Ordnance) stated that the War Office could not, of course, promise contracts until they knew the capabilities of the firms. Some work was of too technical a character, and for this work men must be obtained for the armament firms and the Arsenal. If, however, employers would release their men generously, the War Office would consider requests for direct contracts or sub-contracts. It was left to the employers to tender. The Government would probably not subsidise firms to enable them to manufacture new commodities. If they wished to tender, they would have to provide the machinery.[3]

On 14 January, Mr. Rey, Mr. Wolff, and Mr. Davison of the Board of Trade agreed in recommending that the Board should undertake a survey of the engineering trade.[4] It was proposed that the War Office should furnish a brief description of stores which were needed and which could be made by inexperienced firms. With this description managers of Labour Exchanges could call on firms in their districts with a form of report containing two questions : (*a*) whether the firm was now, directly or indirectly, engaged on Government work ; and (*b*) whether it was prepared to do such work or to increase the amount it was already doing. The names of firms who replied "Yes" to question (*b*) would then be sent to the War Office, which could examine their capabilities and pass on the names of any that proved suitable to the armament firms with a view to sub-contracts. From firms which answered "No," the Board of Trade would then be free to take men (if they had the necessary powers) with or without the employers' consent. The proposed survey would thus prepare the way both for spreading contracts and for transferring men compulsorily, if they could be authorised to do so.

This plan was submitted by a representative of the Board to the Master-General of the Ordnance and the Director of Army Contracts

---

[1] About 11,000 firms were inspected through the Labour Exchange organisation in the first 18 months of the War.

[2] L.E. 1965/15. [3] L.E. 1965/40. [4] L.E. 1965/30.

at an interview on 18 January. A series of questions to be put to likely firms was drawn up. In view of the great variety and complication of specifications, it was considered that the best way to estimate the capacity of a firm was to obtain information as to its machinery. The War Office, accordingly, was to furnish a list (A) of the machines, gauges, etc., that would be required for the manufacture of the stores. They were also to provide a list (B) of articles that could be made in ordinary engineering works. These arrangements were confirmed on the following day by the Master-General of the Ordnance' Committee on Armaments, and Messrs. Vickers, who were represented on that Committee, were requested to prepare the list of machinery.[1] The questionnaire, drawn up by Mr. Beveridge for the inspectors' report, was printed.[2] A third list (C) of classes of labour was prepared, to accompany the questionnaire. The inspector was to report what numbers of men of each class were employed by the firm, and to what extent they were engaged on private work.

The Board of Trade had completed its arrangements for the survey by 26 January. The actual work, however, could not be put in hand until the lists of articles and of machines were received from the War Office. This occasioned a delay of some weeks.

Meanwhile, on 26 January, Mr. Beveridge wrote on this subject to the Secretary of the Engineering Employers' Federation, who asked that, as regards the federated firms, the Federation should be allowed to send out the enquiry. A circular was accordingly drawn up, which stated that the enquiry was directed to the discovery of—

> " (1) Any additional firms whose machinery is suitable for the manufacture of certain armaments or parts of them ;
>
> " (2) Any firms already engaged on work of this character, but capable of undertaking further orders, if all their private work could be set aside ;
>
> " (3) The number of workpeople belonging to the classes set out in List C but not at present engaged on Government work."

The circular continued :—

> " It must be understood that this enquiry in no way indicates that your firm will receive a Government contract or sub-contract, or even an opportunity of tendering for specific articles. It must be regarded as a preliminary to any further enquiries by the Board of Trade which may be necessary in order to ascertain the capacity of your firm for work connected with armaments in the event of the possible future needs of the Government "

When the draft circular was submitted to the Federation for approval, they took objection to the absence of any specific informa-

[1] L.E. 1965/49. It was also decided to compile a list of War Office contractors and sub-contractors, to the third degree. The Board of Trade representatives, however, thought it would be impossible to make a comprehensive list and that other measures for surveying industry would make such a list superfluous.

[2] See Appendix I. Owing to the change of plan described below, this form was never issued.

tion as to the types of contract that might be offered by the War Office. They declined to issue the circular, and the matter dropped.[1]

Owing to the adoption of another method presently to be described, the original plan of the Board of Trade was not carried out. It was arranged instead that the Home Office should undertake a Census of Machinery.[2] This was conducted in March by the Factory Inspectors, and took some three weeks. The results were communicated to the War Office in reports, the form of which is given in Appendix II.

III. Exhibitions of Samples at Labour Exchanges.

While the Board of Trade was waiting for the War Office to supply the lists of articles and machines required for the survey, another method of approaching the engineering firms was suggested on 29 January by the Divisional Officer of the N.W. Division. He proposed that sample articles should be exhibited in important centres, such as Manchester, Sheffield, Glasgow, and Birmingham. Employers should be invited to inspect them and to tender for any articles they thought they could make, stating a price, the quantity they could offer, and the time of delivery.

By a coincidence, a similar plan had just been adopted independently by the War Office.[3] As a consequence of the canvass of employers early in January, the Master-General of the Ordnance Contracts Branch had begun to receive offers from firms who described the machinery they possessed and asked for specifications and drawings of any work that could be done on their machines. On 26 January, it was agreed between the Director of Artillery and Mr. Hanson that the best procedure would be that representatives of such firms should see specimens of ammunition in the Inspection Department at Woolwich, and that then, if they considered themselves able to manufacture any particular type, their works and plant should be inspected. The Chief Inspector, Woolwich, reported that he could arrange for the visits to Woolwich, but could not provide a staff to undertake the inspection. It was, accordingly, decided on 18 February that Major-General Mahon, of the Master-General of the Ordnance staff, should be responsible for the inspection, and this procedure continued in being till May.

These arrangements appear to have been initiated without consulting the Board of Trade. The Board, however, took up their Divisional Officer's suggestion, as providing a better method of testing the possibilities than their original plans for the survey.

On 9 February, Mr. Davison interviewed Major-General Mahon, who welcomed the proposal that samples should be displayed in Liverpool, Manchester, Glasgow, Leeds, Coventry, Sheffield, Birmingham

[1] L.E. 1965/62A.

[2] In pursuance of the following conclusion of a Conference of Ministers held on 5 March, 1915: "The Home Office to obtain information as to the number of machines at present available for the production of various kinds of war material, the number lying idle, and the present rate of production compared with the maximum." HIST. REC./R/170/22.

[3] See 94/GEN. No./17.

and London. He agreed that, except in the case of Liverpool,[1] the local arrangements should be made by the Divisional Officers. He also agreed that the Board of Trade officials, guided by the list of machines which had been now supplied by Messrs. Vickers, should inspect all suitable firms and report to the War Office. It was to be made clear to the firms that they were to judge their capacity for armament work only on the basis of their existing plant and labour. Major-General Mahon undertook to edit the list of machines, and to obtain from the armament firms information as to the articles of which they stood most in need at any time, so as to be able to put any suitable firms discovered by the Board of Trade into communication with the main contractors.[2]

Preliminary instructions were issued on 24 February by the Board of Trade in a circular to Divisional Officers,[3] the terms of which were agreed with Major-General Mahon. As soon as these officers should be informed that all the samples were ready for exhibition, they were to issue to employers in their Division a letter (a copy of which was enclosed) inviting them to examine the samples and accompanying specifications. Firms who thought they could undertake any of the work were to inform the Divisional Officer what stage or stages of work they contemplated, and state the number and class of machines they had at their disposal. The circular also enclosed two memoranda, drawn up by Major-General Mahon, on plant required for the manufacture of (1) Steel Shells, (2) Simple Fuses. These were for the guidance of the Board of Trade officials, who were to inspect the works of such firms as should offer to tender. The inspectors' reports were to be made for the War Office on the form given in Appendix III.

When the samples had been obtained, the exhibitions were opened on 10 March by the Labour Exchanges in London, Birmingham, Coventry, Leeds, Sheffield, Manchester, Liverpool, Newcastle and Glasgow. A very large number of invitations were issued, and the response was good. The articles exhibited were—(1) *Shells*: 13-pdr., 15-pdr., 18-pdr., 4·5-inch; (2) *Fuses*: No. 100.

A general review of the results obtained in the first fortnight during which the exhibitions were open was given in a report by Mr. Davison on 25 March.

(*a*) A certain number of firms had been discovered who were completely unable to assist in the manufacture of shells, although they might be employing classes of labour which were urgently required by the armament firms. It was suggested that it should now be possible to attempt to persuade these firms to release a certain proportion of this labour.

(*b*) A considerable number of firms were unable to undertake the manufacture of shells, but willing to assist in making other articles required by the War Office. Their offers were reported to the War Office.

---

[1] At Liverpool, Major-General Mahon specially suggested that the samples should be exhibited at Mr. E. C. Given's, the Civic Service League, 17, Water Stree .

[2] Note by Mr. Davison (9/2/15). HIST. REC./R/170/17.

[3] C.O. Circ. 1741 (L.E. 1965/59).

(*c*) In all parts of the country firms were found who were willing and anxious to make shells or parts of them. Some of these firms had, after seeing the samples, put themselves into direct communication with the armament firms, with the result that sub-contracts for machining work or other processes were placed with them. Cases of this character were reported from Yorkshire.

(*d*) A small number of firms offered to undertake the manufacture of the complete shell. Reports on these firms were submitted to the War Office.[1]

By May the Board of Trade Survey had covered over 300 firms. It was believed that, while it included a considerable number of shops which, upon inspection, proved useless, it probably took in nearly every firm not already engaged in shell-making, which could without much difficulty be wholly or partially converted to the purpose.[2]

IV. The Co-operative Group for Munitions Manufacture.

What proved to be by far the most important outcome of these activities was the formation of co-operative groups of manufacturers for munitions production. This type of local organisation provided scope for those firms which were not equipped for making complete stores, but at the same time wished to work independently rather than as sub-contractors to the armament firms.

The plan of grouping together small firms which were separately incapable of undertaking a contract for complete articles was not novel. Under the auspices of the Board of Trade, it had been adopted in the autumn of 1914 in the case of certain Army stores other than destructive munitions, and first of all in the saddlery trade. At suitable centres representatives of firms were invited to meetings at which a Board of Trade officer gave information and exhibited samples. Committees were elected to organise the groups, to undertake contracts on their behalf, to purchase and distribute materials, and to collect the weekly output. In the saddlery trade ten such groups were formed.

It has already been mentioned that the application of this system to armament work had been considered in October, 1914, when the Cabinet mission reported on the French organisation.[3] The following is a summary of the information supplied to the British representatives at Paris by General Deville.

Soon after the outbreak of the War,[4] when M. Millerand was Minister of War, the Government had divided France into districts and had conferred with the heads of private engineering establishments (*maîtres de forges*) in each district. They had put selected employers at the head of each group for the purpose of directing engineering

[1] Mr. Davison's report also mentioned the formation of a Co-operative Group at Leicester, which will be described below. L.E. 1965/113A. HIST. REC./R/170/18.

[2] M.C. 428.

[3] See Part I.

[4] The meetings at which these arrangements were made actually took place at Bordeaux on 30 September and 7 and 8 October (*Report to the Senate of the Commission on Purchases*, No. 284, 1916, p. 8).

energy and plant into the most necessary channels. By this means many private works, which in peace time were producing other things, *e.g.*, automobiles, were now producing ammunition. There had been great difficulty in getting enough skilled workmen, since, when the War began, mechanics specially skilled in the manufacture of munitions had been called up along with the rest; but they had recalled many of those skilled men. As a result of this policy, munitions were now (October) being turned out by some private firms, and the production would rapidly increase.

General Deville thought that private enterprise might be similarly used for the manufacture of artillery, though some parts of a gun required such delicate adjustment that only a specially trained man could make them. Other parts could be made in private engineering works. If we began now (October) he thought we ought to begin to turn out guns by April, 1915, and the production, once begun, should increase. He said, further, that England had such an immense number of splendidly equipped engineering works, with every variety of machines, plant, and tools, that our situation was, for purposes of rapidly increasing supplies, better than that of France.[1]

As has already been stated, the project of adopting the system in this country was opposed by the expert advisers of the War Office It accordingly remained in abeyance until the end of 1914, when the failure of the chief contractors to redeem their promises again brought to the front the need for further measures to increase output.

Early in January, 1915, the suggestion was revived by Mr. Dumas, the works manager of the British Thomson-Houston Company at Rugby. When the French organisation was first set on foot, Mr. Dumas had assisted a representative of the French branch of his Company in getting together machine tools for the manufacture of the 75 mm. shell. As he now took an active part in promoting at Leicester the first group formed in England for co-operative shell manufacture, through this personal link the system in this country is directly affiliated to the French model.

V. The Formation at Leicester of the First Co-operative Group.

The movement at Leicester dates from 8 January, 1915, when Mr. P. Handley, manager of the local Labour Exchange, attended a meeting of the Leicester Association of Engineering Employers in

[1] The above summary is based on an extract from Lord Reading's Diary and the Attorney-General's Note on the visit to France, which were read to the Munitions of War Committee by Mr. Lloyd George at the first meeting on 12 April, 1915 (M.C.1). A memorandum (dated 15 June, 1915), on the Organisation in France for the Production of Munitions, gives the following additional details. The original number of groups was 9; by 15 June, 1915, it had been increased to 15. In most cases the Directors of the groups took charge of the total orders allotted to the locality and divided them amongst sub-contractors. Paris was treated differently, individual contracts being placed with large automobile and engineering firms. Of these, 140 contracted for shell, 240 for gaines.

The Government sent a mission to France in April, 1915, to investigate the French system and its results. A summary of the report by Mr. E. W. Moir is given in Appendix IV.

order to put before them the fresh demand for 30,000 skilled men to be drafted to the armament firms.[1]

Mr. Handley was met by the objection that representatives of armament firms had been in the district as recently as the day before, calling upon engineering employers, making notes of their plant, and inviting them to accept sub-contracts. Many of the firms represented at the meeting had already received large contracts for munitions, and had successfully manufactured and delivered the articles. Among other armament firms who in this way had passed on orders to Leicester, Messrs. Armstrong, Messrs. Vickers, and Coventry Ordnance were mentioned.

Every one of the members present at the meeting had machinery standing idle and was in urgent need of more men to deal with work in hand, the bulk of which was manufacture of boot and hosiery machinery, needle-making machines, and motors, etc., for the Government. It was, in fact, estimated that the engineers of the district were engaged from 80 per cent. to 90 per cent. of their time on manufacture urgently needed for war purposes.

In the course of the discussion, Mr. Dumas described his connection with the French organisation, and pointed out that a group of manufacturers in Paris were at that moment producing large numbers of shell for the French Government. His own company were making shells at their Willesden factory for one of the armament firms, and were preparing to make 4·7-in. shell for the Admiralty at Rugby.

Other speakers also argued that it would be wasteful to remove men and leave the plant idle, while the men would be working under new conditions and on strange machines. The firms could, by readjustment, working overtime, and so on, get some additional volume of work out of their existing staff. It was considered that the best policy would be to distribute the manufacture of Government stores as widely as possible, both from the point of view of safety from raid, and also because men working in familiar surroundings would give a larger and better output.

The meeting passed the following resolution :—

> " That the members of this Association, having heard and discussed the request for men by Mr. P. Handley (Board of Trade) for munition purposes, are of opinion that, rather than more men should be taken from this district to work for firms doing Government work, the Government would receive greater benefit by utilising to its fullest extent the facilities already existing in the district, to the extent, if necessary, of arranging for men who have left the district to join His Majesty's forces to return to the engineering works where they were formerly employed."

---

[1] Mr. Handley's Report. L.E. 1965/76.

On 3 February, Mr. Handley reported further[1] that the Association had sent its President and Secretary to offer its services in any way in which it could be useful, such as advising what classes of work could be undertaken in the district, arranging the distribution of orders, or endeavouring "to organise some scheme whereby the efforts of individual firms could be combined and co-ordinated so as to produce the most satisfactory results." Many members were confident of their ability to undertake almost any class of engineering work. It was anticipated that one of the greatest difficulties would be the inspection of parts at different stages of manufacture; but it was felt that, in so wide an area as this, inspection could be arranged for, if the Government would fully explain its requirements. The local Association considered that, as a body, they could accept such large contracts as to make it worth while for the War Office to treat with them separately; while action through the general Federation would entail delay. They proposed that the War Office and Admiralty should send a representative to come to some definite understanding with them. Mr. Handley endorsed this proposal and urged that the Board of Trade should make strong representations to the Departments concerned.

The Divisional Officer, in forwarding this report, remarked that as he understood, Messrs. Vickers' action in going to Leicester to recruit men had "set the local employers ablaze."

The expedient of creating groups for shell-making was also definitely put forward by Mr. Passmore, the Divisional Officer for the Yorkshire and East Midlands Division, in a letter to Mr. Davison on 1 March. Referring to the arrangements then being made for the exhibition of samples and subsequent inspection of firms, Mr. Passmore wrote:— "I gather from information I have received from some managers in engineering centres that many of the small firms will certainly not possess the necessary hydraulic presses. I would, therefore, suggest that some arrangement similar to the grouping arrangement for saddlery might be considered. It would be necessary, of course, for each group to contain at least one firm possessing the necessary powerful hydraulic press. The difficulty would probably arise with the smaller firms in regard to the light hydraulic press (for 'nosing' the shell body). From what managers in engineering centres tell me, some sort of grouping arrangement will probably be necessary in order to secure the maximum output from the smaller firms."

Mr. Davison replied on 2 March that Major-General Mahon, whom he had consulted on this proposal, saw no objection to the principles involved in such groupings.[2]

On 5 March, Mr. Passmore conferred with four managers of Exchanges in large engineering centres. It was agreed by those present that the whole division did not contain more than six or seven firms possessing the powerful hydraulic presses needed for making shell bodies. If it should be found that these firms were not fully

[1] L.E. 1965/76. [2] L.E. 1965/100.

occupied on Government work, Mr. Passmore suggested that the War Office should give them separate direct contracts for shell bodies. The War Office would thus control the supply of rough shell, which they could then distribute to the smaller firms. These should be organised to do the subsequent processes in groups, each containing one firm with light hydraulic presses.

Mr. Davison informed Mr. Passmore on 10 March that he did not personally think it likely that the War Office would be willing to place one set of contracts with large firms capable of forging shells, and another set of contracts with a sufficient number of small firms for the finishing operations. His own impression was that an attempt should be made to arrange groups which could tender to the War Office for the complete article. The question, however, could be considered later, when offers came in as a result of the exhibitions of samples.

These exhibitions, coinciding with the passing of the Defence of the Realm (Amendment) No. 2 Act in March, gave a fresh impetus to the movement.

At Leicester, the scheme was definitely set on foot at a meeting of engineering employers summoned for 23 March by the Leicester Association of Engineering Employers, acting in co-operation with the local Board of Trade officials. The Central Office of Labour Exchanges was represented by Mr. Davison. The chair was taken by Mr. J. A. Keay, then President of the Association. To his efforts, coupled with those of Mr. Dumas and Mr. Handley, and energetically supported by Mr. Booth, who was then just taking up his new work at the War Office, the successful inauguration of the scheme was chiefly due. As will be seen later, the Master-General of the Ordnance department was at this moment inclined to go back upon the sanction it had given to the principle of co-operative schemes and to revert to the older policy of using the inexperienced firms only as sub-contractors. Mr. Booth, however, procured that Major-General Mahon, who was then engaged in a propaganda for the transfer of skilled men to armament firms, should be present at the meeting. Representatives of some ninety-four firms attended.

Mr. Handley suggested the formation of a group, though he explained that the Board of Trade had not been consulted as to this proposal. He submitted a scheme of co-operation which would embrace every process in the manufacture of certain types of shell, and proposed the election of a Board of Control.

Major-General Mahon said that the War Office intended to support in every way the existing armament firms and other firms which were producing, or could produce, shells. At the same time, the War Office would try to utilise any further manufacturing power that could be found. If the Leicester firms formed a group, they would have to rely on themselves for labour and materials, and for supervision, which, he thought, could not be provided from Woolwich or elsewhere. He thought the War Office would not refuse a small output, provided that no existing plant, material, or men were interfered with. The War Office would appoint an inspector.

The meeting anticipated no difficulty with regard to raw material. Forgings could be produced locally, and little extra plant was needed. It was estimated that about 500 shells, rising to 1,000, could be produced weekly. It was resolved to proceed with the scheme.

A deputation from the new group submitted their proposals to the War Office on 30 March and received their first order for a weekly output of 1,000 4·5-inch shell.

The further developments of the undertaking belong to another chapter in this History. Here it may be noted that the co-operative schemes later set on foot at Hull, Bradford, Leeds, and other northern towns were influenced by the Leicester model. Representatives from these places came to Leicester, and either attended meetings of the Board of Control or were furnished with information.

VI. Change of Policy at the War Office.

The type of local organisation which was first brought into being at Leicester provided a channel for much enthusiasm and energy, which, if this outlet had been denied, would have been chilled and discouraged. The movement was by no means confined to Leicester. After the exhibitions of samples and the passing of the Defence of the Realm (Amendment) No. 2 Act, offers of personal services or of buildings and plant flowed in to the War Office or to the Chancellor of the Exchequer from manufacturers, all over the country, who were eager to take their part.

At this critical moment, on the eve of the decisive meeting at Leicester on 23 March, the Board of Trade suddenly discovered that the attitude of the War Office towards the whole policy had become unsympathetic and even hostile. As the foregoing pages have shown, the original arrangements for the survey and exhibitions had been made in collaboration with Major-General Mahon, whom the Master-General of the Ordnance had designated as the proper authority to sanction the Board's proposals. But on 18 March, when the arrangements for the Leicester meeting were in train, and a representative of the Board requested the War Office to send an expert to attend it, an unexpected check was encountered. Mr. Davison reported his interview with the Director of Artillery as follows[1] :—

> "General Guthrie Smith, Director of Artillery, stated that he was unwilling to send any representatives to Leicester or to any other place where negotiations might be on foot. His reason for this attitude was that it had recently been decided to place no additional orders with any firms for the manufacture of shells until the complete labour requirements of the main armament factories had been met.
>
> "It was explained that the War Office had originally arranged for this exhibition in order to discover firms which might be suitable to undertake orders. In answer to this, General Guthrie Smith admitted that there had been a recent

[1] Memorandum by Mr. Davison (19 March, 1915). L.E. 1965/113A.

change of policy in this respect. The armament firms had undertaken contracts very largely in excess of what they could fulfil. The Government had purchased for them large increases of plant, and it was not intended to place any further orders until labour requirements had been met.

"It was pointed out that the refusal to place any further orders would not necessarily secure transfer of labour to the armament factories, and that a large amount of productive capacity would thereby be wasted. General Guthrie Smith then stated that, if suitable firms were found and no orders were available for them, it would be possible for the Government to close the works and remove the labour to other districts.

"It is suggested," Mr. Davison continued, "that such a result could hardly be justified in view of the manner in which employers have been approached by the Board of Trade in this matter. It would, moreover, differentiate unfairly between those firms which had showed themselves capable of undertaking orders and other firms which, though not possessing the necessary plant, might still possess the classes of labour required.

"It seems to be necessary at this stage to request the War Office to make no final decision as to the placing of further orders with non-armament firms. If they are unable to place fresh orders, it should still be possible to transfer some of their unfulfilled orders from the main armament firms to any other groups of firms or individual firms who may be able to undertake the manufacture. It also seems to be very desirable that some representative of the War Office should attend the Leicester meeting.

"It should be added that Major-General Mahon has asked the main armament firms to communicate to him the stages of work on shells which they are now in a position to sub-let to non-armament firms which may be found to be suitable as a result of our survey. Experience indicates that such sub-contracts will not easily be arranged with the main contractors without strong action on the part of the War Office. General Guthrie Smith's attitude in this aspect of the case was that he would not be opposed to sub-contracts, but that the transfer of labour to the armament firms was paramount."

The above report was forwarded to the President of the Board of Trade with a strongly worded minute by Sir H. Llewellyn Smith, pointing out that the action of the War Office was "calculated to embarrass us in fulfilling the Cabinet mandate as to armament workers." The President wrote:—"We cannot stop this now, even if we cannot command their expert to go down."

Mr. Davison wrote to Mr. Scott at the Northampton Labour Exchange that he was hoping to attend the Leicester meeting, but

that the attitude of the War Office was far from encouraging. "They are now inclined to change their policy and revert to the original idea of removing labour from engineering firms to the main armament contractors. This would, of course, be a very unfortunate consequence of the exhibition of samples which was arranged at the War Office's request, but it shows we must be very careful to give employers no undue encouragement. The War Office are not opposed to sub-contracts being arranged with the main armament firms, but here the difficulty lies in the reluctance of the main armament firms to deal with other manufacturers."[1]

At this moment it seemed as if all chances of further progress were endangered. To promote schemes for spreading armament contracts did not properly fall within the functions of the Labour Exchange organisation. To persist in face of opposition from the Department primarily concerned would have been impossible. Nor was the Central Office of the Labour Exchanges in a position to co-ordinate and direct the efforts of local groups of manufacturers in work of a type which could not be done without a large amount of technical information and assistance.

Much of the ground that had been won by the Board of Trade might now have been lost, had not the direction of the movement been taken in hand with freshness and energy by a new body, which was not only capable of regarding its possibilities with a sympathetic outlook, but at the same time had an official footing inside the War Office. The situation was saved by Mr. Booth and the Armaments Output Committee. It was Mr. Booth who secured the attendance of Major-General Mahon at the Leicester meeting, and carried the negotiations for the first contract with the new group to a successful conclusion.

---

[1] L.E. 1965/110A.

CHAPTER II.

THE ARMAMENTS OUTPUT COMMITTEE.

I. Appointment of the Armaments Output Committee.

The Armaments Output Committee was appointed by Lord Kitchener on 31 March, 1915. The official announcement, which appeared in the Press on 7 April, was as follows :—

> "The Secretary to the War Office announces that Lord Kitchener has appointed a Committee to take the necessary steps to provide such additional labour as may be required to secure that the supply of munitions of war shall be sufficient to meet all requirements.
>
> "Communications in regard to this subject should be addressed to
>
> GEORGE M. BOOTH, Esq.,
> War Office, S.W."

The names of the members of the Committee were communicated to the House of Commons on 20 April[1] :

> Field-Marshal the Earl Kitchener, Secretary of State for War.
>
> Major-General Sir Stanley B. von Donop, M.G.O.
>
> Sir Herbert A. Walker, Chairman of the Railway Executive Committee.
>
> Sir Algernon Firth, President of the Associated Chambers of Commerce.
>
> George M. Booth, Esq.
>
> Allan M. Smith, Esq., Secretary of the Engineering Employers' Federation.

The appointment of this Committee marks the beginning of a central organisation which, in the course of the next two months, was to develop into the nucleus of a Department of State, and finally to be detached from the War Office. The astonishing rapidity of this development, the energy with which the Committee took up, from week to week, and almost from day to day, one new aspect after another of the whole problem of munitions supply, have obscured the fact that the original conception of its scope and functions was, in comparison, extremely narrow. Even at the time, interested persons who had followed the debates on the Defence of the Realm (Amendment) No. 2 Act, or were cognisant of the propaganda carried on by the Board of

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXI., 207.

Trade through the sample exhibitions, read with a shock of surprise on 7 April that a Committee was appointed, not to organise the reserve capacity of the Engineering industry, but " to provide such additional labour as may be required " to secure a sufficient output of munitions of war. The surprise was all the greater among those who knew that the labour in question was labour for the Royal Factories and armament firms, and for them only. To one who looks back on these first beginnings in the light of the enormous achievement which they heralded, the contrast between what the Committee did and what it was commissioned to do is even more striking. In order to explain why the terms of reference were so narrow, it is necessary to review the situation which existed when the appointment was first considered in the middle of March.

The new Defence of the Realm Act had become law on 16 March. It has been shown how the original intention of this measure had been to remove certain obstacles to the diversion of labour from commercial to armament work, and so to further the programme dictated by the October policy of the War Office.[1] In the mind of the Government, this intention had been in some degree transformed and enlarged, so that the measure, during its passage through Parliament, had been described as aiming at a general redistribution of engineering resources. It had been announced that the powers obtained were to be administered through a " Central Committee " at the War Office, and that manufacturers were to be taken into consultation. Otherwise, the methods to be employed had been left undefined.

This indefiniteness of plan is readily accounted for by a comparison of the dates of the events described in the last chapter. When the Bill was introduced on 9 March, the pioneer work which the Board of Trade had been carrying on for two months was just on the point of coming to maturity. The exhibitions of samples were not opened till the following day, and no one could yet estimate either the number of offers that would be made in response, or the value of those offers in terms of actual manufacturing power. The report on the first results of inspection came forward a fortnight later, on 25 March. If the Bill could have been delayed till then, it would have been possible at least to indicate a programme of action. Incidentally, also, the Board of Trade could have been given credit for having opened up the new pathway. As it was, no reference was made in the debates to this preliminary work, and the unfortunate impression was left on the minds of the House and of the general public that the Government had done nothing towards the organisation of fresh resources—an impression which could not afterwards be removed.

Thus it was not until the last days of March that it became clear what opportunities for immediate action lay before the proposed central committee. The inspection of works by Board of Trade officials then resulted in a rough classification of firms into four groups. Two of these groups could be fitted into the established system. The small number of new firms who could take direct orders for complete

[1] See Part II., Chap. III

stores could be dealt with by the Contracts department in the ordinary course. The larger number who were willing to become sub-contractors could be put into touch with the armament firms. There remained two classes whose requirements lay outside the field of any existing routine.

In the first place, there were the manufacturers who wished to form independent Co-operative Groups in imitation of Leicester. The movement was young and vigorous ; but at this moment it had received a severe check from the War Office.

In the second place, a large number of manufacturers, stimulated by Mr. Lloyd George's speech on 9 March, and by the exhibitions of samples, were offering to place their buildings, plant and personal services at the disposal of the Government. These offers naturally differed widely in value, and needed to be carefully sifted and followed up by inquiry before they could be either turned to account or declined. The Board of Trade inspectors had already found a certain residuum of works unsuitable for munitions production. These it was proposed to treat on the lines of the new Act by transferring their labour, and perhaps also their machines, to more convenient establishments. The power was vested in the Army Council, and could only be administered through an executive committee.

It was to supplement the normal activities of the Contracts department by dealing with these two classes of firms, that the services of the Armaments Output Committee were required. Its work thus falls into line with both the alternative policies pursued by the Board of Trade—the diversion of labour from unsuitable establishments, and the spreading of contracts by means of co-operative groups. This duality of function is still reflected in the structure of the Ministry, which has always had a Labour department, alongside of the departments of Supply.

Such being the two-fold programme marked out for the new Committee by the earlier course of events, it remains to account for the terms of reference being limited exclusively to one branch of it—the supply of additional labour. The explanation lies in the change of policy at the War Office mentioned in the last chapter. This occurred exactly at the moment when the appointment of the Committee first came under consideration. The interview at which the Director of Artillery explained to Mr. Davison that the War Office still adhered to the policy of October, and was not disposed to go further with co-operative schemes, took place on 18 March, two days after the new Act became law. The Committee was not formed till 31 March ; but Mr. Booth received his first commission from Lord Kitchener on March 18 or 19. The work entrusted to him was the recruiting of labour from engineering shops in London for the Arsenal and for Messrs. Vickers' works at Erith and Crayford. Similar instructions were given at the same time to Sir Percy Girouard to find labour for Messrs. Armstrong in the Newcastle district. The intention of the military authorities at this moment was, in fact, to use the powers just obtained precisely for the purpose that had been in view when it was first proposed to obtain them, namely, the reinforcement of the armament firms at the expense of

commercial employment.[1] The terms of reference to the Committee reflect this intention, though, by the time they were made public on 7 April, the Committee had already enlarged its scope to include the other, and much wider, field of activity.

The present chapter will cover only the history of the three weeks from 18 March to 8 April, and of the measures projected in this formative stage. At the beginning of the period, the older policy held the field at the War Office; by the end of it the Committee had broken free and was launching out upon a campaign of local organisation.

II. Mr. Booth's London Enquiry.[2]

Mr. Booth had been in touch with the War Office since the previous autumn, when he had been called in as an expert adviser to the department of the Director of Army Contracts. He undertook his new work of finding labour, which might be drafted from London workshops to Woolwich, Crayford and Erith, at the personal request of Lord Kitchener. On 19 March, Mr. Runciman gave instructions that Mr. Booth should receive all necessary information from the Divisional Officers, and that the Home Office should be asked to give similar help through the Factory Inspectors. On 20 March, Mr. Booth had a long interview with Mr. Beveridge at the Board of Trade, and formed his plan of campaign.

On the same day, in collaboration with the Master-General of the Ordnance and Mr. Runciman, he revised a draft letter to be signed by Lord Kitchener, "addressed to employers presumed to have in their employ men suitable for the special needs of the Erith factory." This letter was actually issued in a considerably shorter form on 27 March.[3] The draft of 20 March will here be quoted, because it shows, even more explicitly than the terms of reference, how the original purpose of the Committee was confined to the diversion of labour from civil employment to war work:—

> SIR,—
>
> I wish to call your careful attention to two extracts from speeches made by myself and Lord Crewe in the House of Lords on 15 March, of which I enclose a copy.
>
> We are in urgent need of certain war supplies, for the manufacture of which the machinery at our disposal is in excess of the available supply of skilled labour.
>
> In order to take immediate advantage of the Defence of the Realm (Amendment) Act No. 2, I have appointed a small Committee, under the immediate control of the Master-General of Ordnance, to take the necessary steps to secure the release, from such civil work as can be postponed, of the skilled labour required for military purposes.

---

[1] See Part II., Chap. III., p. 67, note 3.

[2] Papers relating to the London Enquiry, D.A.O./7B/2016.

[3] For the final form see Appendix V. This letter and Mr. Booth's letter of 29 March (Appendix VI.) were ultimately issued to employers in other districts besides London.

My Committee will co-operate with the Committee under the chairmanship of Mr. Duke, referred to by Lord Crewe.[1]

I have appealed once for recruits for actual service at the Front, and my appeal has been met with magnificent response. I now make a second appeal to those engaged on work for civil purposes of a nature similar to that which I require for war material, to put themselves at the disposal of the Country.[2]

You will be hearing shortly from the Committee, whose chairman, Mr. George M. Booth, will be in close touch with myself in developing this important subject.

The following is a draft, dated 19 March, of a letter from Mr. Booth,[3] which was to be sent to each employer after he had received Lord Kitchener's letter:—

DEAR SIR,—

You will have just received a letter from Lord Kitchener on the subject of the special need of skilled labour for the increased output of war material. In this connection I should be much obliged if you will please fill in the enclosed form as promptly as possible.

The War Office, while prepared if necessary to make full use of the powers granted by the Defence of the Realm (Amendment) No. 2 Act, is anxious to co-operate as far as possible with employers and workmen. We should be much obliged if you would express your views as to the possibility of continuing your business upon temporarily reduced lines, should it be deemed wiser to recruit a percentage only of the workers under your employ who meet the requirements of the War Office.[4]

You are entirely at liberty to take your workmen into your and our confidence in this matter. We should like them all to know that Lord Kitchener is making this second great appeal to the manhood of England.

Every possible care is to be taken to approach all suitable employers within a certain area, and apply the same principles of recruiting to each and every case. Should any failure in this direction come to your notice, we should value immediate information.[5]

---

[1] This reference to the Defence of the Realm Losses Commission was omitted in the final version. Lord Kitchener had suggested that his Committee should endeavour to settle compensation, and bring Mr. Duke's Commission into the field only in the event of their negotiations breaking down. Mr. Booth, however, was reluctant to touch the question of compensation.

[2] The above paragraph was struck out. In place of it the letter issued has :—

"The work will be closely co-ordinated with what has been done, and is being done, by the Board of Trade in this direction."

[3] L.E. 1965/170. For the final version see Appendix VI.

[4] In the letter actually issued on 29 March, the above paragraph is reduced to the following :—

"The War Office, while prepared, if necessary, to make full use of the powers granted by the Defence of the Realm (Amendment) No. 2 Act, is anxious to disturb employers as little as possible."

[5] The last paragraph was omitted in the final version.

Mr. Booth's letter was sent out two days after Lord Kitchener's, on 29 March. The form enclosed in the letter was a questionnaire,[1] which was a modified version of the questionnaire prepared by Mr. Beveridge in January for the projected Survey of Engineering Firms.[2] It contained an inquiry into the nature of the work in hand, to what extent it was Government or private work, and whether the men were working short time, full time or overtime. The numbers of men employed belonging to 23 classes of skilled labour were to be stated, the wages they received, and the percentages engaged on Government or private work. The firms were asked whether they had inspected the samples exhibited at Aldwych Labour Exchange, and what action, if any, they had taken in consequence. Question 6 indicates the measures contemplated by the War Office :

> " (6) Assuming that arrangements for compensation in respect of private work postponed could be made under the Defence of the Realm (Amendment) No. 2 Act : (*a*) could you with *your present plant and present staff* do more Government work (1) of the class you are now doing, (2) of any other class ? (*b*) release men for armament work elsewhere ? "

Arrangements for the London Enquiry had been begun on 17 March, when the Master-General of the Ordnance visited Woolwich and gave directions for the preparation of a list of firms in S.E. London who were doing engineering work, and were likely to have mechanics whose services might be taken over. Sir H. F. Donaldson forwarded lists of 94 such firms to the Director of Artillery on 20 March. In the covering letter he wrote :—" I do not know what system it is proposed to adopt to avail ourselves of the powers granted under the latest Defence of the Realm Act ; but it would certainly appear desirable that all the firms on these lists should be visited, in order to see what class of men they have, and how many would be likely to be suitable for our work." He added that he could not allot an officer competent to judge of the men for all the purposes required in the Ordnance Factories, and suggested that the Board of Trade should fill in the numbers of skilled workmen employed by each of the firms.

The Master-General of the Ordnance forwarded the lists to Mr. Booth on 23 March. The total number of skilled mechanics required by the Shell Factory at Woolwich and by Messrs. Vickers at Erith and Crayford, was stated at 1,234.

Seven engineers were appointed as " Armament Committee's Inspectors " to conduct the enquiry. They visited Woolwich on 7 April and Messrs. Vickers' works at Erith two days later. On 12 April, Lord Elphinstone, who was by this time working for the Armaments Output Committee, met the inspectors, Mr. Graves of the Home Office, Mr. Davison, and the London Divisional Officer, Mr. Balaam. The representatives of the Home Office and of the Board of Trade described

---

[1] See Appendix VII. A draft dated 19/3/15 is in L.E. 1965/170.

[2] See Appendix I.

the steps already taken to ascertain what skilled labour and machinery were available. The Metropolitan area was divided into eight districts, corresponding as nearly as possible to the Labour Exchange areas, each under an engineer inspector, who was to report to Mr. Booth. The inspectors were later put in touch with the local Labour Exchange officials and the Factory Inspectors.

On 13 April, Mr. Booth met the inspectors and explained their duties. The North-East and South-East districts were to be visited at once, inspection being confined to firms on Mr. Booth's list.

The inspectors used the collated returns sent by employers in response to Mr. Booth's letter of 29 March. Every firm of note was visited, and reports were presented on the conditions of work and labour.

On 23 April, two of the inspectors conferred with the Defence of the Realm Losses Commission ; but no satisfactory basis of compensation for the transference of labour could be found.

The enquiry ended on May 6. The inspectors' final report[1] stated that 405 firms had been visited, and the consent of the employers had been obtained for the release of 142 mechanics. Of these, up to the present, 30 had been placed at the Arsenal, 10 at Erith and Crayford, 10 had been refused by the Arsenal, 10 had gone, or were willing to go, to other armament factories, and 41 had declined to move.

Nearly all the employers had expressed their willingness to further munitions production by every means in their power. The number of firms wholly engaged on private work was small, and most were working at high pressure with staffs reduced by 20 per cent. to 50 per cent. The number of highly skilled fitters and turners in any one works was usually very small, and the withdrawal of them would entail considerable unemployment. In one case, 900 boys and girls were dependent on the work of 23 mechanics. On the other hand, the employers were anxious to adapt and utilise their machinery for armament work.

Of the firms visited, a large proportion were wholly or partly doing Government work. Small works were making tools, gauges, jigs, and machines for larger firms holding direct contracts for war material. Considerable quantities of shell components, bombs, grenades, cartridge-filling presses, gun sights, and various other articles were being produced. Much work was also being done for transport service, cycle corps, and aircraft factories.

The work was very unevenly distributed ; a number of establishments well equipped for precision work had failed to secure orders. The inspectors believed that, if firms could be properly organised in groups, output could be considerably increased.

Apart from the reasons mentioned by the inspectors, the smallness of the results achieved in the way of actual transfer of men was

[1] D.A.O./7B/2027

partly due to the fact that the ground had been thoroughly worked over by the Board of Trade in January. Further, no special inducements to move were offered to the men, and recruiting for the Army was still uncontrolled. In one case a number of men whom their employer had agreed to release for munitions work, were enlisted in the interval before they were called upon for transfer.

In this area, at any rate, the enquiry confirmed the conclusion reached by the Board of Trade that the possibilities of diversion of skilled labour were exhausted.

III. Sir Percy Girouard's Tyneside Enquiry.

Concurrently with Mr. Booth's efforts to secure labour in the London area, Lord Kitchener requested Sir Percy Girouard, who had served under him in South Africa and was now managing director at Elswick, to report what measures he considered necessary or desirable with regard to the supply of additional labour for the armament works on Tyneside.

Sir Percy Girouard interviewed the Master-General of the Ordnance and the President of the Board of Trade on 19 March. Arrangements were made for statistics to be supplied to him by the Board of Trade from the Z8 returns, showing what factories and railway workshops in the Newcastle area were working short time, full time, or overtime, with a view to an estimate of the amount of labour that might be diverted.

On 22 March, Sir Percy Girouard concerted his arrangements with the Divisional Officer of the Scottish and Northern Division and the local Inspector of Factories at Newcastle.[1] He sent to Mr. Booth on 26 March a statement of the labour needed at Messrs. Armstrong's works. Elswick could take from 1,600 to 1,700 hands. Alexandria needed 275 men; and, as soon as the relaxation of restrictions should admit of the use of unskilled and female labour for shells and fuses, another 275 men weekly for eight weeks would be wanted.[2]

In a report to the Master-General of the Ordnance, dated 25 March, Sir Percy Girouard stated that, in the Tyneside area, the statistics showed that there was a considerable body of labour which, it was thought, might be diverted to Government work from factories not fully employed on such work, or not working full time or overtime. This report also outlined a general scheme of organisation for the distribution of munitions labour throughout the country, which will be considered later.[3]

At Newcastle, the actual work of transfer was done by the North East Coast Armaments Committee, appointed early in April. An account of this Committee will be given in the next chapter.

---

[1] L.E. 1965/126. [2] L.E. 9263. [3] See below, p. 64, D.A.O./Area 1/557.

IV. Other Measures for the Supply of Skilled Labour to Armament Firms.

On 31 March Lord Kitchener wrote to the President of the Local Government Board inquiring whether the local authorities were likely to have in their employ any men, skilled or unskilled, who could be spared to assist in the manufacture of munitions. The Board had already been approached by the Committee of Imperial Defence in January, and had issued a circular to local authorities on 11 March, urging them to release men both for military service and for munitions work. The circular was now followed up by visits of the engineering staff of the Board to some 700 local authorities. By 6 May, lists had been obtained of some 30,000 men who were offered to the War Office.[1] The lists were referred to the Labour Exchange department, who were requested to arrange for the actual transfer to armament firms of such of the men as proved to be suitable It was found that about 84 per cent. were unskilled labourers, for whom it was difficult to find employment.

Lord Kitchener also interviewed the Executive Council of the Amalgamated Society of Engineers at the War Office on 1 April.[2] After explaining the powers conferred on him by the new Defence of the Realm Act and dwelling on the imperative need for increased output, he pointed out that new factories had been built by the armament firms and equipped with machinery, while others were in course of construction. What was needed was a sufficient supply of labour to man these machines.

In his report of this interview, the Chairman of the Executive said that the Council were deeply impressed by the statement. Incidentally, the word "conscription" had been mentioned. Lord Kitchener had remarked that the best way to stave off conscription was to agree to his proposals and to fill the shops with the necessary supply of labour. The Chairman recommended the Society to take a large view and to render all possible assistance.

V. Mr. Allan Smith's Programme.

Meanwhile, on 31 March, the day on which the Armaments Output Committee was appointed, a preliminary meeting, presided over by Lord Kitchener, was held to discuss the scope and methods of its activities. After this meeting, Mr. Allan Smith drew up a memorandum, which was read over at a second conference on 6 April and verbally approved by Lord Kitchener. It will be observed that this document contemplates making a much larger use of the powers under the new Act than the mere transfer of skilled hands to armament firms. It is rather a scheme for that general re-organisation of engineering resources which had been foreshadowed in the ministerial speeches on the introduction of the Bill.

---

[1] Chief Engineer, L.G.B., *Report* (6/5/15). M.C. 405.

[2] A.S.E. *Monthly Journal and Report*, April, 1915, p. 22.

The proposals may be summarised under several heads[1] :—

(1) PRELIMINARY INVESTIGATIONS.

A War Office representative was to be appointed for each district, to report on the capabilities of the factories for munitions production, using the help of the Labour Exchanges and Factory Inspectors and keeping in touch with the local Employers' Association.[2]

Returns were to be procured giving detailed information about each factory : (1) the description, numbers, and capacities of the machines ; the general nature of the work turned out ; the extent to which semi-skilled and female labour was, or might be, employed ; lists of machines idle owing to shortage of workpeople or want of orders ; particulars of new installations in progress and the anticipated date of completion ; (2) the number of workpeople of the various classes employed ; (3) whether the factory was at present on short time ; (4) Railway facilities ; (5) the prospect of securing semi-skilled, unskilled, and female labour in the district ; (6) housing accommodation available for labour from outside.

Delays in the erection and equipment of shops for Government work, and transport difficulties, were to be reported, in order that the Committee might take the matter up.

With respect to workpeople, information was to be obtained for each district on the following points : (1) to what extent women and boys were employed in industries other than engineering, and the suitability of such labour for transfer to engineering factories ; (2) whether any difficulties had occurred in introducing semi-skilled, unskilled, and female labour on engineering processes ; (3) the flow of labour to armament districts : what proportion had remained, and for how long ; what proportion had returned or left for other districts, and for what reasons ; (4) the system of payment—time, piece-work, or premium bonus ; (5) to what extent workpeople would be willing to go to war work in other districts. It would be intimated that factories might, if necessary, be closed in order to set free their labour.

Particulars were also to be procured as to the extent to which armament firms had sublet their work ; the names of the sub-contractors ; the nature of the work ; whether the delivery dates had been kept, and the work satisfactorily done.

---

[1] The substance of the document has been freely re-arranged for the sake of clearness. Copy in HIST. REC./R/171/18.

[2] It was presumably with this purpose in view that Lord Kitchener wrote on 31 March to Mr. Runciman : " I want you to find me 10 ' Booths ' or men slightly younger but with his business capabilities and push. They should have local knowledge of such districts as Sheffield, Birmingham, Coventry, Manchester, Liverpool. I leave you to add other districts from which it is likely that we can obtain labour. May I have the names to-morrow, and we will arrange for them to take over the work ? " On the previous day, Lord Kitchener had asked Mr. Cecil Baring for 50 Booths, and Mr. McKenna for 50 Factory Inspectors to be attached to them. He was persuaded by Mr. Booth to reduce his demand to 10.

(2) MEASURES PROPOSED.

(*a*) *Factories.*—The memorandum proposed methods of treatment applicable to various classes of factories.

Factories which had been specially equipped for munitions work were to be provided with the necessary complement of labour.

Other factories were to be utilised for munitions work suitable to their machinery, provided that workpeople and superintendents should not be drawn from armament shops without the Committee's leave. The armament firms were to give full information and allow representatives of firms undertaking War Office work to examine processes. Workpeople were not to be taken from a factory engaged on war material without the consent of the Committee. Unless the job could be completed in a factory, the parts should be under sub-contract to an armament manufacturer, or co-operation should be arranged in districts, so that the job might be completely finished before it left the district: *e.g.*, aeroplanes at Glasgow; shells at Leicester; field carriages, etc., at Barrow.[1]

Where the machinery in a factory was not being used to the fullest advantage, it was proposed that contracts (mainly sub-contracts) for War Office work should be re-distributed among other more suitable factories, and replaced by work that could be more conveniently done.

Factories not on Government work and not convenient for the purpose were to be examined by the War Office representative in the district with the help of a special engineering inspector. If it should be decided to close the factory or any part of it and transfer the labour elsewhere, the inspector, with an accountant appointed in the district by the Committee, was to adjust with the owner the basis of compensation.

(*b*) *Contracts for Neutral Countries.*—Particulars of all armaments, munitions and machine and other tools and plant in course of completion for neutral countries were to be obtained. Such work should not be proceeded with except with the consent of the Committee, who might order it to be diverted to any home factory they should indicate.[2]

(*c*) *Labour demands* were to be carefully scrutinised.

(*d*) *Inspection* was to be relaxed so far as might be consistent with maintaining the necessary quality. Additional inspectors should be appointed. Delays and difficulties connected with inspection were to be reported to the Committee.

(*e*) *Supply of raw materials.*—In selected steel works, merchant work was to be stopped, or so restricted as to yield the required supply of ingots and bars. The destination of these products could be settled: *e.g.*, daily or weekly supplies sent to certain factories. This would chiefly affect merchant ship plates, and bridge plates and girders. Slackening of pressure in merchant shipbuilding would also set free some engineers for war work.

---

[1] This is the only reference in the memorandum to the scheme of Co-operative Groups.

[2] It will be noted that this paragraph contains the germ of the schemes of Priority later set on foot.

(*f*) *Volunteer Industrial Corps.*—It was suggested that a Volunteer Industrial Corps, subject to a certain amount of discipline, should be formed for industrial service in any part of the kingdom. They would receive their own district rate and also army pay (both on the basis of a full working week), and working-out allowances, if called upon to leave their homes. Disputes as to rates and allowances could be settled under the Government scheme for settling disputes.

(3) LOCAL ORGANISATION.

It was proposed that the Engineering Employers' Federation should communicate with their local Associations, referring to the appointment of the Committee and to the provisions of the Defence of the Realm Acts, and asking them to appoint small local committees, representative of the various branches of industry carried on in the district.

These local committees would be available for consultation, to superintend the carrying out of the central Committee's instructions, and generally to assist in matters referred to them and to make suggestions.

Mr. Allan Smith's programme, though much of it was dictated by the new Defence of the Realm Act, in some points resembles a remarkably complete scheme for a central organisation to co-ordinate engineering resources, which had been propounded by Mr. Alfred Herbert, in consultation with Mr. Dumas, five months before. In particular, both schemes contemplate that the central Committee should work through the machinery of the Engineering Employers' Federation. Mr. Alfred Herbert's plan deserves some detailed description. It had been put forward in a letter written on 3 November, 1914, to Sir Arthur Lawton, then Acting Chairman of the Emergency Committee of the Federation.

Mr. Herbert proposed the formation of a small Committee, on which the Federation, the Ordnance Factories, the armament firms, and the Treasury were to be represented. Its functions were to consist in "co-ordinating the efforts of private engineering firms in such a manner as to best assist the Government Factories and the Armament Companies in increasing the production of war material."

The duties suggested were of a very wide scope. They covered the supply of raw material, particularly forgings; the production of gauges and special tools; securing the necessary machinery; distribution of Government work to firms not already engaged on such work; arranging the bases of payment and the passing on of work in various stages of completion from firm to firm; subsidising firms which did not dispose of sufficient capital; redistribution of labour; checking the enlistment of skilled mechanics; arranging with the authorities for the diversion of work in progress from private or foreign customers to the Government, and for compensation for losses through claims for breach of contract; promoting relaxation of the Factory Act, to allow longer hours and employment below the present age limit, with proper safeguards; and framing regulations to facilitate the use of female labour.

The central Committee was to work through the local branches of the Engineering Employers' Federation.

The Federation did not at the time take up this proposal with enthusiasm. Mr. Dumas, however, after the first meeting (8 January) at Leicester,[1] communicated the scheme to Sir H. Llewellyn Smith at an interview on 15 January. His suggestions included the central and local organisation outlined in Mr. Herbert's letter, and he proposed that the Committee should work on the basis of returns furnished every four weeks by firms not wholly engaged on Government work, stating the amount spent during the period on direct labour (*a*) for Government work and (*b*) for all customers' orders.

Mr. Herbert and Mr. Dumas, though the machinery of the Employers' Federation was not adopted as the basis of the organisation, foreshadowed to a remarkable extent the functions ultimately to be assumed by the Armaments Output Committee, with which they both co-operated later.[2]

One part of Mr. Allan Smith's programme was at once carried out by the issue, on 12 April, to War Office contractors and sub-contractors of a letter enclosing a form of Return (P.R.1),[3] which they were requested to fill up weekly. The object in view was, not to place contracts, but rather to explore the situation and to remedy any causes of delay in production which the returns might reveal. The form was sent, in the first instance, to 122 establishments. On 13 May about 60 more were added.

The return was to show what proportion of the firm's plant and machinery was at present engaged on production of shells and fuses, or parts thereof, and whether it was being used to the fullest extent ; what surplus there was that could be adapted for such production ; if the plant was not fully employed, whether this was due to shortage of orders, or of labour, or of raw material, with details as to requirements, causes of delay, etc.; particulars as to installation of any new plant and the labour required for it ; and any complaints as to delay connected with drawings, designs, inspection, shipping instructions, etc.

These returns were furnished up to the week ending May 21. After that date, a letter was issued stating that the information supplied had been of great value, and had now served its purpose. The Committee, however, offered to continue the assistance it had already rendered in many cases to contractors in hastening the deliveries of supplies from firms in default.

VI. The Personnel of the Committee and its Work.

On 7 April, the day after Lord Kitchener had approved Mr. Allan Smith's programme, appeared the announcement that the Committee was appointed to " take the necessary steps to provide such additional labour as may be required." The discrepancy between this comparatively small and manageable task and the prospects opened out in the programme might be taken as a measure of the inadequacy of the

[1] See above, p. 11.

[2] Correspondence and memoranda relating to Mr. Herbert's and Mr. Dumas' schemes, HIST. REC./H/1121/1.

[3] D.A.O./7B/2016. HIST. REC./R/171/4. See Appendix VIII.

Committee to the work required for it, if it were not that the programme itself represents only a part of the problems that crowded in upon Mr. Booth and his small band of assistants in the next few weeks. It is obvious that Lord Kitchener and the Master-General of the Ordnance could not take part in the details of executive work. Sir Algernon Firth co-operated in his official capacity as President of the Associated Chambers of Commerce. Sir Herbert Walker had been included because there had been some suggestion that the Railway Executive Committee, of which he was Chairman, might be federated with the central organisation.[1] Since this suggestion fell through, Sir Herbert Walker was never an active member. The whole burden of the work fell upon Mr. Booth and Mr. Allan Smith.

When a beginning of departmental work was made on 31 March, in order to collate the information supplied by employers in response to Mr. Booth's letter, the War Office had provided neither accommodation nor staff. Mr. Booth borrowed from the Board of Trade a few assistants and a room at the Labour Exchange Central Office in Queen Anne's Chambers. It was not until two days later that a room was found for him at the War Office.[2]

In these circumstances, Mr. Booth, with the small staff he was gradually able to gather round him, had to deal with the information already collected by the Board of Trade and the Home Office; with the P.R.1. Returns; and with an increasing volume of correspondence elicited by Mr. Lloyd George's speech of 9 March, by Mr. Booth's own letter of 29 March, and by the announcement of the Committee's appointment.

Offers of services from persons of both sexes and every class; offers of premises or of machinery; offers of surplus stocks for sale; requests for contracts; descriptions of inventions; suggestions on every conceivable subject connected with munitions, poured in at a rate which made it impossible even to acknowledge more than a small proportion.[3] All this correspondence was in addition to Mr. Booth's work on the London enquiry, to the programme outlined by Mr. Allan Smith, and to other vital matters, such as the checking of enlistment, release from the Colours, and so on, which soon called urgently for Mr. Booth's intervention. Meanwhile, the employers who had been repeatedly approached and appealed to, were beginning to be impatient of filling up one return after another, and wondering when something definite would be done.

Mr. Booth was, in fine, the first, and perhaps not the least successful, example of a man of business, with no inside knowledge of the methods of government and no staff of experienced civil servants, called in to do, all but single-handed, work which would have taxed the energies of a regular Department of State. His position was exceptionally difficult in that he was not even the independent head

[1] This was, for example, suggested in Sir Percy Girouard's Report to the M.G.O. of 25 March.

[2] This room (No. 367) and the adjoining rooms were occupied till the removal to Armament Buildings.

[3] For Mr. Booth's correspondence see Appendix IX.

of an embryo department, but only the chairman of a committee deriving all its executive power from the Master-General of the Ordnance or the Secretary of State for War.

This dependence was still further complicated, almost from the outset, by the creation of yet another body, claiming to direct the policy of the Committee.

VII. The Munitions of War Committee.

When the Armaments Output Committee had been in existence for barely a week, it became informally, though not technically, subordinate to the Munitions of War Committee ("Treasury Committee"), under the chairmanship of Mr. Lloyd George.

The Prime Minister announced the appointment on 8 April, and the names of the members were given in the House of Commons a week later.[1]

The original members were :—

Mr. Lloyd George, Chairman,
Mr. A. J. Balfour,
Mr. E. S. Montagu,
Mr. G. M. Booth,
Major-Gen. von Donop, } representing the
Mr. Harold Baker, } War Office
Sir Frederick Black, } representing the
Admiral Tudor, } Admiralty
Mr. A. Henderson,
with power to add to their number.

Sir H. Llewellyn Smith was co-opted at the first meeting (April 12), and Sir Percy Girouard was added later (26 April).

In his announcement the Prime Minister said :—

> "The appointment of such a Committee was decided upon a month ago,[2] and the Departments have been busy preparing the ground for its activities.
>
> "The function of the Committee is to ensure the promptest and most efficient application of all the available productive resources of the country to the manufacture and supply of munitions of war for the Navy and Army. It has full power to take all steps necessary for that purpose."

It will be observed that these terms of reference covered a much wider field than the instructions originally given by Lord Kitchener to Mr. Booth's Committee, and were indeed wide enough to include any possible measures that might be taken.[3]

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXI., 39 (15 April).

[2] *I.e.*, about the time when the Defence of the Realm (Amendment) No. 2 Act was introduced.

[3] Copies of the minutes and other papers printed for this Committee (numbered M.C.1 ff.) are in HIST. REC./R/172/1.

The relations between the two bodies were explained by Mr. Lloyd George, on 21 April, as follows :—

> ' Mr. Booth . . . is a man of great energy and organising capacity, and his Committee is the executive committee for carrying out the policy which is very largely determined now, under the supervision of the Secretary of State for War, by the administrative Committee of which I am chairman . . . We decide matters of policy ; we cannot undertake executive work. That must be done by the War Office, and they have instructed this Committee, of which Mr. Booth is the great co-ordinating element."[1]

The Munitions of War Committee was, in fact, an overriding committee, which directed the course pursued in the next two months.

The Committee met for the first time on 12 April, and again on 14 April. At these preliminary meetings, its first task was to survey the actual and prospective state of munitions supplies, and to set on foot enquiries into the methods adopted in France and America for increasing output.[2] At four later meetings, held (on 26 April and 7, 12 and 13 May) before the reconstruction of the Government in the fourth week of May, decisions were taken on a number of outstanding questions, which will be mentioned at the appropriate places. The most important act of the Committee was the adoption, on 26 April, of a scheme proposed by Sir Percy Girouard.[3] This finally led to the detaching of the Armaments Output Committee's work from the War Office and the formation of a Ministry of Munitions.

For the moment, it is important to note that the influence exercised by this body on the Armaments Output Committee was from the first in the direction of the Board of Trade policy. In the speech of 21 April above quoted, Mr. Lloyd George described as follows the change that had taken place in the views of the Government since the beginning of the year, and his own attitude towards the main issue :—

> " It was discovered in December that the supply would be inadequate—that the contracts would not come up to time. The first effort made by the War Office was to fill up the labour deficiencies in the armament firms, because it is obviously better that you should get your men under the direct supervision and control of those who for years have been undertaking this kind of work. If, therefore, we could enable the armament firms to deliver their munitions according to contract by supplying deficiencies of labour, it was obviously better than giving the work to those who had no experience at all, and who,

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXI., 323.

[2] An account of Messrs. Lobnitz and Moir's mission to France is given in Appendix IV. A report by Mr. Wolff on American methods was also printed for the Committee (M.C. 5).

[3] See below, Chap. IV., p. 61.

no doubt, would have made failures at first, and have supplied us with materials which would not have exploded and which might have caused mischief. An effort was, therefore, made through the Labour Exchanges by the Board of Trade to get as many men as we could possibly find to send to these armament firms and sub-contracting firms for the purpose of enabling them to carry out their contracts.

"At first that was very promising. In the first month a very considerable number of men came in. The second month did not look quite so promising; and by the month of March it was perfectly clear that we could not supply all the deficiencies of labour in these firms.

"That was why we were driven to the other course . . . It would have been better if we had succeeded in obtaining the transfer of men, but that is a matter for the men themselves . . . We went to the utmost limit of the policy of transference of men, and we then came to the conclusion that it would be absolutely necessary to take other steps. And that is why I introduced in this House in the month of March the Defence of the Realm Bill, to equip the War Office and the Admiralty with the necessary powers for taking over engineering works.[1] It was the second-best course, and that was why we hesitated to take it until we found it was inevitable to supply the necessary munitions, not for present purposes, but for the prospect in front of us . . .

"We are, and have been during the last few weeks, proceeding on the assumption that to depend upon those who have hitherto had experience in turning out munitions of war, even by any process of sub-contracting and of pressing labour to go there to fill up deficiencies, will not be sufficient to meet the demands with which we shall be confronted in the course of the next few weeks, and that it is necessary for us to take the risk of organising shops which have not hitherto been employed for this purpose."

In the same speech Mr. Lloyd George referred to the co-operative system adopted by the French, and to the Cabinet mission to France in October, 1914.[2] The only documents prepared in advance for the first meeting of the Munitions of War Committee were an extract from Lord Reading's diary recording this visit and a Note by Sir John Simon on the report made by him to the Cabinet Committee on Munitions when the mission returned. Mr. Lloyd George, in fact, adopted the principle which had already been carried into practice at Leicester.

---

[1] This statement illustrates in an interesting way the change of Government policy with regard to this Act, which, as has been pointed out above (Part II., Chap. III.), was originally designed to further the old policy of transference of labour.

[2] See above, Chap. I., Section IV.

Mr. Booth thus received support from this quarter in the vigorous campaign carried on by his Committee in the month of April for the development of co-operative production.

Nor was it only in this respect that Mr. Booth's position was strengthened by having the Munitions of War Committee at his back. The Armaments Output Committee was at first no more than an excrescence on one branch of a single department; it was not even an integral part of the great War Office machine. As its chairman, Mr. Booth might hope to influence the Master-General of the Ordnance and Lord Kitchener; but he could not intervene with any independent authority in certain large questions which lay very near the root of his problem. In the first place, within the War Office itself, there was a sharp conflict of interest between the Adjutant-General's Recruiting department and the Contracts Branch of the Master-General of the Ordnance. Every skilled workman enlisted in the new Armies was a man lost, and often irrecoverably lost, to munitions production. In the second place, Mr. Booth had no official status qualifying him to negotiate a reconciliation between the claims of the War Office for recruits and for armaments workers, and the equally urgent needs of the Admiralty for shipyard labour. The two Departments, through their local agencies, were competing in unchecked rivalry, not only with one another, but with the general trade of the country at every important centre of industry. Hitherto, the only authority superior to the Departments, and able to confront their respective claims and adjudicate between them, had been, of course, the Cabinet. Here Lord Kitchener, necessarily and rightly, held a position of unrivalled prestige. His policy was clear: first and foremost, to obtain enough men to fill the ranks of his new armies; secondly, to enlarge and strengthen the armament firms which were to equip them with munitions. What effect this might have, either on the general trade of the country or on the smaller concerns whose men were to be recruited for the ranks or for the armament firms, it did not lie within his special province to consider.

The Munitions of War Committee, on the other hand, was presided over by a Minister whose primary interest was in munitions production; and Lord Kitchener was not a member. It could, accordingly, study the whole problem of munitions and man-power from another angle, unbiassed by the legitimate pre-occupations of the Secretary of State for War. Though no one could yet foresee the stages by which this problem would grow and spread until it came to involve, directly or indirectly, the whole fabric of industry and the whole working population of the country, the moment was approaching when the handling of it could no longer be left to the War Office and the Admiralty, Departments whose structure and traditions had taken shape under conditions in which the problem did not exist. The appointment of the Munitions of War Committee marks the moment at which the Government appreciated this paramount fact. The establishment of a Ministry to take independent control both of production and of labour supply for armament purposes was the logical consequence.

To Mr. Booth and his Committee, the shift by which they passed from being an extraneous departmental committee of the War Office

to acting as the executive of this new and powerful Committee at the Treasury, meant a great increase of authority. Mr. Booth, as himself a member of it, could now deal directly, on the one side with the Cabinet through Mr. Lloyd George, and on the other with the influential representatives of the War Office, the Admiralty, and the Board of Trade. Left to his own devices in Room No. 367 at the War Office, he might have beaten his wings in vain.

CHAPTER III.

LOCAL ORGANISATION, 31 MARCH TO 28 APRIL.

I. The Scheme of A and B Areas.

The measures so far described were initiated before the Armaments Output Committee was formed on the last day of March. Its policy, when it was formed, was predetermined by another decisive factor. This was the effective support given to the Board of Trade by Mr. Booth, who realised that the whole problem could no longer be dealt with by the mere diversion of labour from private work, but called for a reorganisation of the industry on a basis acceptable to the manufacturers themselves and adjusted to local conditions.

Addressing a deputation from Manchester on 29 April, Mr. Booth referred to his advocacy of this standpoint in the following words :—

> "Every district will have its own methods. . . . To be purely personal for a moment, the reason that I came here was that I advocated, and persuaded the Government to support my advocacy, that the country should be divided up in this manner—that the big shop was the best, but that the country had thousands of small shops, and that you could not move them more than a certain amount, and therefore you must take the work to them. It is evident, however, that there is a limit of smallness ; but you could take it further than I ever dreamt of."[1]

Mr. Booth, as has been seen, had carried through the negotiations with the Leicester group formed on 23 March.[2] While he was setting about the work entrusted to him by Lord Kitchener, he was at the same time bridging the gulf which had opened between the War Office and the Board of Trade. In concert with Mr. Beveridge, he now devised a scheme which would effect a compromise between the conflicting policies of the two Departments, by delimiting the spheres within which they could be severally and concurrently pursued.

The basis of this compromise was the division of the country into areas of two types, which were designated by the letters A and B.

An A Area was a district within a radius of about 20 miles, measured from any one of the Government Factories or of the recognised armament firms on the War Office List. Such an area was to be

[1] A.O.C. *Printed Minutes*, p. 118. HIST. REC./R/171.
[2] See above, p. 17.

treated as a preserve for the older policy of concentrating the flow of labour upon the armament firms. So long as the machines at the new factories they had erected were undermanned, no new contracts were to be placed with other firms inside these areas.

All other districts where engineering capacity could be found were to be B Areas; and in these the Board of Trade policy of forming Co-operative Groups was to be permitted, subject to provisions strictly safeguarding the A Areas from any encroachment upon their resources.

The outlines of this treaty were indicated in a memorandum by Mr. Davison,[1] which was sent out to Divisional Officers on 27 March, after it had been approved by Mr. Booth :—

> "The War Office have in the last few days agreed to stand by their original proposal to place new orders for the manufacture of shells or fuses with any new firms, or groups of firms, which may be discovered, by means of the exhibitions of samples, to be capable of undertaking this work. At the same time, the War Office are more anxious to increase the supply of labour and material to the existing armament manufacturers than to place fresh orders with firms inexperienced in the work, and they would not consider placing any contract which might interfere with the present output of war material.
>
> "In view of the shortage of labour on existing orders, it also appears unlikely that the War Office will be willing to give out any new contracts in the neighbourhood of the principal armament firms, a list of which is enclosed.[2] It is, therefore, suggested that, for the present, effort should only be made to find new firms or groups of firms outside the radius (say, one hour by train) within which any of the firms on the list are established and might obtain additional labour.
>
> "It should be made clear to any new firms or groups of firms that the work must be undertaken with their existing staff, and that the raw material and any new plant required must be obtained by them from sources whose output is not wanted for existing Government orders. The War Office will require to be satisfied on these points before placing orders."

It was added that, while some firms might be found capable of undertaking orders singly, the group system, just put into practice at Leicester, seemed to be the most promising plan. The War Office would probably accept an offer of as few as 100 shells a week. As a rule, they would consider only offers of complete

---

[1] *Contracts for Shells and Fuses.* L.E. 1965/129.

[2] A revised list, prepared by Mr. Beveridge on 29 March, was issued to the Divisional Officers on 1 April. See Appendix X.

shells; but, unless the firms were confident that they could make fuses (which the War Office did not expect), they were to apply for orders for shells complete except for the fuse. Forgings might perhaps be supplied from other Divisions.

> "It may be added that firms possessing suitable plant are asked to regard it as their duty to devote their whole resources to this national work, and many engineering manufacturers have already offered to cease all work on private orders for the present.
>
> "Where it appears desirable that a considerable number of firms should combine together, meetings should be arranged under the auspices of the local Employers' Association or the Chamber of Commerce."

In order to make sure that this scheme of compromise had the official sanction of the War Office, Mr. Davison drew up on the same day (27 March) a memorandum of the proposed procedure, which he communicated to Mr. Booth.[1]

This memorandum elicited from the War Office an authoritative statement, which Mr. Booth forwarded to Mr. Davison on 30 March. It will be quoted at length, since it clearly defines the position of the military authorities at the moment when the Armaments Output Committee was formed.

General Instructions for Officers Visiting Districts Suitable for Providing Labour for Armament Work.[2]

Method of increasing output of munitions of war to be adopted for immediate practice.

Method I.—Concentration of labour on any firm already making armaments (and particularly fuses and shells), provided the War Office is completely satisfied that

(*a*) such firm has the necessary plant available, and needs *labour only* to increase production;

(*b*) such firm can supervise properly the increased production that will result from the additional labour supplied.

If these requirements, (*a*) and (*b*), are met, the War Office will endeavour to obtain for such firm the additional labour required by getting other firms to release men from employment

---

[1] *Supply of Armaments* (27/3/15). L.E. 1965/125.

[2] Copy in L.E. 1965/125.

on the production of non-war material, avoiding, if possible, the use of the new powers granted to the War Office under the Defence of the Realm (Amendment) No. 2 Act.

The difficulties of moving labour at all, and the tendency for men to return home, if moved, after a few weeks' work, has led to the decision to confine for the present the work of labour concentration within such geographical limits as will avoid a change of home.

Method II.—The encouragement of fresh production from firms not now making shells and fuses (though probably engaged to a greater or lesser extent on engineering contracts for war materials). Co-operative principles (as in the Leicester proposal) may have an important bearing on this method, which is subject to the following rigid conditions:

Such new firms or group of firms must satisfy the War Office that this fresh production of shells will be produced from

(*a*) material not at present destined for war supplies;

(*b*) labour not at present employed in the manufacture of war supplies;

(*c*) supervision not at present employed on the production of war supplies in the same or other districts; and that

(*d*) no attempt of any sort or kind be made to interfere with or secure the labour, raw material, or supervision of firms in the printed list of Government contractors and sub-contractors which will be attached to any order obtained under the above restrictions.

It was upon the basis of this understanding that the Armaments Output Committee opened its campaign of local organisation.

II. Mr. Booth's Programme of Local Organisation.

The scheme of A and B Areas, like other projects of this crowded period, was short-lived. It governed the operations of the Committee through what may be called the first phase of its existence, that is to say, for about three weeks, from 31 March to 20 April. Then, after the arrival of Sir Percy Girouard at the War Office, it was fundamentally remodelled, for reasons which also led the Committee to enlarge its own scope and functions. In the last ten days of April the Committee was, in fact, ceasing to be a Committee, and beginning to be a department—a transformation which was effected so rapidly that on 22 April Mr. Booth spoke of "the original Kitchener Committee" as if it had been a different body.[1]

[1] A.O.C. *Printed Minutes*, p. 45. HIST REC./R/171.

Mr. Booth laid down his programme in a memorandum entitled "*Draft general instructions for prosecuting the special duties allotted to the Executive of the War Office Armaments Output Committee.*"[1]

The main concern of the War Office, at the present moment, was the failure of practically all their contractors to deliver, according to promise, shells, fuses, and guns. The most urgent need was for fuses and shells, particularly 4·5" and 18-pdrs. In order to make the fullest use of the existing skilled labour, two alternative methods were open.

(1) *A Areas.*—"An A Area is a district in which are situated one or more firms already producing shell and/or fuse and/or guns, provided that such factory or factories possess buildings and plant available for immediate use in excess of the labour now engaged." In these districts, in order to ensure that the whole of such existing plant should be fully employed on Government work, it would be necessary to draft in from outside skilled labour employed either on private contracts, or on less urgent armament contracts.

(2) *B Areas* were defined as districts "where at present no direct War Office contracts or sub-contracts from the main War Office armament firms have been placed."[2] Such areas were to be scheduled in respect of suitable plant and labour, and schemes of co-operative production were, if possible, to be developed.

The memorandum proceeds :—

> "In order that no time should be lost in pursuing both methods, the particular difficulties applicable to each method should be clearly understood, and the points of contact or similarity between the two methods grasped ; and, in order to make the very best use of both methods, it is held to be essential that in each area there should be established a strong committee representing the facilities required, upon whose judgment, subject always to the final decision of the Committee, the Executive would largely rely for the final course to be pursued. For instance, one district might be able to release a larger number of men for A Areas, while at the same time converting to armament uses a limited amount of machinery and a corresponding amount of labour. Another district might be able to surrender all available men for transfer to A Areas by closing down all

---

[1] HIST. REC./R/171/16.

[2] It may be noted that this definition, if strictly interpreted, would have excluded almost every centre where suitable engineering resources could be found. At this time Mr. Booth did not realise how extensive were the ramifications of sub-contracting. The definition, moreover, is contradicted by the statement below that the rougher processes of gun-making and the making of carriages, limbers and wagons were "at this moment being done in B Areas." The B Area would be correctly defined as "any district outside a radius of 20 miles from a Royal Factory or armament firm."

non-essential work. Compensation might enter into either of these categories.

"Certain obvious difficulties arise in connection with A, such as housing; but energetic steps are being taken to make concentration of labour feasible. The greater advantage of the A Area method is the knowledge that first-class production is already coming forward. Supervision is simplified; also inspection. These advantages may outweigh certain objections of the "too many eggs in one basket" type, and the equally serious objection of over-straining organisations already seriously overtaxed.

"There are equally obvious objections to the B Area method. The finished process in the manufacture of guns and mountings must be ruled out, while the rough preliminary turning and boring of gun tubes, and, of course, the manufacture of gun carriages, limbers and wagons, is at this moment being done in B Areas. The simpler classes of shell are, however, suitable for the method, and it is held that machinery now idle or employed on non-essential work, together with labour which practically could not be moved, may be made available for such production, and that, too, at a very early date, if sufficient assistance is given to the new effort in the way of free inspection of work now being done, with ample samples of the particular shell in question at every stage of its production.

"*Procedure.*—The immediate steps to put into effect the above general instructions are as follows:—

"As rapidly as the Committee can arrange them, meetings are being held at the War Office with representative district Committees. Leicester and Lincoln have already given actual practical assistance, and other districts follow immediately. The information obtained at each meeting will be scheduled and made available for succeeding meetings, and any general lines of advice, as the knowledge of procedure develops, will be submitted beforehand to new districts as they come forward, and, of course, within a very short period the War Office will have at its disposal the complete series of samples that are so necessary for rapid, accurate production."[1]

Such were the main principles followed by the Committee during the first three weeks of April, while it was still under the undivided control of Mr. Booth. This period witnessed the rapid formation of

[1] It was explained that a new design of shell, admitting of the use of Basic Steel, was now being prepared, and consequently no samples were available at present. Arrangements were, however, being made with the firm whose work on this shell was most advanced, to place at the Committee's disposal, from stage to stage, the results of its experimental work.

local committees of two types, corresponding to the needs of the two sorts of Area. In the A Areas of Newcastle and Glasgow, Armament Committees were created whose principal function was the transfer of labour to the armament firms dominating those Areas. In B Areas, Co-operative Groups were nursed simultaneously by the Board of Trade, the Engineering Employers' Federation, and the Associated Chambers of Commerce.

In the following sections the history of the two A Area Committees will first be reviewed. Considered as a social experiment, the type of local body they exemplify is of great interest. The North-East Coast Armaments Committee was the earlier of the two in date, and provided the model which was followed at Glasgow. For this reason, and also because it was more effective, it deserves the closer study. The Glasgow and West of Scotland Armaments Committee will be mentioned only in connection with points where the experience and the results were different.[1]

III. The Armaments Committees in the A Areas of Newcastle and Glasgow.

(*a*) The Composition of the Committees.

The formation of the North-East Coast Armaments Committee arose directly out of Sir Percy Girouard's mission to report on the possibilities of transferring labour within the Newcastle district to Elswick.[2] Captain Creed, who was recommended by Sir Percy Girouard, received instructions from Mr. Booth on 30 March to set about organising the actual work of transfer. In the interval before the Committee was appointed, he started on lines similar to those of Mr. Booth's London Enquiry, the first object being to supply labour to Messrs. Armstrong's works. Since, however, the shipbuilding and ship-repairing work on the Tyne was at least as important as the munitions production, the claims of the Admiralty had to be taken into account. When the Committee was established after a public meeting at Newcastle on 9 April, the Admiralty was represented on it by Captain Power, the Captain Superintendent on the Tyne. The function of the Committee was thus widened to include labour for naval as well as for armament work. The same principle held true of the Clyde district, where the Glasgow and West of Scotland Armaments Committee was set up on 30 April.

Such success as these Committees achieved—though, for reasons to be considered later, it was markedly greater at Newcastle than it was at Glasgow—must be in great measure attributed to the principle of their composition, which was essentially the same in both places. At Newcastle, the Executive Committee combined the representation, in

[1] A detailed history of these two Committees is given in Appendices XIV. and XV.

[2] See above, p. 25.

equal numbers, of three elements—Government officials, employers and workmen. The composition was as follows :—

Government officials—War Office	2	representatives
Admiralty	2	,,
Board of Trade	2	,,
Home Office	2	,,
Employers	8	,,
Workmen	8	,,

This Committee worked through three sub-committees—for Engineering, Shipbuilding, and Ship-repairing—each composed of four, or three, employers and workmen, together with the Government representatives. The first secretary was Captain Kelly, who was succeeded on 5 June by Captain Ross.

At Glasgow the Committee was unwieldy in size, and the official element was considerably weaker. The full committee consisted of 38 members—16 employers, 16 Trade Union representatives, 4 Government representatives, the Chairman, and the Secretary, Mr. Paterson, of the Labour Exchange organisation. The composition of the sub-committees, however, was more like that of the corresponding bodies at Newcastle. They each consisted of 2 employers, 2 workmen, the Government representatives, and the Secretary.

(*b*) Methods of Effecting the Transfer of Labour.

Alike at Newcastle and at Glasgow, the Committees tried in succession both the possible methods of effecting the redistribution of labour : first, an appeal to the employers to release their men ; later, an appeal to the workmen to volunteer. The results of the two experiments proved instructive, and had an influence on the policy adopted later in the Munitions of War Act. It was found that the second method was considerably more effective than the first, while both yielded better results than Mr. Booth's London Enquiry. The causes of these differences deserve careful attention.

(1) *The Appeal to Employers.*—At Newcastle, the employers had been approached in the first instance, before the Committee was formed, by means of the letter from Lord Kitchener which had also been issued in London, and the corresponding letter and questionnaire from Mr. Booth.[1] The Committee, on 16 April, decided to issue another form, requiring a return from each firm of the labour employed on Government or private contracts, and of the labour required for acceleration of Government work. Later, the firms were asked to telegraph offers of immediate release.

The Manager of the local Labour Exchange was employed to press the firms to make definite offers of release, and then to interview the men offered and ascertain precisely their qualifications. In order to obviate the skilled workman's prejudice against Labour Exchanges, the men were not required to call at the Exchange, and the Manager was instructed to make it clear that he was acting, not in his official

[1] See above, p. 22.

capacity, but as a representative of the Committee. Further, the workmen were informed that their railway fares would be paid from the place of their present employment to the establishment where they were to be engaged on Government work.

It is interesting to compare the preliminary response of the employers at Newcastle with the results of the two similar attempts made in London—the Board of Trade canvass, January 4-23, and the London Enquiry in April.

	Number of firms asked to release men.	Number of men	
		promised for release.	actually transferred.
Newcastle—			
(16-27 April)	300	1,661	—
London—			
Board of Trade (4-23 Jan.) ..	2,619	—	225
Mr. Booth's Enquiry (April–6 May)	405	142	50

It would appear that the readier response at Newcastle was not wholly attributable to differences in local conditions of employment. It may, perhaps, be partly accounted for by the elimination of the Labour Exchange procedure, and by the fact that more pains were taken to approach the men offered for release directly, and not merely through their employers. It may have been due, in a still greater degree, to the weight which the composition of the Committee lent t the appeal. Both employers and workmen were likely to be influenced by the knowledge that their several representatives were endorsing the action of the Government.

The Newcastle Committee, however, were not satisfied with this response. They strained their powers to the extent of issuing a letter calling upon employers to release 25% of their fitters and turners engaged on private work, or to undergo an examination before the Committee upon the reasons of their refusal. Captain Creed and Captain Power wished to go further still, and they applied to the Government for compulsory powers. Captain Kelly also asked for authority to close private workshops, compensation being granted to the employers. About a month later, the Glasgow Committee definitely proposed (among other ways of extending their authority) that the Defence of the Realm (Amendment) No. 2 Act, Section 1 (1) (*d*) should be amended so as to empower, not only the Admiralty and the Army Council, but also their representatives on Armament Committees, to transfer workmen from one establishment to another The refusal of these applications[1] occasioned at Glasgow some loss of prestige to the Committee, which had used a somewhat dictatorial tone towards employers. In both places the Committees had to fall back

[1] Captain Power was, indeed, authorised by the Admiralty to demand the release of men on mercantile work for Admiralty work at Messrs. Palmer's, but it does not appear that any general use was made of such authority.

upon their power of persuasion. They frequently encountered the jealousy felt by the outside employer towards the armament firm. Messrs. Armstrong were accused of squeezing their sub-contractors on Government work, and also of such mismanagement and lack of supervision at Elswick that men were often seen asleep on night shifts.

(2) *The Appeal to Workmen.*—In the hope of obtaining better results, the Newcastle Committee made a fresh start in May, with an appeal addressed directly to workmen, and unanimously endorsed by the trade union representatives on the Committee. They adopted the idea, which had originated in several different quarters,[1] of a "King's Squad or Flying Column of Armament Workers." With the promise that those who enrolled themselves would "earn the same (or more) wages and be under no military restrictions whatever," the Committee called upon workmen to agree to go to any yard or workshop on the N.E. Coast upon receipt of a telegram, stating when and where their services were required. The procedure was simple and direct. The volunteers had only to send in a coupon and act on the telegraphic instructions. Any intervention on the part of employers, Trade Unions, or Labour Exchanges was eliminated until after the man had sent in his name. The employers welcomed the scheme in so far as it saved them from the invidious position of reducing their shareholders' profits by giving up their men; though there was naturally some resistance from their side, justified in certain cases on the ground that the workmen who had volunteered would shortly be required for urgent Government work. Their reluctance was generally overcome by pressure from the Committee. From the point of view of the Government, the scheme had the merit of ruling out any claims for compensation.

The response of the men was excellent, in respect of both numbers and quality. Whereas the employer, when called upon to release men, was inevitably inclined to part with the least skilful and industrious, the class of men who volunteered was so good that comparatively few were rejected by the employers to whom they were sent.[2] It should be mentioned that what had hitherto been, from the workmen's point of view, the principal hindrance to transfer, had been removed, just before the new scheme was launched, by a satisfactory settlement of the vexed question of travelling and subsistence allowances,[3] and a guarantee that "every workman transferred shall receive the same rate, at least, as in his previous employment." The scheme was in force for about six weeks, from 15 May to 30 June. In this period 5,730 men were enrolled, of whom 1,680 were placed. By 16 June, Captain Ross was able to report that the needs of the large firms were nearly satisfied.

---

[1] A somewhat similar proposal is, for instance, put forward in Mr. Allan Smith's programme of 6 April (above, p. 29). At Newcastle the scheme was advocated and carried through by Captain Kelly.

[2] Under the earlier scheme of the appeal to employers, 521 of the 1,738 men enrolled had been rejected by the armament firms.

[3] See below, p. 49.

The following table illustrates the superior success at Newcastle of the appeal to workmen over the appeal to employers. Allowance must, of course, be made for the fact that the earlier scheme prejudiced the later, so that the superiority is even greater than the difference of the figures.

	Men enrolled.	Accepted by employers.
Appeal to employers (15 April to 15 May)	1,738	290 (270)
King's Squad (15 May to 30 June)		
Week ending 22 May	2,575	476
,, ,, 29 ,, ...	1,007	290
,, ,, 5 June	1,086	356
,, ,, 12 ,, ...	491	204
12 June to 30 ,, ...	571	354
TOTALS	5,730	1,680

A War Squad on similar lines was started at Glasgow early in June. In the first four days 4,500 men were enrolled. Half the applicants, however, proved to be unskilled men. By 15 July the enrolments numbered 9,755, but only 1,320 had been offered to employers, and of these no more than 454 had been accepted—a total less than the number placed at Newcastle in the first week.

The success of the King's Squad at Newcastle influenced the Government in framing the War Munitions Volunteer scheme, embodied in the Munitions of War Act. In this scheme, the Squads at Newcastle and Glasgow were merged, with certain concessions to the established functions of the Committees.

(*c*) THE COMPOSITION OF THE COMMITTEES AND THEIR EFFECTIVENESS.

It has been remarked that the success of the Newcastle and Glasgow Armaments Committees was principally due to their composition. This statement evidently requires to be justified in face of the fact that, while both were organised by the same man and were similarly constituted, Newcastle was more successful than Glasgow. Glasgow started later, and could take some advantage of the experience gained at Newcastle. It might, therefore, have been expected to do better, instead of worse.

The available evidence seems to show that the inferior achievement of Glasgow was due to external causes, rather than to any internal weakness of the Committee, though the large size of the full body told against its efficiency. The relations between the various elements represented appear to have been harmonious in both places, and the Glasgow Committee was not less active or enterprising. It may be

conjectured that its comparative failure was chiefly due to the fact that it was working in an atmosphere vitiated by bad relations between Capital and Labour. From February, 1915, onwards, the unrest and discontent on the Clyde were, both in degree and in kind, exceptional. The rather autocratic attitude assumed by the Committee, and its application for drastic powers of compulsion, were, perhaps, a consequence of this tension.

The principle of the Newcastle Committee's composition was determined primarily by a desire to remedy the conflict of interests and overlapping of activities which had been the subject of much complaint in the district. Different Government Departments had independently called for elaborate returns, now from the employers, now from the Trade Unions; the Admiralty and the War Office, in competition with one another, had tried to attract men to Government work; the Recruiting Officer was still enlisting skilled men for the Army; the employers' interests conflicted with them all; and the workmen, even apart from considerations of their personal advantage, might well be in doubt to which of these many voices they ought to give ear. In the earlier days of the War, the employers had met the workmen on the old battle-ground of joint conferences, where the public interest was apt to be forgotten, because in normal times it had never been considered. The struggle between Departments, in so far as any attempt had been made to allay it, had been dealt with, not on the spot, but at headquarters, by the necessarily slow, and often ineffective, diplomacies of Whitehall. The best, perhaps the only, chance of adjustment and reconciliation lay in the creation of a local body, acquainted with the peculiar needs and problems of a single district, which could meet round a table to discuss ways and means to a common purpose of national significance, and not identical with the separate aims of any one section.

The presence of the Government representatives proved to be of value in several ways. It necessarily brought about a compromise between the competing claims of naval and armament work, and held the recruiting officer in check. The representatives of the several Departments, with a knowledge of rival needs and of local conditions, were in a position to formulate definite requests to their superiors in London, and to press for the solution of limited problems. In the district itself, their presence was felt outside the Committee, because, though not themselves armed with the powers of the Defence of the Realm Act, they were outposts of the central authorities who held those powers in reserve. Inside the Committee, their influence was still more important. Confronted with employers and workmen, they stood collectively for the public interests of the country, and helped to keep the proceedings from lapsing to the level of industrial disputes.

It would not be fair to ascribe exclusively to this influence the cordial relations which existed, alike at Newcastle and at Glasgow, between the employers' and workmen's representatives. In this respect the success of the experiment surpassed expectations. From the outset, it was agreed at Newcastle that employers and men should not be ranged on opposite sides of the table; and it was found that on

no single issue were they divided by a straight vote. Captain Kelly reported that the Committee, as a whole, was "surprisingly in accord on controversial points." Mr. Hebron, one of the workmen's representatives, said after the dissolution of the Committee: "Confidence between the employers' section and ourselves was growing, mutual understandings were developing, and many positions were adjusted with a maximum of satisfaction and a minimum of friction."

This mutual confidence was strikingly exemplified when, on the issue of an old-standing controversy between the two parties, the men left the statement of their case before Mr. Booth's Committee to a deputation consisting entirely of employers. The matter in question was the travelling or subsistence allowance. The settlement of it deserves more than a passing mention, since it illustrates, under several aspects, the strength and effectiveness of a committee so composed.

(*d*) Travelling and Subsistence Allowances.

The dispute between employers and workmen over the question of these allowances dated from the beginning of the War.[1] With regard to the terms offered to labour transferred during the emergency of mobilisation, there had been a difference of practice between the War Office and the Admiralty. In both cases, it had been intended that the subsistence allowance should be only temporary. The War Office, whose plans had been laid in view of the mobilisation of the Expeditionary Force, were able to cease paying the allowance after six weeks. The Admiralty, on the other hand, had to reckon with an emergency to which no term could be set. At any moment, after a naval action, there might be large and urgent demands for ship-repairing labour at any of the North Sea ports. They had, accordingly, offered £1 a week for at least three months; and at the end of this period had continued the allowance, though the bonus was withdrawn.

All the men brought from a distance, whether for the War Office or for the Admiralty, had been taken through the Labour Exchanges. This method obviated any chance of conflict between men coming from other districts on their own initiative and men brought by a Government agency. It did not, however, prevent trouble arising between the imported men and the local workmen, who, of course, did not receive the subsistence allowance or the bonus, and were disposed to agitate for a corresponding increase of their own wages.

The second stage was marked by the joint conferences of employers and workmen held in the winter months of 1914. The employers were then demanding more men both for naval and for private work, and the suspension of demarcation rules. The men replied that plenty of men could be obtained, without a sacrifice of Trade Unions customs, if the employers would offer the Admiralty terms. The established peace-time methods of conducting an industrial dispute were brought into play—proposals and counter-proposals, and a leisurely inter-

[1] See Part II., Chap. II., Section VI.

change of correspondence, of a more and more acrimonious tone, between Federations and Unions. Dr. Macnamara's intervention on 15 December resulted in nothing more than a formulation of the opposing views. Neither side would give way, and the matter came to a deadlock.

In February, the controversy passed into the third normal phase, when the Chief Industrial Commissioner and his colleagues of the Committee on Production attempted the method of conciliation. The proceedings opened with the ill-omened refusal of the Employers' Federation to meet the Unions in presence of the Committee. The employers represented that, if they offered the Admiralty terms, it would cause a "general post" of labour. Large numbers of men would gain, merely by removal to another district, an increase of £1 in wages, while there would be no increase of output. All efforts to settle the question broke down, and the Committee on Production was unable to make any recommendation to the Government on this subject.

In this position the matter rested until it was taken up by the Newcastle Committee in April, though by this time some of the large shipbuilding firms had begun to pay allowances. On 23 April, the Committee resolved that men transferred from a distance to Government work should receive either (1) a subsistence allowance, or (2) workmen's fares both ways, together with one hour's travelling time daily at overtime rates. The Government Departments concerned were to be pressed for a speedy decision.

On 29 April, the Secretary reported that the War Office had ruled that subsistence allowance would not be paid by the Government, and had requested the Committee not to take any action that might prejudice the Government in other districts. This brought the Committee's work to a standstill. The local representative of the Amalgamated Society of Engineers maintained that the decision contravened an agreement between Lord Kitchener and his Society that transfers were to be made without infringing trade union rules.

At this juncture, the value of the new machinery was proved. The strength of the local Committee lay in the unanimity of all the three elements in its composition; for it was on this occasion that the workmen left the statement of the whole case to a deputation of three employers. The Government officials, the employers, and the trade unionists on the spot had been able to thresh out the question and to reach an agreement satisfactory to them all. They had, moreover, in the Armaments Output Committee, a body which would listen to them sympathetically, and was equally anxious to force a way through obstacles. This Committee, when it met the deputation on 30 April, accepted the principle that subsistence or travelling allowances should be paid by the Government Departments concerned.

The workmen's representatives at Newcastle also conferred with Mr. Mosses and Mr. Hill of the National Advisory Committee,

on 4 May.[1] They pointed out that workmen and employers were in complete agreement, and merely wanted to maintain local working rules which had been applied to the district for thirty years past.

In the Admiralty representative, the Newcastle Committee had yet another point of immediate contact with the central Government. On 24 April, Captain Power interviewed Sir Frederick Black, who undertook to raise the question on the Munitions of War Committee. The upshot was that this body, on 7 May, endorsed the conclusion of Mr. Booth's Committee that the allowances should be paid by the Government. Five days later, a code of Rules for the transference of men in the North-East Coast district, submitted by Sir Percy Girouard, was approved by the Munitions of War Committee. The same rules were afterwards adopted at Glasgow.[2]

By these means, in less than three weeks, a question which had defied solution under the normal procedure for many months, was settled to the complete satisfaction of all the parties represented in the local organisation.[3]

(*e*) The Tendency of the Committees to enlarge their Activities.

The original purpose for which the Committees at Newcastle and Glasgow were appointed was essentially of a temporary nature. As soon as the needs of the important firms were satisfied, the task of redistributing labour naturally ceased. In the course of July, the weekly numbers of men accepted by employers at Newcastle under the War Munitions Volunteers scheme fell from 416 to 22, and the end seemed to be in sight. At Glasgow, as has been seen, the movement had never had much success. Neither Committee, however, showed any inclination to dissolve itself. Their tendency rather was to seek an enlargement of their functions and a permanent existence. In May and June they were already developing in two directions.

In the first place, as the movement for the concentration of labour approached its natural limit, the Committees began to interest themselves in the reverse movement for the distribution of work. This involved the invasion of the A Area by the other principle of local organisation, which had at first been rigidly confined by the War Office rule to B Areas. The Newcastle Committee had from the first received and registered offers and applications of all kinds from firms or

---

[1] L.E. 1965/221.

[2] The travelling and subsistence allowances were later incorporated as an essential feature in the War Munition Volunteer scheme.

[3] It is a curious fact that, throughout these negotiations, no reference appears to have been made to a pledge given by Mr. Lloyd George on 10 March in the House of Commons: "The hon. Member (Mr. Tyson Wilson) is concerned about workmen who are transferred, under the Bill, from one district to another. The Government are quite prepared to meet the point of my honourable friend by dealing with it on exactly the same basis as they now deal with workmen who are transferred from the Dockyards." (*Parliamentary Debates* (1915), *H. of C.*, LXX., 1459.) In spirit, though not in letter, this pledge appears to be relevant.

individuals who desired to help in the output of munitions. As early as 26 April, when the War Office rule protecting A Areas from the placing of new contracts had broken down, two members of the Committee declared themselves in favour of distributing work rather than concentrating labour; but the original policy was pursued till there was little more to be done in the way of labour transfer. In June, the Committee were considering schemes for co-operative production within their sphere of influence. This development was cut short by the re-division of the country into large Areas after the formation of the Ministry.

In the second place, thanks to the influence which their composition and internal cohesion won for them in the district, the Committees began, almost from the first, to be looked to as authorities exercising a general supervision over labour questions throughout their areas. At Newcastle, the Committee was called upon by the local Press and by a trade union to take up the defence of the shipyard workmen, when the Federated Shipbuilders accused them of loss of time due to drink, and they conferred on this subject with the Central Board for Liquor Control and with the local authorities. They endeavoured to secure the observance of the Treasury Agreement. They took up questions of railway and tramway services, and co-operated with the local Housing Committee. They took action to check bad time-keeping, prohibited local race meetings,[1] and tried to suppress the Whitsuntide holiday. The Glasgow Committee was equally active in similar ways.

More important than any of these activities was the use made of the Committee as a court of appeal to settle trade disputes. In several cases, Captain Power or Captain Kelly, at the Committee's request, intervened personally with success; in other instances disputes were brought before the Committee as a whole, and its decisions were generally accepted.

Encouraged by its success in this sphere, the employers' representatives on the Newcastle Committee resolved that Armaments Committees should be empowered to settle trade disputes on munitions work. The Glasgow Committee had made the same request in May, as part of a larger scheme for the extension of their functions. Besides the settlement of differences, they had applied for authority to remove demarcations which hampered output; to summon before them employers, trade union officials, and others, and compel them to observe the instructions of the Government representatives; to transfer workmen compulsorily; and to draw labour from other districts.

Both Committees were informed that only the Cabinet could confer such powers; and their requests were not in fact granted. Sir George Askwith strongly opposed the claim for powers to settle disputes. He considered that the workmen would object to their grievances being settled by members of other trade unions, while employers would not be willing to go before a tribunal of which (as he said) half was frankly

[1] Captain Ross notes that this was the first action of the kind to be taken anywhere.

partisan, and the other half would not take a strong line for fear of reprisals.

It may be questioned whether this forecast was justified by the events. Sir George Askwith seems to have overlooked the fact that the Committees were not composed only of employers and workmen in equal numbers—a type of body which is open to the serious objections he put forward. The moderating influence of the one-third consisting of impartial Government representatives appears in fact to have been felt on these occasions. If the first application had been made, not from Glasgow, but from Newcastle, and made three months later, when the Committee could have pointed to a series of successful interventions, Sir George Askwith's judgment might have been modified. On the other hand, it must be borne in mind that, so long as the Committee had no compulsory powers and merely gave its services when they were voluntarily invited, the chances of conciliation were considerably greater than they would have been if it had been empowered to summon the disputants and to enforce its awards upon unwilling parties. Its increasing popularity as a court of appeal depended largely on the fact that, while both sides were sure of a fair hearing, the losing side went away without a grievance.

The two Committees continued in being until they were superseded by the new Area Organisation instituted by the Ministry in August, 1915. Several members of the Newcastle Committee protested strongly against the shelving of a body which had acquired a valuable fund of local experience, and settled down into harmonious relations, both internal and external. They objected to the executive powers being entrusted to three officials. The Labour members were reluctant to remain on a committee reduced to advisory functions, and their dissatisfaction was strongly expressed at the final meeting on 30 August.

IV. The Breaking down of the Distinction between A and B Areas.

No other Armaments Committees on the Newcastle model were formed in the remaining A Areas, though early in April it was proposed to treat on the same lines the districts surrounding Barrow, Coventry Ordnance, and the Birmingham Small Arms Co., while London was being dealt with by the methods of the enquiry already described. The principal reason why the system was not extended was that the whole scheme for mutually exclusive A and B Areas was abandoned about 20 April under the influence of Sir Percy Girouard. But even before this date it had become clear that the ring-fence set up round the A Area by the War Office rule of the twenty-mile radius could not be rigidly maintained.

The reason will be evident from a consideration of the following table. The first column shows the Royal Factories and armament firms on the War Office list,[1] grouped according to their localities.

[1] See list prepared on 29 March, 1915, Appendix X.

The second column gives the centres of the corresponding A Areas which would result from an application of the War Office rule.[1]

Factories and Firms.	*A Areas.*
Woolwich Arsenal	1. London
Royal Factory, Enfield	
Vickers, Crayford and Erith	
Projectile Co., Battersea	
London Small Arms, London, E.	
Vickers, Ipswich	2. Ipswich
Vickers, Electric & Ordnance Accessories Co.	3. Birmingham
Birmingham Small Arms Co.	
King's Norton Metal Co.	
Birmingham Metal & Munitions Co.	
Coventry Ordnance	4. Coventry
Armstrong's, Openshaw	5. Manchester
Vickers, Sheffield	6. Sheffield
Firth ,,	
Hadfield ,,	
Vickers, Barrow	7. Barrow
Armstrong's, Elswick	8. Newcastle
Armstrong's, Darlington	9. Darlington
Royal Factory, Greenock	10. Glasgow
Beardmore, Dalmuir and Parkhead	
Armstrong's, Alexandria	
Cammell, Laird, Birkenhead	11. Liverpool
Dick, Kerr, Preston	12. Preston
Greenwood & Batley, Leeds	13. Leeds.

It is immediately obvious that these Areas included a very large proportion of any surplus engineering capacity that could be drawn upon for shell manufacture. Circles of twenty-mile radius drawn round two of these centres alone—Manchester and Leeds—contain nearly all the important towns in Lancashire and West Yorkshire: Keighley, Bradford, Halifax, Wakefield, Huddersfield, Barnsley, Bury, Rochdale, Rawtenstall and Bacup (at each of which a Board of Management was set up before the end of 1915), as well as places of minor importance for this purpose, such as Brighouse, Accrington, Bolton, Oldham, Wigan, Warrington, Stalybridge, Burnley.[2] What is left of Lancashire and the West Riding is completely covered by the Areas round Barrow, Preston, Liverpool and Sheffield. If the War Office rule had been strictly applied, there would have been little room left for co-operative schemes, except in South Wales, the Bristol district, and a few outlying centres in the Midlands.

A further difficulty was that eight of the centres on the A Area list—Liverpool, Manchester, Glasgow, Leeds, Coventry, Sheffield, Birmingham and London—were precisely the places at which the Board of Trade, with the approval and co-operation of the War Office, had held the exhibitions of sample shells and fuses, and was at this very time engaged in inspecting the works of firms who desired to

[1] The first 10 of these Areas appear on a provisional list of A Areas drawn up at the beginning of April; and of the remaining three, Leeds, at any rate, was at first regarded as coming under the rule.

[2] At all these places Affiliated Munitions Committees were subsequently set up.

tender for contracts, either singly or in groups. At several of these places the employers were already forming committees, and eager to take immediate action. The Board of Trade was deeply committed, and almost the whole of their work was threatened with stultification. On 8 April, when the Board reported progress to Mr. Booth, they had to point out that the groups which were being arranged at Rotherham, Sheffield, Bradford, Keighley and Leeds all fell under the ban, as well as a number of textile machinery firms at Manchester. The only other groups existing or in prospect at that date were at Leicester, Hull and Lincoln. The Board also furnished at the same time a list of 40 selected firms, of whom the majority offered to machine either 18-pdr. or 4·5-in. shells, while 15 were prepared to make fuses, and four offered forgings. A considerable proportion of these were situated in protected areas. It soon became apparent that the concession obtained from the War Office hardly deserved to be called a compromise. The field it left open to the B Area principle promised only a negligible amount of capacity.

The two policies were, indeed, still unreconciled in practice. The clash between them may be illustrated by the case of Birmingham. Here the local Chamber of Commerce, acting on the suggestion of the Labour Exchange Divisional Officer, had called a meeting, on 7 April, of engineering employers who desired to take up armament work. Several representatives proposed that a group should be formed for co-operative shell production. The idea was opposed by Major-General Mahon, who addressed the meeting on behalf of the War Office. He is reported to have said that the existing sources of munitions supply were sufficient for all purposes, provided that labour to operate the machines could be obtained. He thought it practically impossible to set up, in time to be of service, fresh centres for shell manufacture. After consideration, he had come to the conclusion that the only way of securing improvement was to form a Labour Battalion, which might be sent, as required, to help the armament firms.[1]

This proposal met with no support from the firms' representatives, who had come quite unprepared for the official discouragement of their scheme. Major-General Mahon, in his own report to the Master-General of the Ordnance, wrote :—" So far as my particular object of trying to get assistance to bring together a body of independent labour is concerned, my visit (to Birmingham) is a complete failure. Every man argues that he wants labour and can spare none."[2]

The Divisional Officer was naturally distressed at the apparently hostile attitude of the War Office towards the system of co-operative groups, which had been in the minds of the promoters of the meeting. On 10 April, when his report of the meeting had been received, an officer of the Board of Trade saw Major-General Mahon and ventured upon a remonstrance, which proved effective. Major-General Mahon said that he was not so absolutely opposed to the group system as the

[1] Report of Divisional Officer for West Midlands. L.E. 1965/144.
[2] 94/GEN. No./92.

Divisional Officer's report suggested. It might, he admitted, be necessary to approach Birmingham with both possibilities in view.

The advantage so gained was immediately followed up. On 13 April Mr. Booth received representatives from Birmingham, and proposed that contracts should be placed either with a group or with individual firms. It was arranged that a meeting should be called at Birmingham to formulate proposals, and a committee was elected there on 19 April.

It does not appear whether the War Office ever formally withdrew the rule of the twenty-mile radius. But, as the pressure from other centres in the reserved areas became stronger, it soon ceased to be in force. On 16 April Major-General Mahon and Mr. Hanson themselves received a deputation of textile machinery firms from Manchester, and informed them that 12,000 4·5-in. shells would be a sufficient contribution from the textile firms of Lancashire. On the same day, Mr. Davison was able to report that " A Areas, namely 20 miles round armament towns, are no longer regarded as districts in which fresh orders for shells must not be placed."[1]

So, at last, the Board of Trade won back the lost ground, though in the meantime progress had been delayed. For instance, the Sheffield Committee, appointed on 29 March, had been told to suspend its operations except in so far as it could help with labour supply ; and other nascent groups were similarly held in arrest. The barriers were not finally swept away until Sir Percy Girouard's new scheme abolished the distinction between the two types of area.

V. The Development of Co-operative Schemes in B Areas.

In considering the earliest dealings of the Armaments Output Committee with the B Areas, it is important to realise that, although the programme of 6 April above described had on paper a formidable air, the designs of Mr. Booth and Mr. Allan Smith were not really on a very ambitious scale. Apart from the small volume of engineering capacity that was to be found outside the A Areas, there are other limitations to be noticed.

Like the Board of Trade exhibitions, the Committee's operations were confined to the smaller natures of high explosive shell (in particular the 18-pdr., 4·5-in. and 6-in.) and the No. 100 fuse. No other warlike stores came within their commission. Nor were they at first expected to take up the problems of the supply of machinery or of raw materials, though at a very early stage of their enquiries these questions were forced upon their attention. Their first object was to turn to account the resources brought to light by the sample exhibitions and subsequent

[1] *Report on Co-operation with Mr. Booth and Lord Kitchener's Committee* (16/4/15). HIST. REC./R/171/17.

inspections. As the reports of the survey were received at the Board of Trade, each firm was entered on a table showing the numbers employed and the proportion of employees engaged on Government work, with a general indication of the firm's capacity for shell and fuse manufacture. Tabulations were also submitted, giving the firms or groups of firms which appeared from the survey to be specially adapted for the purpose and to merit consideration for orders.[1] The function of the Committee was to assist the Contracts department by carrying negotiations with these possible contractors up to the point at which they could make a definite offer of so many hundred shells or fuses a week. The order once placed, the Committee, like the Contracts department in normal times, was not expected to concern itself further with the means and methods by which it would be executed.

The main principle involved was to substitute the placing of direct contracts for complete articles for the old system under which the manufacturers had taken from the armament firms sub-contracts for single processes. The group was simply a composite contractor, a federation consisting of such a number of firms as together, though not individually, possessed the plant required to turn out the forging and machine the empty shell. Such now seemed to be the best method of setting the smaller engineering firms to work.

Mr. Booth was reluctant to put into force the coercive powers obtained under the Defence of the Realm Act. In his letter to employers of 29 March[2] he had stated that the War Office, while prepared, if necessary, to use those powers, was "anxious to disturb employers as little as possible." On 20 April he remarked to a deputation of the Birmingham Committee: "We are very anxious that in no sense should any of these new measures involve compulsion upon anybody. We do not want to adopt violent measures under the Defence of the Realm Act, such as winding up people's shops and taking over the control of them. Our firm belief is that the country will run itself extremely well if it only gets the chance."

There was, indeed, at first some intention of enforcing the Act upon firms in the A Areas, a field in which the application of its provisions, as a means to the diversion of labour, would have been appropriate. But, as the distinction between A and B Areas broke down, the idea, underlying the Act, of the compulsory extinction of commercial work by depopulating or dismantling factories or by "taking them over," faded into the background, where it remained as a bugbear to overawe the recalcitrant employer. In the main, however, employers were anything but recalcitrant, as soon as they were able to obtain a sympathetic hearing of their case at interviews with the Committee, and to formulate proposals compatible with their reasonable interests.

The position, as it appeared to the manager of an important engineering concern of medium size, was stated by Mr. Pybus,

[1] L.E. 1965/161. [2] See Appendix VI.

managing director of the Phoenix Dynamo Company at Bradford, in a reasoned and comprehensive memorandum.[1] The writer pointed out the obstacles which, in districts such as Yorkshire and Lancashire, blocked the A Area policy of concentrating labour. A workman of the best type would not move, even for higher wages, to employment at an armament firm in a congested area. His family, some of whom would be working in mills or factories, could neither find occupation in the new place nor earn enough to live on at home in the man's absence. Men who had left their homes to go to armament districts, had returned disgusted with the high cost of living and the wretched housing conditions, and had deterred others from going. A maximum output from the existing shell-making tools, and particularly from those now on order for the great armament firms, could be obtained only by moving them to the districts where labour was to be found. The railway congestion in armament centres was a further ground for the same conclusion.

There were many objections to the system of sub-contracting. The waste of time and money involved in sub-letting operations on shells to medium-sized firms was illustrated by one instance, which entailed (1) the raw material being sent from the armament works to the sub-contractor for boring and turning; (2) the rough-turned shell being sent back for the pressing up of the nose; (3) the shell being returned to the sub-contractor for partial completion; and (4) finally sent back to the armament firm for finishing. The output under such conditions must obviously be much smaller than it would be if certain key operations, now only done at armament works, could be performed at a central depôt. Further, every department of a well organised factory being interdependent on the others, the whole output would be stagnated, if the full capacity of the one class of tools suitable for armament work were monopolised for that purpose. The work handed out to sub-contractors was of far too limited a range.

Mr. Pybus recommended the grouping of medium-sized firms. For every very large engineering concern in England, there were perhaps ten such firms employing 500 or 600 hands and with an equally good tool equipment. They were usually very efficient. The concern, as a rule, had not passed out of the control of the people who had built it up, and friendly relations between employer and workmen increased output and reduced working costs. The percentage profit was invariably greater than that of the larger firm, though the selling price was commonly less. The percentage efficiency per man and tool must therefore be greater.

The method of organisation recommended by Mr. Pybus was practically that which, shortly after the date of his memorandum, was adopted at Leicester. The functions which he suggested should be exercised by a Board of Control, consisting of one Government

[1] M.C. 414. This memorandum was sent by Mr. Pybus to the Treasury on 18 March, and a copy was forwarded by the Board of Trade to Mr. Booth on 31 March.

representative and one representative of each of the co-operating firms, closely resembled the duties later undertaken by the "Board of Management."

Referring to this memorandum in a letter of 5 April to Sir H. Llewellyn Smith, Mr. Booth observed that the writer was very intelligent, and that he was "crystallising in his direction."

Meanwhile, Mr. Allan Smith was setting to work on somewhat different lines. It will be remembered that, in his programme of 6 April, he proposed that the Engineering Employers' Federation should move their local Associations to appoint committees, representing the various branches of industry carried on in the district. These local committees were to have functions different from those of Mr. Pybus' Board of Control. They were not to undertake to execute a contract, but to be available for consultation, to superintend the carrying out of the Central Committee's instructions, and generally to assist in matters referred to them and make suggestions.

Mr. Allan Smith interpreted Lord Kitchener's approval of his memorandum as a commission to take action on these lines through his Federation. The result was that some overlapping occurred at several places, where the Board of Trade was simultaneously organising a committee of the group type. At Leeds, for instance, the first move was made by a deputation of the Engineering Employers' Federation which interviewed the Master-General of the Ordnance on 24 March. They proposed that a central committee of five members of the Federation should be notified by the War Office of any orders that required to be placed, and should hand on the orders to branch committees in localities they thought suitable. On 13 April, the Leeds Engineering Employers' Association appointed the four members of this deputation with one other gentleman a special local committee to deal with the question of munitions production in the Leeds district. On the same day, the Lord Mayor, at the instance of the Labour Exchange officials, issued an invitation to Leeds engineers to meet and consider proposals on co-operative lines. When the meeting was held two days later, the conflict was adjusted by confirming the appointment of the Association's Committee. This Committee saw Mr. Booth at the War Office on 19 April and adopted the co-operative system.

The Federation took similar action at Birmingham, through Mr. Arthur Keen and Captain Hilton; at Coventry, through Mr. Alfred Herbert; at Oldham, through the Manager of Messrs. Asa Lees; and at Sheffield, through Colonel Hughes. Sir Algernon Firth also set in motion the Chambers of Commerce; but these bodies in most cases made way for the local Engineering Employers' Association, as being an organisation better suited to the purpose. The scheme propounded by Captain Hilton at Birmingham on 11 April was on Mr. Allan Smith's lines. He recommended that the War Office should appoint five Birmingham employers and a War Office official to act for the Department in the district. This committee was to fix prices,

issue orders, organise the trades, advise the Armaments Output Committee on labour supply and transfer, and commandeer the output of certain works. The general result, however, was that the co-operative system prevailed, and the machinery of the Engineering Employers' Federation was not adopted as the framework of organisation.

Partly as a consequence of the War Office rule which excluded the co-operative principle from those areas where engineering centres are thickly clustered, the natural geographical unit was at first the town, rather than the larger district. In a place like Leicester, Nottingham, Lincoln, or Hull, a group would be formed by a number of firms, well known to one another and accustomed to mutual dealings, coming together to arrange for co-operation. Four or five members of the principal firms would be formed into an executive. The available surplus of capacity would be represented by a small fraction of machinery and men not already absorbed by Government work; and an output of 500 or 1,000 shells a week was the most that any of the earliest groups could contemplate at the start.

On 16 April, when Mr. Davison reported on co-operation between the Board of Trade and the Armaments Output Committee, it had been arranged that Mr. Booth should interview, in the course of the next few days, representatives of groups which were being worked up by the Labour Exchange organisation at Walthamstow, Bradford, Leeds, Keighley, Nottingham, Hull, Wakefield, and Rotherham. Other places that have been mentioned were in various stages of advance. The only order that had actually been placed was at Leicester.

If the Armaments Output Committee had continued on these lines, its work might have reached a natural termination in two or three months. By that time, the new contractors would have been organised, the orders placed, and the work begun. The Contracts department could then have dealt with them through the established routine. It was not long, however, before a much wider prospect opened out before the Committee. In the last ten days of April, the whole plan of operations was remodelled, and the Committee began to assume the functions, and acquire something of the status, of a Department.

CHAPTER IV.

LOCAL ORGANISATION, 28 APRIL TO 26 MAY.

I. Sir Percy Girouard's Scheme for Co-ordinating A and B Areas, and for a Central Department.

About the middle of April, Lord Kitchener sent for Sir Percy Girouard and requested him to advise him personally, in conjunction with Mr. Booth, on the output of munitions.[1] Sir Percy Girouard came to the War Office shortly before 20 April, and resigned his managing directorship at Elswick on 22 April.

Mr. Lloyd George immediately invited him to lay his views before the Munitions of War Committee. He was co-opted to that body on 26 April, and at the same meeting he presented a *Memorandum on the Production of Ammunition*,[2] which he had drawn up in collaboration with Mr. Booth. This document contained far-reaching proposals both for the reconstruction of the whole scheme of local organisation and for enlarging the functions of the central body.

(*a*) In the sphere of local organisation, Sir Percy Girouard attacked the principle of dividing the country into A and B Areas, and the attempt to organise fresh centres of shell production in Areas of the latter type independently of the former. The Government was at present relying for its home supplies entirely upon A Areas. Deliveries were considerably in arrear, but the new equipment of the armament firms was nearing completion and the maximum weekly output promised might be expected in from three to five months, provided that the necessary supplies of labour, machinery, and material were not interfered with. Such interference, however, was threatened by the independent development of B Areas ; the increase of labour demanded by the armament firms would be withheld, and large numbers of skilled men would actually be withdrawn from the most efficient section of our supply. Hitherto, at Newcastle, for instance, labour had been drawn in from the neighbourhood. At Messrs. Armstrong's shell factories the staff had risen from 1,300 to 13,000. But, if independent B Areas were constituted near Newcastle, a proportion of workpeople would be attracted away. There would also be a danger of interference with contracts for machinery or raw material already placed by armament firms for the completion of their works or the

[1] As early as September, 1914, Captain Hankey, Secretary of the Committee of Imperial Defence, had suggested to Mr. Churchill that Sir Percy Girouard should be put at the head of an "emergency armament multiplication committee or department, to set on foot and develop the maximum possible output of guns, rifles, ammunition, etc." Hist. Rec./R/170/21.

[2] M.C. 8. Hist. Rec./R/172/1. (23 April, 1915.)

maintenance of their full output. The result would be a diminution of supply, and this must, at all hazards, be avoided.

A further objection was that B Areas, acting independently, would have to face serious experimental difficulties, and could hardly achieve success rapidly unless some central supervision were provided, to guide every operation.

These objections appeared insuperable, and the writer concluded that the two types of Area must be co-ordinated.

In order to provide technical supervision for the co-ordinated Areas, it was recommended that the Government should assume control (nominal in so far as management was concerned) of ammunition factories. The heads of the ammunition departments of the principal armament manufacturers were to be withdrawn from the employment of their firms and taken into temporary public service as Government Superintendents. Besides continuing to control the factories of their companies, they would become supervisors or guides in organising the companies of the so-called B Areas.

The general line of procedure to be adopted would be as follows. Assuming the county as the unit (though this might prove not to be the best unit) the first step would be to form a Committee, whose members would be drawn from the many manufacturing centres which had already sent deputations to the War Office. The new Committee, say in Yorkshire, would be put in touch with the manager of Armstrong's shell factories, now appointed to be a Government Superintendent of Munitions. After visiting the shell shops, they would return to their county to consider the class of work that could best be done in their factories. The ideal to be borne in mind was that each district, or county, or town, which took up the manufacture of ammunition, must be prepared to deliver complete rounds (without propellant or explosives); though in certain instances the fuses made in one area might be balanced against the shell or case made in another. The Committee, having thus mapped out the work with the help of the Superintendent, would then nominate managers from the various works to act under the Superintendent and keep the whole area in touch with him.

In order to avoid robbing the armament firms of skilled hands to start the new work, a nucleus of managers, foremen, and skilled workmen should be sent from each factory to be trained at a regular armament works. On their return they would proceed rapidly with the knowledge so acquired. The necessary supply of gauges and tools would be organised, under the Superintendent's direction, so as not to interfere with contracts already placed.

When the Committee could arrive at an estimate of the total output of their district, they would report it to the "central executive or department." The writer believed that, organised in this way, the United Kingdom could yield an output which, supplemented by supplies from the rest of the Empire, would make the country independent of foreign contracts.

(*b*) On the subject of the "central executive or department" Sir Percy Girouard did not enter into details; but it is clear that this body was to be both more important and more independent than the Armaments Output Committee. He stated that, in requesting him to appear before the Munitions of War Committee, Mr. Lloyd George had "given him, as a guiding principle, the creation of an organisation in England and the Empire which would fully provide for ammunition requirements, and lead, if possible, to an immediate increase of output." Sir Percy Girouard considered that a "special department" should be organised, which, it was suggested, should "control the whole of our Imperial output." In relation to the local bodies, its function would be to report to the War Office and the Admiralty the offers of prospective output made by the several districts, and to ask for the allocation of these supplies and the distribution of contracts by the usual departments.

The most characteristic feature of Sir Percy Girouard's scheme is the proposed grouping of the new direct contractors under the tutelage and supervision of the Government Superintendent, drawn from the armament firm. In this respect the plan was never put into practice; indeed, its author had already modified his views before he met the Munitions of War Committee on 26 April, and had come to prefer the method of founding Government factories of a new type.[1] On the other hand, it will be seen that the memorandum summarised above entailed a radical change of policy, and established both the central and the local organisation on a fresh basis. It will be convenient to consider first the new pattern of local organisation, and afterwards to describe the consequential development of the central committee. The bare statement contained in the memorandum can be supplemented from expositions of the scheme given by Mr. Booth and Mr. Allan Smith at a series of conferences with deputations from local committees, held almost daily from 20 April to 29 April.[2] Mr. Booth had spent the whole morning of 20 April with Sir Percy Girouard, and from that time he threw all his energies into the development of the new plan.

II. The Armament Firms and the Minor Contractors.

The negative result established by Sir Percy Girouard's proposals was the total and final abandonment of the distinct A and B Areas which had been the essence of the compromise between the Board of Trade and the War Office. From 20 April onwards, except at Newcastle and Glasgow, where the two Armaments Committees of the A type went on with their work, the terms "A Area" and "B Area" ceased to have any application. This change was no question of mere administrative expediency; it implied an inroad upon the last defences guarding the privileged position of the armament firm.

[1] See below, p. 70.

[2] Printed verbatim reports of these Conferences are in HIST. REC./R/171.

As managing director of Elswick, Sir Percy Girouard naturally approached the whole problem from the armament firm's point of view, and, as will be seen later, his experience enabled him to put his finger on several weak spots in the earlier scheme. His first commission from Lord Kitchener had been to secure the concentration of labour within the Newcastle district upon Messrs. Armstrong's works; and in his report to the Master-General of the Ordnance, dated 25 March, he had emphasised the primary necessity of manning the factories laid down by Government under the control of the original manufacturers of munitions of war. To attempt to organise small engineering concerns, in preference to the main factories and at the cost of depleting the competent firms of their supervision, would, he had declared, be suicidal; though some of the small factories, if almost wholly remodelled, might be organised later. The type of central authority proposed in this report was designed solely to effect the transfer of labour, by correlating the efforts made in the various districts on the lines of his own work at Newcastle. At this date, in fact, Sir Percy Girouard had been, almost without reserve, a supporter of the old War Office policy.

In the first three weeks of April, however, the situation had changed. At Newcastle, the local Committee was beginning to satisfy the immediate labour requirements of the principal Government contractors; and on the other hand, the Board of Trade and the Armaments Output Committee had pushed forward their work in the B centres to such a point that the claims of this alternative policy could no longer be denied. It has already been pointed out that by 16 April the whole principle of the reserved A Area had broken down.[1] The armament firms were no longer to be protected from the placing of direct contracts in their vicinity.

This really meant a complete reversal of the policy, which had ruled at the War Office since October, 1914, of extending the system of sub-contracting. At the conferences in the last ten days of April, Mr. Booth was explicit on this point. Addressing the Bradford Group on 23 April, he said[2]:—

> "All further sub-contracting through the main armament firms is going to come to an end as far as possible, and to be replaced by direct Government work. The whole producing areas are coming under Government work, including the armament areas themselves. Everybody would have their own contracts: each district would have its own contract, just as the armament areas have their contracts; so there would be direct touch between the War Office and them."

Again, the following passage occurred at the interview with the Rotherham deputation on 27 April[3]:—

> MR. WELLS (of E. Allen & Co., Tinsley): "There has been a disposition on the part of Rotherham to assist these large armament firms in turning their shells. I investigated that

[1] See p. 53.
[2] A.O.C. *Printed Minutes*, p. 72. HIST. REC./R/1711.
[3] *Ibid.*, p. 104.

problem thoroughly ; and it appears to me that these large armament firms, in the rates they are paying, are taking the last drop of financial blood from these small contractors."

MR. BOOTH : " There will be no more of that, because it will be arranged through the districts now entirely, and, if we find that there is any question of difficulty, the Government will deal with it on their own account. It may be wiser to let the Government actually do it, though it will be managed by a big local committee. We want to have no one feeling that they are piling up profits for a particular firm. That does not suit anyone. It does not suit the political side of the Government, and it is a very important thing to a man like the Chancellor of the Exchequer, who is having that in hand all the time ; and it does not suit the Labour Party. The armament firms are playing cricket. They are coming in, and they say : ' We do not want any more sub-contracts. Take the whole thing over and run it any way you like ; take our shop and our management over as you like.' Certainly, if any group is asked to help in any way—and your group will be asked to help—you will not be allowed to lose the full credit, the full advantage of the work you have done. There will not be that centralising of huge armament profits for three or four firms that you are thinking of."[1]

In yet another respect the privileges of the armament firms had recently been impaired. From the beginning of April, Lord Kitchener had thrown open Woolwich Arsenal and given instructions that representatives of any of the new groups should be allowed to visit the shops, inspect the whole process of shell manufacture, and receive whatever information and advice they needed. The effect was to break down any barriers of mystery that might have sheltered the expert production of shell, and even the usual reserve of trade secrecy. The armament firms had been accused of trying to keep munitions work in their own hands. Henceforth, the whole resources of expert knowledge were to be thrown into a common stock. The armament

[1] The sub-contractor's grievance may be illustrated from a letter sent by a Liverpool firm to the Armaments Output Committee, which stated that for turning 15-pounder shell a sub-contractor had been paid 2s. 8d. per shell. The time averaged 1 hour and 10 minutes. " Is this a fair price for man, machine, overtime, and standing charges ? " From another point of view, the system was unsatisfactory to the main contractors. Mr. G. H. West, of Armstrong's, wrote to Mr. Booth on 12 May that he had continually to send out assistants, whom he could ill spare, to help sub-contractors. He added : " A great deal of harm has been done by the indiscriminate placing of sub-contracts by armament firms."

Sir R. Cooper said in the House of Commons on 23 June : " Rightly or wrongly, an enormous number of business men in this country are suspicious that, if they work for anyone except directly for the War Office or the Munitions Department, they are working for vested interests. . . . There are the prices at which they have worked for armament firms, and the prices for which they themselves in a similar position have done work for the Government direct. There is a 40% margin."—(*Parliamentary Debates* (1915), *H. of C.*, LXXII., 1221–2.)

firms had now nothing to lose by following suit. Messrs. Armstrong consented to open their works in the same way; and Messrs. Vickers agreed on 20 April. Several others of the chief firms came into line very shortly afterwards. In Mr. Booth's words: "This is a co-ordinated scheme for bringing the whole of England into being on a patriotic basis, and for helping and putting at the disposal of all what have been considered as secrets and special devices—laying them all out flat, so that after the War any big firm would probably be able to make shell."[1]

It was anticipated that the method of sending a nucleus of managers, foremen, and skilled hands from the factories for a period of some eight or ten weeks' training at an armament firm, would be advantageous to both parties. The men who were sent would obviously learn much more than could be picked up merely by visiting the shops; and the armament firm would get the benefit of having selected men temporarily to man their idle machines. The system was more economical than the earlier notion of mobile labour battalions. Mr. Booth remarked on 20 April: "We do not want to get involved in a large labour-moving problem, with armies of engineers being marched about the country, working where we think it is best. We want to have each area keep its own men."[2]

III. The Number and Size of the Proposed New Areas.

The question of the number and size of the new areas was at first left undecided. At the conferences held towards the end of April, Mr. Booth was feeling his way, and he invited the representatives of the local groups and committees to advise him on this point. On 22 April, he spoke of the intention to start "probably four or five official units"[3]; and on the following day remarked that it was not desired to have more than six areas in the whole of England.[4] On 29 April he said: "We do not want to start with more than about twelve places, and we want those places large. We shall be forced down to the smaller places gradually."[5]

More important than the number was the principle, or principles, by which the size of a district was to be governed. The notion which had hitherto prevailed, of allowing twenty or thirty small groups, each producing 500 to 1,000 shells a week, to spring up in isolated towns, was now to be abandoned as uneconomical. Sir Percy Girouard contended that it would be impossible to provide the supervision which alone could guarantee effective production; and that each new centre would bring into the field one more competitor in an unrestricted scramble for labour, machinery, and raw materials. The first point was that the districts were to be larger, not in every case in mileage, but in volume of capacity and output. The units of weekly output were to be, not hundreds, but tens of thousands.

---

[1] A.O.C. *Printed Minutes*, p. 3 (20 April).
[2] *Ibid.*, p. 4. [3] *Ibid.*, p. 44. [4] *Ibid.*, p. 71. [5] *Ibid.*, p. 104.

Mr. Booth several times mentioned 200,000 shells weekly as the figure to be aimed at for the total production from all the new sources.

The problem of inspection was similar to that of supervision. The congestion at Woolwich had been a serious cause of delay, and, as early as 23 April, the Committee was endeavouring to arrange with Sir Frederick Donaldson that each of the new areas should have a local inspector.[1] They had in view the system adopted by the French Government, which had established local centres in the several districts, where inspection could be carried out from process to process. In this country, only the largest contractors—Vickers, Armstrong, Firth, Coventry Ordnance, and the Projectile Company—had local inspectors. It was purposed to extend the system to the new districts, subject to a final approval by an official of the Inspection Department at Woolwich.

Another canon for determining the size of districts was laid down in the principle, on which Sir Frederick Donaldson had laid stress, that each district should produce the complete round (without explosive or propellant). This ruled out small centres, where a group might be able to muster the lathes for machining the shell, but could not provide heavy presses for the forging. On 26 April, Mr. Allan Smith described as follows the difficulties that had come to light at earlier conferences :—

> " In the first place we have found that, while there is plenty of capacity for machining, there is not the supply of raw material. Then there is not the supply of presses for pressing out the forgings, and we have had a difficulty with the presses for pressing the copper bands on the shells. Again, the shell is not complete without the fuse, and, as the fuse is really a brass-finisher's job, sometimes we have had a difficulty in getting fuses, although we may have no difficulty in getting the machining of the shell done.
>
> " All these things point to a co-ordination of the various districts, because it is conceivable that one district where there are forges—for example, like Leeds, or Darlington, or Sheffield, which could turn out a large supply of forgings for machining—would be able to co-operate with a district where there are no forges . . . Then, on the other hand, where we have found that in some cases the tools are of a heavy quality, there is not a sufficient supply of small tools for the purpose of turning out the gauges, which are really a conglomeration of small parts. Then we have to go somewhere else to get a district which could co-operate with the other two districts so as to supply the fuses, and so in co-operation produce the finished article."[2]

Considerations such as these led on to the further problem of a more exact balancing of tools within the district, so that, for instance, the unit of production of a forging press working at full power should

[1] A.O.C. *Printed Minutes*, p. 68. [2] *Ibid.*, p. 78.

not seriously exceed or fall short of the unit of the copper-banding and nosing presses or of the machining capacity. It was evidently a matter of great difficulty to delimit areas which would both satisfy this principle without a wholesale redistribution of plant, and at the same time be compact and manageable for the purposes of supervision and inspection. It was proposed to leave the solution of this problem so far as possible to the local committees; but at the same time the purchase and distribution of raw material, machinery, and gauges were matters that called for the exercise of some control by the central organisation. It will be seen later how, under the pressure of these limiting factors, the Committee began to develop specialised departments.

IV. The Constitution of Local Munitions Committees.

The enlargement of the districts entailed the institution of a new type of local munitions committee, more representative than the small groups of employers who had undertaken the earliest co-operative schemes in single towns. Just before Sir Percy Girouard's plan was formulated, the National Advisory Committee had, on 17 April, discussed with Mr. Booth's Committee the danger that local bodies appointed to organise munitions work might overlap the local Advisory Committees representing Labour. Mr. Booth then drew up *Notes regarding the appointment of Local Committees*, which were printed and circulated by the War Office.[1] It was laid down that the local Advisory Committees "will co-operate with the local committees of employers with the view of settling promptly any questions which may arise, and, failing settlement, will invoke the assistance of the (National) Advisory Committee." The employers and the labour committees were each to nominate five or seven representatives, who were together to form a Joint Committee. The employers were to deal separately with all manufacturing questions; the Advisory Committees of the Unions with all questions affecting their members; the Joint Committees with questions which affected manufacturers and workpeople alike.

The Armaments Output Committee insisted strongly that the co-operation of Labour was essential to their scheme. They pointed out that they were bound to keep within the terms of the Fair Wages Clause in Government contracts, and that this fully recognised Trade Unionism. Mr. Allan Smith said on 26 April: "In connection with the production of these munitions, the Trade Unions have in great measure relaxed their ordinary working regulations, and they are doing things just now that they would not be willing to do in peace times. It is only reasonable, from that point of view, that the employer should do the same thing . . . I am very doubtful if the Committee would feel at liberty to recommend the War Office to agree to the placing of a contract in shops which absolutely refuse to have anything to do with men who are members of Trade Unions."[2]

---

[1] See Appendix XI.

[2] A.O.C. *Printed Minutes*, pp. 86, 87.

The Munitions of War Committee, on 7 May, considered the relations of the local committees to the War Office and to itself. It was decided that the local committees should be responsible to, and take their instructions from, the War Office, and that, in matters of general principle, the War Office might, at their discretion, consult the Munitions of War Committee.

A sub-committee also recommended that all future local committees should be constituted as follows :—

Representatives of Employers.
Representatives of Labour.
A representative of the Admiralty.
A representative of the War Office.
A representative of the Home Office.
A representative of the Board of Trade.

The consideration of this recommendation was adjourned on 13 May, and it does not appear that it was ever approved. It was certainly not put into practice.

In some places, committees with equal representation of employers and workmen were set on foot ; but this was the exception. Owing to the change in the character of the districts under Sir Percy Girouard's scheme, Mr. Booth's regulations above mentioned, which were issued on 21 April, were superseded two days later by a memorandum of general suggestions, which left it to each area to arrive at some arrangement which would be satisfactory to Labour.[1] The ultimate outcome was that, when once an executive Board of Management was appointed, the large local munitions committees, on which Labour had some representation, tended to become obsolete and were seldom called together The Board of Management, except in a few cases, consisted of a small number of employers only, and was thus a body of the same type as the original Co-operative Group. Often it was composed, more or less, of the same individuals.

V. Type of Contract and Prices.

The type of contract which it was at this time proposed to place with the new committees was adapted to the peculiar conditions. It was estimated that it would take eight or ten weeks to instal the machinery and to train the nucleus of workmen. If at the end of this period a committee could begin to produce shell, then for the next ten weeks they would be allowed to increase to any extent the amount produced weekly. After the tenth week they might continue to turn out shell at that maximum rate (but not to increase it still further without permission), the Government having the option of cancelling the contract at any time by giving ten weeks' notice.

Contracts on these terms were proposed to Lincoln, Keighley, and Manchester.[2] In the event, however, no formal contract of this type

[1] A.O.C. *Printed Minutes*, p. 74. [2] *Ibid.*, pp. 24, 85, 122.

was ever actually placed. Before the new bodies were ripe for that stage, the system had been changed again.

Mr. Booth explained on 23 April that it was intended to fix a uniform price for every article, but to allow an addition in some exceptional cases for extra cost of freight or material. Under the French system, a fixed price was paid by the Government to the district. The district management retained a fraction to cover their expenses, and apportioned the remainder among the firms who undertook the several processes. These might make a profit out of their fraction, if they could. Mr. Booth expressed a preference for leaving the sub-division to be made in this way by each locality.[1]

The prices offered to Groups at this time were[2] :—

H.E. Shell	18-pounder	23s
,, ,, ...	4·5-inch	£3
,, ,, ...	6-inch	£4 10s.
No. 100 Fuse (with gaine)		13s.

At Leicester, £3 was offered for the 4·5-inch shell, without nosing, but with the copper-band and base-plate. The Leicester Committee divided the amount as follows :—For material, 30/- ; for machining, 20/-; for carriage and depôt expenses, 10/-.

VI. The National Shell Factory Scheme.

The project of uniting A and B Areas into a number of new districts, each under the tuition and supervision of an armament firm and controlled by the manager of its ammunition department, was abandoned after a few days. The minutes of the meeting, on 26 April, at which it was communicated to the Munitions of War Committee, record that "Sir Percy Girouard explained that, since the report had been written (23 April), circumstances had pointed rather to the setting up of new Government factories than to the formation of co-operative groups."[3]

Sir Percy Girouard afterwards wrote that this change in his views was a consequence of visits paid, between 20 and 26 April, to Leeds, Birmingham, and other places. The main weakness which he had sought to remedy in the earlier plans for B areas, was the difficulty of providing competent supervision and inspection on a sufficient scale. His interviews with the committees at Leeds, Birmingham, and elsewhere, appear to have convinced him that the co-operative system was unworkable, and that the problem of supervision and inspection could only be solved by the establishment, in the more important centres, of Government factories of a new type. His first proposal, though it would have set free a certain amount of expert supervision to guide co-operative effort, would not, in fact, have touched the root of the difficulty, which lay in the dissemination of the work in each place among a considerable number of small shops. The new suggestion aimed at centralising the whole process of manufacture in single factories specially equipped for it, and so making much smaller demands on the time of supervisors and inspectors. It involved not merely abandoning the idea of taking

[1] A.O.C. *Printed Minutes*, pp. 75, 120. [2] *Ibid.*, p. 87. [3] M.C. 10.

the co-operative group under the wing of the armament firm, but throwing over the co-operative system itself. The other principles laid down in the memorandum—especially the principle of the larger district, self-contained, and producing the complete round—stood unchanged. But it was now proposed that the production should be carried on in new Government factories, in which the resources at the disposal of the local committees were to be concentrated under one roof.

Sir Percy Girouard had arranged that the Leeds Committee should visit Woolwich on 22 April, and a week later they went round Messrs. Armstrong's works under the guidance of Mr. Glynn West.[1] Referring to these visits, Sir Percy Girouard wrote :—" They returned unanimously of the opinion that, in view of the difficulties as to machine tools, supervision, inspection, and control, the best method in a district was to select a suitable factory and concentrate tools, workmen, supervision, and inspection under one management on a non-profit basis, and while the factory was being equipped, to send the management, together with selected skilled workmen, to a properly organised ammunition factory for instruction."[2] Sir Percy Girouard submitted a proposal on these lines to Birmingham on 25 April ; but the scheme was first worked out in detail at Leeds.

On 3 May, the Leeds Committee forwarded to Mr. Booth a draft scheme for the establishment of a National Shell Factory.[3] The proposals were submitted by Sir Percy Girouard to the Munitions of War Committee on 7 May, and in general outline approved.[4]

The main points of the Leeds scheme were as follows :—

(1) The Leeds area was to comprise the district covered by the Leeds and District Engineering Employers' Federation.

(2) The Committee desired power to establish a National Factory, capable of producing at least 20,000 18-pounder H.E. shells weekly from steel supplied to the works, as already provisionally promised, and to increase up to about 40,000 weekly, if required.

The shells were to be supplied at cost price, delivered to Woolwich Arsenal, or elsewhere.

(3) The Factory was to be controlled and directed by a Management Board to be appointed by the Government, consisting of :—

Leeds Engineering Employers, 5 representatives
Trade Unions concerned 1 or 2 ,,

(4) The Leeds Forge Company, Ltd., had, at the Committee's request, offered to place at the disposal of the Management

[1] From the date of Sir Percy Girouard's appointment, Mr. West, who was then local Director at Elswick in charge of gun ammunition production, gave expert advice and assistance to the committees at Leeds, Dundee, Bradford and Keighley, though it was not until 21 May that he was formally appointed technical adviser to the Army Council.

[2] Memorandum of 31 May, 1915. HIST. REC./R/200/7.

[3] D.A.O./3/570.

[4] The scheme was printed for the Committee (M.C. 14).

Board for shell manufacture a new building, 280 by 80 feet, self-contained, with electric power and all facilities. The Board desired power to accept the offer of this building at a fair rent, and to make the necessary alterations. The reinstatement at the end of the tenancy to be charged at cost price to the Government.

(5) The Management Board proposed, subject to the general control of the Government, to equip this building with existing machinery from factories within the district.

Action involving questions of compensation, other than reasonable hire or purchase price, was not to be taken without Government sanction. Adjustment of hire or purchase price was not to bar owners of plant or machinery from claiming compensation or consequential loss of profits arising from such hire or purchase. In case of dispute with owners, the Board was to report to the Government what machinery and plant was required and the owners' names; and the Government was to arrange, if so determined, through the Board, for the transfer under the powers of the Defence of the Realm Act.

(6) The Management Board was to engage the labour and work the plant at the cost of the Government, who would be the owners or lessors of all the machinery, would place the necessary funds at the Board's disposal, and would provide advice and technical supervision. No new buildings or extensions were to be erected without sanction of the Government, who were to arrange for the payment and ultimate disposal thereof, and of the machinery and plant therein.

The Board would engage suitable engineering, administrative, and secretarial staffs, and provide office accommodation.

(7) The Board offered their voluntary services. They were to receive no remuneration or profit as individuals, but out-of-pocket expenses were to be borne by the Government.

(8) The names of bankers and of auditors, to be appointed by, and responsible to, the Government, were suggested.

(9) The Board were prepared, if the scheme were approved, to take up all the work immediately.

This scheme was revised in certain details on 11 May, when Sir Percy Girouard and Sir Algernon Firth conferred at Leeds with the existing Munitions Committee, and afterwards addressed a meeting of engineers in the Town Hall. The principal change made was the omission of the Labour representatives on the Board of Management. The employers stated that at Leeds relations with Labour were easy and old-fashioned, and that there was no evidence that the workmen would insist on, or even desire, representation. As an alternative, it was agreed that a large committee, representing both Employers and Labour, should be formed to secure full co-operation and support for the Factory, and to act as an Advisory Committee to the Board of Management.

The revised scheme came before the Munitions of War Committee on 12 May, and it was then resolved that it should be put into operation at the earliest possible moment.[1] The formal sanction of the Government was obtained on the following day.

On 14 May, Sir Algernon Firth addressed a private circular letter to the members of the Associated Chambers of Commerce, recommending them to get their localities to work on the Leeds lines and to submit definite offers as soon as possible. A description of the Leeds experiment was published in May in a leaflet, entitled, *National Munitions Factories: Working Model.*[2]

VII. The Retention of the Co-operative Group as Alternative to the National Factory.

With the approval of the scheme for large districts and national factories, it appeared as if the group principle, which had undergone so many rebuffs, had now received its death-blow. Its originator and constant advocate, the Board of Trade, requested Mr. Booth to state whether he desired that the co-operation of the Labour Exchange organisation should be wound up. A report was prepared on 26 April, showing the stage which their work had reached at that moment.

The sample exhibitions were still open at nine centres, though the exhibits were not to the latest specifications and 18-pounder shrapnel shell was included. Inspections were being made, and the results, tabulated at the Central Office, were passed to Mr. Booth. The situation of the several groups which had been worked up by Board of Trade officials was as follows. In one instance—Leicester—an order had been placed. Bristol, Bradford, and Keighley had been interviewed by the Armaments Output Committee, and Bristol was awaiting a contract. Halifax, Nottingham, Hull, Wakefield, and Peterborough were ready to send deputations: Rotherham was to wait on the Committee on that day. Cardiff was under investigation.

The Board of Trade asked Mr. Booth whether it was desired that the inspections should continue, and that the Labour Exchange officers should co-operate with the Engineering Employers' Federation in forming fresh groups. The tenor of Mr. Booth's answer was embodied on 4 May in a draft circular to Divisional Officers, which, though it was not issued, illustrates the position at the moment.[3] The circular stated that it would no longer be necessary for the Board of Trade to take the same action as in the past for the engineering survey and the formation of groups. Though the possibility of placing small orders for shells and fuses was not excluded, probably attempts would be preferred to form a limited number of groups, capable of a very large output, in a few chief towns. Hence, while Mr. Booth

[1] The revised scheme is printed as an Appendix to the minutes of this meeting of the Committee (M.C. 18).

[2] HIST. REC./R/1121/4. [3] L.E. 1965/211.

would interview groups already formed, and Divisional Officers should keep engagements for meetings to form groups, they should not open up new ground. The exhibitions of samples were to remain open, but no further inspections were to be carried out in pursuance of these exhibitions. Requests for inspection were henceforth to be referred to Mr. Booth, to whom the reports already made had been forwarded.

On receiving a copy of this draft, Mr. Booth wrote on 6 May, requesting the Board of Trade to postpone action, as "the policy to be pursued was not yet definitely settled."

This uncertainty suspended progress at some of the centres where groups were becoming ripe for action, and for a short time caused some irritation among employers, who could not follow the very rapid changes of policy at headquarters. A deputation from Hull, which met the Committee on 3 May, recorded, in a letter to Mr. Booth, the impression created in their minds, "that either the statements in the press as to the requirements of the Government in the way of ammunition have been grossly exaggerated, or it is not considered desirable that any more outside firms should be brought into the manufacture of munitions of war."[1]

On the following day the Hull Committee was called together and the members were advised to proceed with their ordinary business. Mr. Booth succeeded in mollifying the Committee by explaining that, just because ammunition requirements were so urgent, it had been found necessary to concentrate on the areas capable of the largest production, while the capabilities of smaller areas were being ascertained with a view to calling upon them later. By "large producing areas" was meant, not only the districts round armament firms, but also large engineering centres like Leeds, where a weekly output of 40,000 shells was contemplated. The Hull Committee declared their willingness to await the convenience of Mr. Booth's Committee, and came to a conference shortly afterwards.

It was partly due to the influence of the Board of Trade, strengthened by the knowledge that they had acquired of the needs and capabilities of the several localities, that the principle of co-operative production was not abandoned, but allowed to stand as an alternative to the National Shell Factory.

Mr. Davison, in a memorandum written on 8 May,[2] criticised Sir Percy Girouard's new scheme, the details of which had not yet been fully disclosed. He urged that "the most effective means of increasing the output of munitions lies in the use and development of existing resources, and not in the substitution for them of completely new centres of production. It is estimated that the new scheme, which involves the moving of labour and of existing machines, the manufacture of new plant, the equipment of new premises, and

[1] D.A.O./1/549. [2] L.E. 1965/218.

organisation of a new staff for each centre, would require at least six months to come into effective operation. During this time no use is to be made of the existing resources of the country, and some men who could be making shell would be engaged in making new machinery. The transfer of labour and machinery on a large scale would be a matter of great difficulty, and would cause dislocation throughout the country. In addition to the difficulties and delay involved, the scheme could not fail to produce considerable ill feeling."

Mr. Davison's main contention was that no uniform scheme should be adopted for the whole country, but each locality should be treated according to its capacity and requirements. The system of giving a joint order to a group of manufacturers met the case of many firms who could spare a margin of capacity for shell manufacture, but could not contribute either men or machines to the proposed new centres without sacrificing their other Government work. In places where the local firms could undertake only some of the processes, the most economical method was to instal in some central depôt the missing plant, which was often only the presses for forging or nosing. This method obviated the necessity for shifting plant and labour on a large scale ; and the groups could be gradually fed with fresh labour and machinery as their power developed.

> " It is probable that Sir Percy Girouard's scheme would arouse considerable opposition in the engineering trade generally, and especially among those firms whose plant and labour would be requisitioned for the new centres. It is understood that protests have already been made by group committees in several towns. Accusations will inevitably be made that the armament firms are promoting the present scheme in order to preserve their monopoly of this class of manufacture, since the alternative scheme would be likely to set up serious competitors both during and after the War."

With regard to the problems of supervision and inspection, Mr. Davison estimated that not more than 25 groups of different sizes were likely to be formed. The " mothering system " (which could in any case be retained) would provide for the instruction of their management at the armament firms ; and the experience of the British Thomson-Houston Company and of the Leicester Group showed that the difficulties of shell manufacture had been exaggerated, and that expert advice was needed only in the early stages. Local inspectors could be appointed to the collecting and distributing centres established in each town ; and it should be quite practicable to arrange for frequent Government inspection on the spot.

Finally, Sir Percy Girouard's scheme would involve enormous expense in equipping the new centres and compensating the firms whose plant and labour would be requisitioned. The new factories, moreover, would remain on the Government's hands at the end of the War.

The support given by the Board of Trade to the co-operative principle brought about a compromise, which has become a permanent feature of area organisation. On 7 May, letters were addressed to the local munitions committees explaining that, while it had been decided in the first instance to concentrate upon the areas capable of a very large production, and to leave in abeyance the districts which promised only a small output, it was nevertheless hoped that every manufacturing centre would form a local committee, if it had not already done so. Such committees would prepare for any future emergency by acquainting themselves with the resources of their district in labour and machinery. They would receive drawings and specifications, and also the results of the census made by the Labour Exchanges and by the Home Office. It was desirable that Labour should be represented.

Another form of letter was addressed to certain committees already in existence, asking whether, if a National Factory on the Leeds model were not found to be suitable to the needs of the district, the Committee could distribute orders for component parts of shells and fuses, assemble these parts in a central factory for finishing and inspection, and form a Board of Management to supervise the execution of their contract. The following were given as the minimum weekly quantities of shells or fuses that should be offered:—

H.E. Shell	13-pounders and 18-pounders	5,000, in the proportion of 1 to 5.
,, ,,	4·5-inch	1,000
,, ,,	6-inch	500
No. 100 Fuse		5,000

On this basis the Armaments Output Committee at last established a policy which was not further modified until after the foundation of the Ministry. Even then, the changes that were made were rather in the framework of administrative machinery than in the constitution and methods of the local centres. The Board of Management in some places has controlled a National Factory, in others has acted as a Co-operative Group. In some instances both systems have existed side by side. It is not necessary here to pursue the minor variations by which the two types were adjusted to peculiar needs or conditions.

CHAPTER V.

CENTRAL ORGANISATION UNDER SIR PERCY GIROUARD AND MR. BOOTH, 28 APRIL TO 26 MAY.

I. Organisation of the Armaments Output Committee, 20 April, 1915.

The table given below may serve to illustrate the stage of development which the Armaments Output Committee had reached when Sir Percy Girouard's original scheme for co-ordinated Areas under Government Superintendents was in contemplation, that is to say between 20 and 26 April, 1915. The table is, of course, partly designed to provide for the administration of that scheme, which was never in fact adopted; but in other respects it registers the advance that had already been made in that internal differentiation of function which was beginning to give the Committee the structure of a department. Thus, by 20 April Mr. Allan Smith and Mr. MacLellan were already specialising on the problem of machinery; Lord Elphinstone was devoting himself to district organisation; and Mr. Ridpath was concerned with American supplies.

Draft only.

TREASURY COMMITTEE.

WAR OFFICE ARMAMENTS OUTPUT COMMITTEE.

Central Committee: Mr. George M. Booth, Chairman.

1. *Supplies—Machinery:* (Technical Department):
   Mr. Allan Smith; Mr. MacLellan.
2. *Secretariat:*
   Mr. G. H. Duckworth; Mr. Arthur Baxter.
3. *Canada and U.S.A.:*
   Mr. E. Guy Ridpath.
4. *Statistics, Finance, Auditing:*
   Auditor.....; Mr. E. Guy Ridpath (Advisory).
5. *District Managers:*
   Lord Elphinstone; Mr. Follett Holt.
   Government Superintendents of Armament Districts.
   District Engineers, Secretary.
   District Committees (representing manufacturers).

"The Government Superintendent, addressing the District Manager, will report to the Central Committee on the area possibilities, etc. When he requires to move machinery in the area, he will consult or arrange with the District Committee concerned. When he requires machinery to be supplied from outside his own district, he will communicate with the Central Committee's Technical Department. He will be the official go-between of the Central Committee and the District Committees."

II. The Appointment of Sir Percy Girouard and Mr. Booth.

The need for a stronger central organisation was urged by several speakers in a debate which took place on 21 April, in the House of Commons, on the following resolution moved by Mr. Hewins :—

> "That this House, while welcoming well-considered steps for increasing the mobility and efficiency of labour, is of opinion that it is urgently necessary that the resources of all firms capable of producing, or of co-operating in producing, munitions of war should be enlisted under a unified administration in direct touch with such firms."[1]

The general tone of the debate was not hostile to the Government ; but objections were made to the plan of collecting information and asking advice from local committees, and then proceeding to formulate a scheme. Mr. Hewins argued that the Government should "begin to organise at the top." The business community required to have a definite proposition laid before them, framed by some responsible person, "a man of real, concrete, organising ability, who would have the power and the will to decide questions at issue and take responsibility." He should be assisted by a technical advisory committee, representing the broad divisions of the industries concerned in munitions production, and divided into sub-committees. The local committees would still be entrusted with the functions of collecting information and organising their districts in the light of their knowledge of local conditions.

Mr. Bonar Law pointed out that neither the Munitions of War Committee nor the departmental committee at the War Office was a "central committee" of the type that Mr. Lloyd George had seemed to foreshadow in his speech on the Defence of the Realm (Amendment) No. 2 Bill.[2] The problem was much too vast to be met by stretching existing machinery. The Government must bring in new machinery which should consist of men trained in business, who understood how the industry of the country could be mobilised.[3]

This debate very nearly coincides with Mr. Lloyd George's invitation to Sir Percy Girouard to formulate a plan for "the creation of

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXI., 277 ff.
[2] See Part II., Chap. III.
[3] *Parliamentary Debates* (1915), *H. of C.*, LXXI., 329.

an organisation in England and the Empire which would fully provide for ammunition requirements," and Sir Percy Girouard's memorandum was drawn up two days later. The Government, in fact, accepted, and indeed had already anticipated the view expressed in the House of Commons, that the central body needed to be strengthened and placed on a more independent footing.

On 26 April, the Munitions of War Committee, after considering Sir Percy Girouard's memorandum and approving its proposals in general outline, referred to a sub-committee[1] "the question of the constitution of the proposed central department and its relation, on the one hand, to the Chancellor's Committee, and, on the other, to the War Office and Admiralty." The sub-committee reported on the same day that, in their opinion,

> "Sir Percy Girouard and Mr. G. M. Booth should be appointed to give effect to the scheme, with such modifications as should be found necessary, and that they should act in close co-operation with the departments of the War Office, the Admiralty, and other authorities concerned.
>
> "In the event of any questions arising between them and any Department concerned with the supply of munitions of war or armament labour, these questions should be dealt with by the Chancellor's Committee."

The full Committee was asked to consider what authority should make the appointment; but it was suggested that, in any case, Sir Percy Girouard and Mr. Booth should probably constitute the channel through which, so far as the scheme was concerned, the Army Council should exercise its powers under the Defence of the Realm Act. The Secretary of State for War would probably have to consider the relation between the administration of the new scheme and the existing War Office Committee on Munitions; but it was hoped that, whatever might be his decision, the services of individual members of that Committee would still be available.

The sub-committee's report was accepted, and it was agreed that the appointment of Sir Percy Girouard and Mr. Booth should be made by the Secretary of State for War.

Lord Kitchener immediately acted upon this conclusion. Two days later, the following *Notice* was issued at the War Office:—

> "*War Office*, 28 *April*, 1915.
>
> "The scheme for increasing the output of ammunition submitted by Sir P. Girouard to the Chancellor of the Exchequer's Committee on Munitions of War on 26 April and recommended by that Committee has been accepted by the Government, and the Secretary of State for War has appointed Sir P. Girouard and Mr. G. M. Booth to carry that scheme into effect, so far as may

[1] The sub-committee consisted of Sir H. Llewellyn Smith, Sir Frederick Black, Sir Percy Girouard, Mr. Booth, and Mr. Henderson. (M.C. 10.)

be found practicable and subject to such modifications of details as may be found necessary and expedient from time to time. In matters covered by the scheme, Sir P. Girouard and Mr. G. M. Booth are authorised to act without further reference to the Secretary of State. They will maintain co-operation with all Government departments concerned with the supply of munitions of war or of labour for producing such munitions, and, in event of any difference arising between them and any such department which cannot be mutually adjusted, the instructions of the Treasury Committee on Munitions of War are to be followed."

It will be observed that, although the name " Armaments Output Committee " remained in use, this appointment set the Committee on a new basis. It had hitherto been a departmental committee, with no formal powers, attached to the department of the Master-General of the Ordnance. Henceforth, its two heads were authorised to act, in matters covered by the scheme, " without further reference to the Secretary of State." Nor was the Committee, except in the event of inter-departmental differences, directed to take its instructions from the Munitions of War Committee. Its charter was contained in Sir Percy Girouard's memorandum, which assigned to the " central department," not merely the function of acting as intermediary between the local organisation and the War Office and Admiralty, but also the duty of " controlling the whole of our Imperial output " of ammunition. It is obvious that the setting up of a body with powers so wide, so anomalous, and so ill-defined, could only have been intended to provide a temporary bridge for the transfer of at least the most vital section of munitions supply from the War Office to a Department on a regular footing under a responsible Minister of the Crown. The Armaments Output Committee from this moment falls into no regular category. What is of interest is to observe how, under pressure of the conditions of its problem and in particular of such limiting factors as machinery, gauges, raw materials, and labour, it developed the rudiments of departmental structure.

III. Co-ordination and the Balance of Requirements.

From a very early stage of its operations, the Armaments Output Committee had become alive to certain defects in the system of purchase for Government Departments, which, though in times of peace they may only have led to some extravagance, under the growing stringency of resources in labour, materials, and tools, now threatened to impede and dislocate production.

In the first place, there had been up to this time no machinery to provide for co-operation in this matter between the War Office and the Admiralty. Neither Department possessed such knowledge of the other's operations as would enable it to avoid competition in the same markets and consequent delays. Mr. Booth gave as an instance the case of ammunition boxes. The Admiralty found that the woodwork

was ahead of their requirements, but that the supply of hinges was held up. These were made by two or three firms, who probably did not know they were making for the Admiralty. They sold them to an agent, who might be distributing them to the Admiralty, or to the War Office, or for export.[1]

The Armaments Output Committee procured the appointment of a Joint Committee of the two Departments, which it was proposed should also secure priority for the most urgent work.[2]

In the second place, within the War Office itself, several different departments separately bought stores of which the requirements were to some extent interdependent. Thus, while the Master-General of the Ordnance department purchased shells, motor lorries came under the Quartermaster-General, and Military Aeronautics bought everything required for the Flying Corps. There was no means of ensuring that the supplies of shell would not outrun the supply of lorries necessary for its transport. As Mr. Booth remarked on 22 April: "It is going to be a very difficult task for the War Office to see that, in so far as it produces anything in increased quantities, it produces correlatively the high explosive, and the propellant, and the cartridge boxes, and the motor lorries for moving it about. We have got to try and keep a sense of proportion, so that we do not go and make a lot of 4·5-inch shells and get a sort of peak in that line, with a great valley which is not up to date in these other things."[3]

Mr. Booth was here referring specially to the efforts of his own Committee. He had become aware of the danger involved in the very success of the campaign he had undertaken for an unlimited increase of the supplies of a few types of shell and fuse. This was one of the reasons for calling a halt, and suspending the haphazard formation of co-operative groups. "We are here, not now quite so much, as was said in the original Kitchener Committee, to produce shell and fuse, but to organise, through the assistance of really scientific committees in each great area, as well as in each secondary area, our knowledge of what that area can produce best, and then to add it up.....There might be, say, twenty offers of making 4·5-inch shell, ten of which would be eminently suitable, and ten less suitable. To the former we would give 4·5-inch shell, and the other we might put on something else."[4]

As Mr. Allan Smith put it on the same occasion: "The main idea that we have is, taking the information that we procure from the various districts, to see how we can possibly co-ordinate, not only the districts themselves, not only the towns involved in those districts, but the supplies in view of the requirements."

It is clear that, when this point had been reached, the Committee would not long be able to confine itself even to gun ammunition. As early as 27 April, Mr. Booth said the Committee would gradually take over the whole question of the output of motor lorries.[5] It was

[1] A.O.C. *Printed Minutes*, p. 18. HIST. REC./R/171/1.
[2] *Ibid.*, p. 28. [3] *Ibid.*, p. 44. [4] *Ibid.*, p. 45. [5] *Ibid.*, p. 92.

inevitable that the principle of keeping a balance over the whole field of production of inter-related stores should lead still further.

IV. Relations with the M.G.O. Contracts Branch (A 7).

On 22 April, Mr. Hanson arranged with Mr. Booth a procedure to be adopted with regard to offers from firms.[1] It was agreed that, in cases where offers were received, which for any reason it was impossible to accept, the Committee and the Contracts Branch should keep each other fully informed of the objections to acceptance. Mr. Hanson stated that he frequently received proposals from firms who appeared to him to be unable to do much by themselves, but might be useful as members of a Co-operative Group. In such cases, Mr. Booth requested that the Committee might be informed, in order that, where a group was being formed, they might advise their correspondent in the group of the fact that the firm was willing to assist.

After the reconstitution of the Armaments Output Committee, it was agreed on 15 May with Mr. Hanson that all applications for contracts received from new firms by Contracts A 7, other than those relating to rifles, parts of rifles, rifle ammunition, scientific instruments, and explosives, should be referred to Mr. Booth.

V. The Beginnings of the Machine Tool Department.

In a report prepared for the Minister in June, 1915,[2] Sir Percy Girouard wrote :—

> " The want of machine tools has undoubtedly been one of the main factors in the failure of the British manufacturers of ammunition to fulfil their promises. Had there been any central authority to indicate to machinery manufacturers the total requirements which would be entailed by the great expansion of munition factories authorised by the Government in 1914, we might have avoided to some extent the delays that followed."

This statement may be supplemented from information supplied by several of the principal firms about the middle of March. The Birmingham Small Arms Company reported that, while they had no shortage of materials or labour, certain milling machines due from the United States in November, 1914, had not yet arrived. Messrs. Harper & Bean and the Birmingham Metal & Munitions Company complained that large numbers of new machines were then from four to six weeks late in delivery. Messrs. Dick, Kerr, were awaiting the arrival of lathes from America. In some instances these delays were due to the congestion of the docks at Liverpool and of the railways. In the case of home supplies, they were partly attributable to the disorganisation of the trade caused by indiscrimate enlistment and other disadvantages common to every branch of engineering. By April these hindrances to supply, coinciding with the large increase of demand, had brought about a stringency which could not be remedied by the violent method of commandeering machines and shifting them from one factory to

[1] 94/GEN. No./95. [2] HIST. REC./R/200/10.

another, but called for a systematic control of orders for new machines and a direction of the supply along channels determined by central authority.

Before the reconstitution of the Armaments Output Committee at the end of April, Mr. MacLellan and Mr. Allan Smith had already begun to investigate the problem. They called in the help of Mr. Alfred Herbert, who was then President of the Machine Tool Makers' Association. Mr. Herbert, as has been mentioned above,[1] had been keenly interested in the organisation of munitions production since the previous year. He offered his personal services on 22 March.

On 21 April, Mr. Allan Smith explained the measures that were being taken as follows :—" We have made a census of the production of all the machine tool people that we can think of. We have now got replies from the majority, and we are getting in the others day by day. Any of that machinery which can be usefully diverted to people making armaments in this country, without interfering with any interests that we desire to protect, will be available straight off.

" We propose to communicate with the contractors as a body, and ask them what machinery they require, what is the class, what are the dimensions, and when they would be ready to instal. Then we can see, from the information we have, the dates when the machinery referred to is to be completed, and, if necessary, we might expedite the particular machinery that was required, and by that means tap a source that is new, and a source which will give us what we desire, without having to wait for the usual manufacturing delays."[2]

The information from contractors, referred to in the second paragraph above, was obtained by means of an advertisement issued on 20 April for insertion in a large number of daily papers.[3]

The Committee soon began to contemplate purchase by the Government of those types of forging and banding presses which the local committees found it most difficult to provide, and the distribution of them by sale or for return.[4] It was proposed to deal in the same way with the shortage of gauges. The Committee intended to purchase 30 or 40 sets of gauges. Each local committee was to receive a master set, which would be used only for checking the working gauges. At the end of April, the Committee was considering whether the Government should take the whole output of the best gauge-makers and prohibit them from accepting private orders.[5] The lack of gauges, indeed, threatened at this time to be the most serious factor in limiting production. The manufacturers were accustomed to turn them out to a high standard of finish in every part. Mr. MacLellan, with the help of Sir F. Donaldson and Dr. R. T. Glazebrook, Director of the National Physical Laboratory, did some valuable work in simplifying the designs so that only the necessary surfaces should be made perfectly true.

The Committee had also begun, before 27 April, inquiries into the export of machinery to the Colonies, the Allies, and neutral countries

[1] See p. 29. [2] A.O.C. *Printed Minutes*, p. 30. [3] 94/Gen. No./78.
[4] A.O.C. *Printed Minutes*, pp. 25, 65, 104. [5] *Ibid.*, pp. 98, 109.

The Cabinet had instructed the Committee to give them a controlling answer upon which they might decide to what extent these orders should be stopped or diverted

On 25 April, Mr. Herbert was invited by Sir Percy Girouard to undertake the organisation of the Machine Tool Trade for the War Office. He took up his quarters at Cecil Chambers on 27 April, which may be taken as the date of foundation of the Machine Tool department.

Mr. Herbert's first action was to promote the issue of an order to Machine Tool Makers, containing instructions designed to direct the supply of machine tools in process of manufacture to armament work for this country or for the Allies.[1] The Order was drawn up after consultation with Sir Reginald Brade, Sir Frederick Black, the Treasury Solicitor, and Sir H. Llewellyn Smith. A draft was submitted to the Munitions of War Committee on 7 May, and it was decided that it should be sent out immediately. The Order was issued in the name of the Army Council on 10 May to the firms whose names were attached in a schedule. It is of interest as being one of the earliest attempts to secure precedence for a certain class of Government work, and as having provided a model for later schemes of Priority classification, an account of which will be given elsewhere.

The Order stated that it was necessary that supplies of all machine tools, presses, or other similar appliances in the country should be made immediately available for the manufacture of munitions. To this end, manufacturers were instructed to divide all orders for such articles, whether in progress or on their books, into two classes[2] :—

> A. Orders for British and Allied Governments and Armament Companies ; for contractors and sub-contractors to these, where orders were for use on Government contracts or sub-contracts ; and for the Colonies or India, where it was known that orders were for use on munitions work.
>
> B. Orders for Neutral Countries ; for the Colonies or for India, where it was known that the orders were for use on munitions work ; and for British firms, where orders were not for munitions work.

In delivery, preference was to be given to orders in Class A, and, wherever this could be so secured, orders in Class B were to be diverted or suspended without regard to contracts or obligations. Future orders under B were to be accepted only on the understanding that they were liable to suspension, diversion, and delay, and that they could not in any case be executed so long as similar orders in Class A were awaiting execution.

---

[1] M.C. 262. HIST. REC./R/172/16.

[2] It had been decided not to establish orders of precedence inside the two classes, as originally proposed by Mr. Herbert. Mr. Herbert had at first suggested a third class, C : Orders for Norway, Sweden, Holland, and Italy ; but this was considered to be unnecessary in view of the Order in Council of 26 April prohibiting the export of metal-working machinery to certain foreign countries.

Attention was called to the clause in the Defence of the Realm (Amendment) No. 2 Act which gives protection against actions for breach of contract, and to Regulation 8 A, under which the Order was made. On Mr. Herbert's advice, it had been decided not to refer to the Defence of the Realm Losses Commission or to suggest claims for compensation.

Later in May, the department took further steps to extend its control over the supply of machine tools. A letter,[1] over the signature of Sir Reginald Brade, was issued, stating that it was necessary that no orders should be accepted except from the British and Allied Governments, and their contractors and sub-contractors, without the express permission of the War Office. Before proceeding with orders for machine tools for civil work, the makers were to apply for instructions whether such orders might be accepted or not.

A form of fortnightly Return (E.R. 1) was issued at the same time, requiring information as to machine tools already in stock, in progress, or in transit to this country, which were intended for export or for civil work in the United Kingdom. It was proposed to divert such machines to destinations where they would be most useful for munitions production.

From the information obtained and from the large number of applications for licence to export machine tools, the department learned that a considerable amount of work was still going on for neutral countries, which was likely to benefit the enemy. This led to further restrictions. A circular issued in June recommended the makers not to accept orders for neutral countries without reference to the department, which would advise whether the work should be put in hand or not. The firms were also warned not to take orders from merchants without proof that the machines were for munitions production.

The total effect of these successive measures was that the department had assumed a nearly complete control over the destination of the products of this trade before the Machine Tool firms were declared to be controlled establishments soon after the passing of the Munitions of War Act.

VI. Raw and Semi-manufactured Materials.

In peace time, it was no part of the business of any branch of the Contracts department at the War Office to obtain systematic information as to the general state of metal production at any time. Contracts 3 dealt in metals only so far as these were required for manufacture at Woolwich and Enfield, and for the Army Repair Shops. The armament firms, of course, catered for themselves, and to a large extent supplied their sub-contractors with semi-manufactured materials. In the early months of 1915, the Contracts department asked the main contractors

[1] 94/Gen. No./109.

to state whether they had any difficulty in obtaining certain materials ; but no general enquiry into the resources of the country was undertaken till the Armaments Output Committee took up the question towards the end of April.

Sir P. Girouard and Mr. Booth, reporting to Mr. Lloyd George at the end of May, wrote as follows[1] :—

> " Hitherto, after placing orders with main contractors, Government Departments had assumed that their responsibility for the materials for manufacture ceased. This, for war purposes, was a grave error. In peace, when military operations are not vitally dependent upon the delivery of munitions, main contractors could have recourse to courts of law in cases where sub-contractors for materials failed. Such a course, in time of war, when the lives of our men are at stake, is inconceivable.
>
> " The Department,[2] sweeping aside all ordinary considerations, sought at once to obtain information as to the war position in the following basic supplies :—
>
> 1. Copper Rings.
> 2. Cartridge Metal.
> 3. Brass Rod of high quality.
> 4. Aluminium Rod.
> 5. Lead Bullets.
> 6. Antimony.
> 7. Spelter.
>
> " The consideration of our position in detail with regard to copper, steel, and ordinary metals was postponed for the moment as being relatively less urgent.
>
> " The visible supply of these seven semi-manufactured materials is entirely outside the knowledge of any direct contractor, and in no case does a main contractor produce any one of them in sufficient quantity to meet his war requirements. In other words, they form a bottle-neck through which every shell, fuse, and cartridge case, gun and rifle, machine gun and shrapnel bullet, must pass before a complete round, less its propellant and high explosive, can be produced in this country. It was the duty of the Government, not of the main contractors, to enquire into this ; for a contractor could have no possible *locus standi* in any such investigation. Such an enquiry had not been initiated until a month ago, and it is as yet by no means certain that these vital necessities for the output of ammunition under existing contracts can be found in the country, much less the quantities under contemplation by this Department in its short existence."

---

[1] Memorandum of 31 May, 1915. HIST. REC./R/200/7.

[2] *I.e.*, the central organisation under Sir P. Girouard and Mr. Booth.

A memorandum of 15 June adds some further criticisms[1] :—

> "The situation was made worse by the fact that, whereas, in ordering gun ammunition, the Government Department amply covered the requirements of the Royal Factories in respect of raw materials, they yet dictated to the main manufacturers orders on a continuation system, subject to three months' notice on either side. Under such conditions, it was idle to have hoped that the manufacturers would hold in stock or on option supplies materially in excess of what was necessary for three months.
>
> "It was the pre-eminent duty of the Government in war to schedule the output of raw materials and manufacturers in Great Britain. It should have been a further duty to warn the main contractors that the Government were placing huge orders in America, and to ascertain how far this would affect their sources of supply for raw materials. For, in many respects, British contractors have been largely dependent on foreign sources ; but it is difficult for them to-day to estimate how far these supplies will be forthcoming. Finally, on the top of the British orders, the Russians, the French, and presumably the Italians, have placed immense orders for materials. The position is somewhat deplorable."

The information obtained in April from the deputations of local Groups had made it clear to Mr. Booth's Committee that they would have to assume some responsibility for the supply of materials to the districts. Mr. MacLellan, who studied this aspect of the problem, stated on 21 April that practically every works that could roll round bars or Siemens-Marten acid steel was fully occupied with an order placed by the French Government with some fifteen or sixteen firms for nearly 150,000 tons of steel, due for completion in June. The Committee was prepared, if necessary, to suspend part of this order ; but it seemed probable that 500 tons would cover, up to the end of June, the needs of any districts then starting work. They proposed to arrange for 500 tons to be rolled, and to distribute the quantities required by the local bodies for the experimental stages of their work. Larger deliveries could be arranged for later.[2]

On 22 April, Mr. Steel, of Steel, Peech & Tozer, Ltd., attended with the deputation from Sheffield. He stated that unless the steel makers were given some idea of the amount of steel that would be required for the enormous increase in shell production that was contemplated, the supply would run short. Only two shell makers in the country made their own steel ; and every steel maker was absolutely put to his limit of supply. He suggested that some data should be got together as to the amount of shells that would be turned out by the existing works and the new works, and that the steel makers should, with that information, try to arrange to turn out the steel. It could only be done if the makers abandoned some part of their work and turned over to shell steel. It was practically impossible to-day to get a ton of steel in the

[1] Hist. Rec./R/200/10. [2] A.O.C., *Printed Minutes*, p. 30.

country ; the whole output was taken up. This had nothing to do with shipping. There was no cover in pig-iron, as there had been three months ago. They could get as much iron as they wanted. Even to take the enormous quantities of steel made for foreign Governments would not help to supply the Government with a high explosive steel, under the present specification (which Mr. Steel did not approve of). This was made by practically three or four firms, who could only meet the demand if they could make arrangements months beforehand.[1]

By 29 April, the Joint Committee of the War Office and Admiralty had begun to investigate the sources of supply of the various classes of metal. These were to be scheduled, so that the Committee might undertake to supply the districts with materials which they could not obtain for themselves. Every manufacturer and every contractor for the two Departments had been asked to furnish a return of his orders for raw material, the sources from which he was obtaining it, the terms of delivery, and what the weekly deliveries were. If it should be found that any supplier had overestimated what the Committee believed to be his capacity, they would send down and check it. They would then try to start fresh sources of supply.[2]

The purchase of raw materials by the Government was not actually undertaken before June. On 2 June, Mr. Booth informed the Hull Munitions Committee that it had been decided that the War Office should buy all the steel required by the districts and supply it to them at cost price. Arrangements were then being made to establish a special Raw Materials department.[3] This was put under the direction of Major Carmichael, of the Engineering department of the Crown Agents for the Colonies, an organisation which had been attached to the Armaments Output Committee since the last week of April.[4]

Sir P. Girouard's memorandum of 15 June,[5] states that a hurried survey of the situation had been made since 1 May, with respect to the more important classes of materials.

Spelter.—Since the beginning of the War, Spelter had risen in price from £30 to above £100. This material was of the first importance in the manufacture of Brass Rod and Cartridge cases ; though whether it was essential was difficult to determine. Since the specification had been frequently changed during the War, the principal makers had been brought together in conference. They had promised to hold stocks which, with those already in the hands of the Committee, would guarantee the position up to the end of the year.

Brass Bar or Rod, and Cartridge Metal.—Several conferences had been held with the Cold Rolled Brass & Copper Association.

---

[1] A.O.C. *Printed Minutes*, p. 48.

[2] *Ibid.*, p. 110. An account of an Admiralty Sub-committee for advising on purchase of raw materials, nominated on 20 April, is given in Appendix XII.

[3] D.A.O./1/549.

[4] A.O.C. *Printed Minutes*, p. 95.

[5] Hist. Rec./R/200/10.

Owing to confusion as to the specification, some had used purer Spelter than was necessary. The pure Spelter should be reserved for cartridge metal required for guns, machine guns, and small arms. The principal Rod Makers had undertaken to increase their plant to meet all requirements.

Copper Driving Bands.—There was a good supply of copper itself. The three chief producers of Copper tubes[1] had been instructed to lay down fresh plant. The increase of output, varying from 100% to 300%, should meet all needs, particularly as the bulk of this rod was required for fuse work, for which it was hoped to use steel more largely, as in France and Russia.

Aluminium Rod.—There were ample quantities of this metal; but there was only one maker, who would be instructed to increase his capacity.

Antimony, used for hardening shrapnel and rifle bullets, had risen in price by leaps and bounds and would rise higher. Certain supplies had been secured, and alternatives were being considered.

High-grade Steels for Cutting Tools, etc.—The high-grade Steels now in use had permitted the speeding-up of all cutting, milling, slotting, etc., machines in the engineering trades from 30 feet a minute to 120 feet. There appeared to be enough machines in this country to turn out the necessary supplies. All the bar and pig required, however, came from Sweden. Any interference with this source of supply would lead to a grave situation. The stocks usually arrived between April and October. Four months' supply was now in existence; and if the supplies came forward as usual up to October, a 12 months' supply would be available in the later months of the year. Manufacturers were to be impressed with the desirability of spreading out the supply by economy. If the supply were cut off, the most rigid economy would be needed, or alternatives would have to be found But the Swedish ore seemed to have some natural property, lacking in all the substitutes tested.

Steel.—There appeared to be little fear of any serious lack of steel for ammunition. A conference with the steel manufacturers had been arranged for 16 June.

The above-mentioned were the main raw or semi-manufactured materials that had so far been dealt with; but many others would call for investigation.

Co-ordination of Components of Manufacture.—No attempt had been made by the Government to provide a census of the components held by contractors or by the Royal Factories, or to secure a proper distribution by means of exchange. Some manufacturers were heavily overstocked in some things, while others were living from hand to mouth. Every effort was being made to obtain a

[1] The Broughton Copper Co., Thomas Bolton & Sons, and the Yorkshire Copper Works, Ltd.

census—in other words, to pool the stocks on paper and thereby ensure a reasonable exchange.

VII. Labour Questions.

(*a*) Enlistment of Skilled Men and Release from the Colours.

No account of the Armaments Output Committee's activities would be complete without reference to the attempts made by Mr. Booth to secure some settlement of the conflict between the claims of the Army and of the factories, and to introduce some co-ordination among the competing authorities.

One matter which called for his intervention was a case of overlapping which occurred in the issue of recruiting instructions. The incident may be recorded as an illustration of the extraordinary want of co-operation between the military authorities and the Labour Exchange department, which for the previous three months, had, at the request of the War Office, been steadily supplying labour for armament purposes.

On 31 March, the Director of Recruiting issued a memorandum[1] to all recruiting officers, instructing them to place themselves in communication with all the firms on the War Office list of firms protected from recruiting, and to "do all in their power to obtain suitable men to join those of them who are in want of labour." About the same date, a poster, headed "*The Man the Army wants now*," was published by the War Office.[2] Fitters, turners, millwrights, other skilled workmen, and also unskilled workmen not at present engaged in the production of war material, were invited to volunteer, and to give in their names at the nearest recruiting office, stating what class of work they could perform.

The Board of Trade naturally protested against this usurpation of the functions which had been legitimately exercised by the Labour Exchanges, and, with Mr. Booth's help, they succeeded in procuring the withdrawal of the instructions to recruiting officers, who were now told to refer to the Labour Exchanges any lists of men they had already registered. The Labour Exchanges were then to place the men, if possible, in the ordinary way, after carefully ascertaining that they were not on Government work.[3] The War Office poster had unfortunately not indicated that specially skilled men were required; indeed, it had expressly invited unskilled men to apply. The result was that the great bulk of the applicants were found to be useless for armament work, and only an insignificant fraction could be placed.

It was no less difficult to establish any concerted policy, within the War Office itself, on the much more serious question of the conflict of interests between the recruiting authorities and the department

[1] 2745 (A.G. 2B). [2] See Appendix XIII.
[3] L.E. Department, C.O. Circ. 1795 (14 April, 1915).

of the Master-General of the Ordnance. In a statement prepared for a sub-committee appointed by the Munitions of War Committee on 26 April to consider co-ordination, Mr. Booth wrote :—

> " The recruiting department at the War Office takes no interest in the troubles of the supply departments. Over 10,000 men were recruited from the engineering trades between 1 January and 28 February, and it is only now that an effort is being made to co-ordinate recruiting for the Front with recruiting for production."

The War Office, unlike most Government Departments, had no single permanent head, superior to the heads of departments. The only person who could adjudicate between rival claims was the Secretary of State, whose time was fully occupied with other duties. This defect of organisation hampered Mr. Booth's endeavours to get the recruiting instructions satisfactorily settled.

Shortly after the issue of the poster mentioned above, Mr. Booth and an officer of the Board of Trade drafted instructions to recruiting officers not to enlist certain classes of men without reference to the Labour Exchanges. Before the printed forms were ready for issue, Lord Kitchener decided that the instructions were to be revised, and that the men should be recruited on the understanding that they might be required to accept employment with a firm doing munitions work. At the end of April, Mr. Booth was trying to get this decision reversed.

The problem of checking the enlistment of skilled men, was, of course, closely connected with the question of Release from the Colours. It appeared to be equally difficult to find effectual means of preventing men from joining the ranks and of recovering them when they had joined. With regard to release, Lord Kitchener had ordered in March that men urgently required for the manufacture of munitions might, in very special cases, be withdrawn from the Expeditionary Force, but every case was to be approved by the Secretary of State on the recommendation of the Quartermaster-General. The men were not to receive Army pay. Many letters were being received from firms and individuals asking for the release of their workmen ; but the Adjutant-General and the regimental officers were reluctant to part with men whose superior intelligence and character made them the best soldiers.

About 23 April, Lord Kitchener took the further step of issuing orders to Commanding Officers, to report by telegram the numbers of men of specified trades (fitters, millwrights, etc.) in certain camps, and to send batches of men direct to some of the chief armament firms. The men were sent without the War Office knowing their names and without any close investigation of their qualifications. They were to remain soldiers and wear uniform, but to receive neither Army pay nor separation allowances, though they might be working away from their homes. The result was that much awkward feeling was created between these soldiers and the regular employees of the firms to which they were sent.[1]

[1] L.E. 1965/190.

Anticipating that this system would lead to trouble, Mr. Beveridge drew up on 25 April an alternative scheme for Release, specially designed to secure the return of those men, and only those, who according to their past employer's experience would be of the greatest value for the work required. To avoid difficulties of housing and separation allowances, the scheme provided for the return of men who had originally been enlisted in the districts where they were now to work, so that they might live at home. Lists were to be obtained by the Labour Exchanges from past employers, not of particular men they wished to recover, but of all men of the classes required for urgent Government work anywhere. These lists, collected and classified, would form a reserve of labour, to be drawn upon as a last resource. They could be compiled in advance for any number of trades when difficulty was anticipated, and the men could be returned only if, when, and for so long as, the difficulty existed. The scheme could be applied, if desired, not only to the large armament firms, but to any employer doing urgent work for the Admiralty or War Office.[1]

The question of release was fully discussed at a conference between the Armaments Output Committee and a deputation from Manchester on 29 April.[2]

One of the employers said that the enlistment of skilled men was still going on. He had applied to the General Officer Commanding the district, who had refused a general exemption, but said that, if the name of any particular man who had enlisted were forwarded, the man should be sent back. The General had not, however, replied to further letters on the subject. It was useless to exempt certain firms, because other firms were indirectly doing war work.

It was stated that Lord Kitchener had said that any man who was wanted might be brought back; but that he did not want to take out of the Army men who had had six or eight months' training, if the labour difficulty could be met in any other way. Mr. Booth's Committee had then suggested that no further skilled men should be taken.

Lord Kitchener had promised to consider this, and instructions were to be issued to recruiting officers prohibiting enlistment from certain firms and certain classes of employment. There was a conflict of opinion between the Committee and Lord Kitchener. Lord Kitchener held that, if a man were released, he should not leave the Army altogether, but should remain a soldier, subject to recall to the Colours and to some sort of technical discipline, and receive no Army pay for the time being.

Some of the Manchester employers approved of the principle that the men should remain in the Army. It gave a certain hold over the man, and at the same time satisfied his desire to enlist and wear the uniform. Men were refusing to work, if they were not allowed to enlist. It was remarked, however, that the men were going, not from eagerness to enlist, but to escape social persecution.

---

[1] L.E. 1965/190. [2] A.O.C. *Printed Minutes*, p. 126 ff.

Mr. Booth asked whether the employer's position would be strengthened if the release were for a short period, not to be renewed except on the employer's application. Some of the employers expressed their approval of this plan ; another questioned whether a man could be kept at his employer's request, if he wanted to rejoin. It was also objected that men entered the Army as free individuals, and, if they were released and then sent back to the Army as a punishment, trouble would follow. If all the men were in the Army there would be no difficulty ; but if only a percentage were soldiers and special pressure were brought to bear on them to speed up the factory, things would not work smoothly.

The discussion ended without any conclusion being reached.

On 7 May, Sir H. Llewellyn Smith presented to the Munitions of War Committee a *Memorandum on the Effect of Recruiting on the Supply of Armament Labour*. He stated that all efforts to increase the supply of labour were being counteracted by recruiting in the engineering and shipbuilding trades. In the previous two months, 3,659 men had enlisted from 600 engineering firms which employed 100 men or more before the War. Assuming these results to apply to all the 655,000 engineers in the Kingdom, the total enlisted in these two months would be 8,000, probably as many as had been recruited for armament work in the same period. The corresponding figure for 135 shipbuilding firms, employing 156,000 males, was 1,200.[1]

It was arranged by the Munitions of War Committee that Mr. Balfour should confer with Lord Kitchener on the subject. On May 12, Mr. Balfour reported that he had seen Lord Kitchener, and had been informed that arrangements had been made by the War Office, which would effectively prevent the further drain of men from armament work to the Colours.

The arrangements in question were embodied in a circular memorandum[2] issued by the War Office on 12 May. Lists were enclosed of skilled trades, connected with munitions and Admiralty work, and of selected firms producing munitions of war for the War Office or the Admiralty. All the labour falling within these lists was to be temporarily barred to recruiting. No men enlisted after this date were to be allowed to return to civil work, even on munitions, unless they had had three to six months' training.[3]

It appears that these instructions did not in fact prevent the enlistment of substantial numbers of men covered by them. A table giving the enlistment figures for the three months from mid-April to

---

[1] Tables showing the effect of enlistment on certain industries are given in Part II., Appendix II.

[2] GEN. No. 6/5166 (A.G. 2B). C.O. Circ. 1835 (L.E. 1965/188).

[3] In connection with these instructions a Royal Warrant was issued on 11 May, 1915, granting separation or family allowance to released soldiers.

mid-July shows that in that period another 26,000 men were taken from the metal trades.[1]

Reviewing the situation on 9 June,[2] Sir H. Llewellyn Smith pointed out that the two adverse factors—expansion of demand and enlistment—had far more than counterbalanced any decline in private work. In the engineering trades alone, out of 588,000 occupied males, about 105,000 were stated by their employers to have joined the Forces. Though something like 57,000 not previously employed in engineering establishments had been drawn in, the numbers then working were still 48,000 below those working in July, 1914. In shipbuilding, of 164,000 men, 25,000 had joined the Forces, and 30,000 had been drawn in, so that the numbers actually occupied exceeded the numbers in July, 1914, by about 5,000.

The Armaments Output Committee established in May the nucleus of a Labour department in the form of a section dealing with Release from the Colours. This was at first grouped with the Raw Materials section under Major Carmichael. The Reports of the Intelligence Section from 13 May onwards give figures for releases that had been "arranged for." The total releases "in bulk" for the six weeks ending 29 May are given as 2,694; the releases of specified individuals as 276. But no records exist to show what numbers of men were actually released and placed in employment on munitions work before the establishment of the Ministry.

(*b*) Regulation of the Movement of Labour: the Prohibition of Enticement.

The Munitions of War Committee, besides intervening in matters relating to the supply of men for armament work, also made the first definite move towards securing a control over the movement of Labour.

The particular problem with which it was faced was one which had been brought to the notice of the Board of Trade in January when it began to canvass employers to release their men for armament work.[3] The shortage of skilled men had inevitably led to attempts on all sides to attract labour by advertisement, by canvassing agents, and by offers of higher wages. In the engineering trades men were tempted to leave one firm for another without any regard to the consequent dislocation of work on Government contracts or sub-contracts. The Departments themselves had taken part in the scramble. In January, for example, the Admiralty had put up posters outside an important armament factory in the North inviting fitters and other mechanics to go to the Torpedo Factory at Greenock.[4] At Leeds, Hull, Halifax, Bradford, and Sheffield, the armament firms were advertising in the press that their representatives would attend at the Labour Exchanges

[1] See Part II., Appendix II., Table III.

[2] *Memorandum on Labour for Armaments* (9/6/15). HIST. REC./R/320/1.

[3] See above, Part II., Chap. I.

[4] L.E. 2008 Report of N.W. Divisional Officer.

to select men for employment. The protests of the local employers may be illustrated by a resolution passed by the Halifax District Engineering Association[1]:—

> "At a meeting of the Halifax Association of Engineering Employers held 12 January, 1915, great complaints were made regarding the sending of representatives from Sir W. G. Armstrong, Whitworth & Co., and Vickers, Ltd., to entice the men from our shops. The meeting strongly protests against this unjustifiable means of robbing us of our employees, as practically the whole of the shops in this district are fully occupied on work for war material. The unanimous feeling of the meeting is that the Labour Exchanges are being used for a purpose for which they were never intended, viz., for recruiting centres for armament firms."

In April, the deputations which met the Armaments Output Committee complained that enticement was still unchecked. The Admiralty was offering by advertisement in Birmingham high wages for turners wanted at the Greenock Torpedo Factory.[2] The proposal was made by Mr. Dudley Docker on 20 April that men engaged on War Office work should not be allowed to leave without a certificate from their employer. Mr. Booth was opposed to laying the prohibition on the men, and Mr. Allan Smith thought that the Unions would object to any system of leaving certificates. In illustration of the movement of labour that was going on, Mr. Booth stated that of every 100 men who had gone to Elswick since August, 1914, about 35 had left, so that the permanent increase was only 65% of the arrivals. In three works belonging to Messrs. Vickers, the number of men leaving their employment during April and May amounted to nearly 50% of the number taken on in the same period.[3]

At this time complaints began to be heard also from the men's side. On 18 April, the General Secretary of the A.S.E. wrote to Sir George Askwith that a number of members of that Society who had left employment at Beardmore's (Dalmuir) and Lang's (Paisley) to take work at Fairfield at higher rates, had been discharged on representations made by their previous employers. He added: "You will readily understand the great irritation which is set up by this interference with the liberty of our members to secure work at enhanced rates of pay, and we trust that your Committee (the Committee on Production) will at once issue an instruction with regard to this matter, in order that our members may receive some satisfaction. We shall be glad if you will kindly regard this as an urgent matter, as we understand that much disaffection is rife in these districts owing to the action of the employers."[4]

---

[1] L.E. 1965/29.

[2] This advertisement was still exhibited at the end of May, after Mr. Booth had for seven weeks been trying to persuade the Admiralty to withdraw it (M.C. 492).

[3] A.O.C. *Printed Minutes*, pp. 5, 10.

[4] I.C. 490.

Sir George Askwith reported these complaints to the Board of Trade on 23 April, and suggested that, as the Committee on Production had no authority, the matter should be taken up by the Munitions of War Committee. On the same day, the Board of Trade submitted to the Munitions of War Committee a draft Regulation under the Defence of the Realm Act. The Regulation was promulgated by Order in Council of 29 April. It read as follows :—

> " 8 B. The occupier of a factory or workshop the business carried on in which consists wholly or mainly in engineering, shipbuilding, or the production of arms, ammunition or explosives, or of substances required for the production thereof, shall not, nor shall any person on behalf of the occupier of such a factory or workshop, by canvassing, advertisement or otherwise, take any steps with a view to inducing—
>
> (*a*) any person employed in any other factory or workshop, being a person engaged on work for any Government Department or otherwise serving war purposes, to leave his employment ; or
>
> (*b*) any person resident in the United Kingdom at a distance of more than ten miles from the occupier's factory or workshop, to accept employment therein, otherwise than by notifying vacancies to a Board of Trade Labour Exchange ;
>
> and in the event of any person contravening the provisions of this Regulation he shall be guilty of an offence against these Regulations."

The Board of Trade made the following supplementary Regulation under the Labour Exchanges Act (1909) :—

> " The Officer in charge of the Labour Exchange in notifying vacancies to applicants for employment, shall during the continuance of the present war give priority to such vacancies as he has reasonable grounds for believing to be on work for any Government Departments or otherwise serving war purposes."

It will be observed that Regulation 8 B avoided the objection raised on the side of Labour to any interference with the workman's freedom to seek higher wages, by laying its prohibition only on the employer. The Order did not forbid either the mere engaging of a workman on the ground that he had just left Government work or the offer of higher wages. It only prohibited attempts, on the part of employers whose business was engineering or of the other kinds specified, to induce men by canvassing, advertisements, etc., to leave Government work or to travel more than 10 miles to apply for work. The check on advertisements and on the use of travelling agents proved beneficial ; but the difficulty of discovering and defining " inducements " was very great.

The Regulation was practically, though not formally, superseded by Section 7 of the Munitions of War Act, 1915, the intention of which was partly to strengthen the Regulation and to bring it *intra vires*.[1]

[1] See Part IV., Section VII.

VIII. Conclusion.

The Prime Minister's decision that "a new Department, to be called the Ministry of Munitions," should be created was announced in the Press on 26 May, and on that day Mr. Lloyd George took up his departmental work at Whitehall Gardens.

The Armaments Output Committee had then been in existence for exactly eight weeks. During the first four weeks it had been under Mr. Booth; during the last four, under the joint control of Mr. Booth and Sir Percy Girouard. So much was done in this short period, so little time was left for making any permanent record, that, with the scanty evidence available, it has been possible to give in the preceding chapters only an imperfect sketch of its activities. Even so, the achievement stands out as remarkable.

When the Committee was appointed, the great bulk of its work fell upon its two active members, Mr. Booth and Mr. Allan Smith, who had to borrow makeshift accommodation and collect a staff as best they could. The pioneer work of the Board of Trade had borne fruit in a single order placed at Leicester for 1,000 shells a week. By the end of May, Mr. Booth and Sir Percy Girouard had under their general direction an organisation which already deserved the name of "central department."[1] One branch, under Lord Elphinstone, was dealing with national manufacture. It was in correspondence with 21 local munitions committees and had placed two direct contracts. It had in view six National Factories and five Co-operative Groups. The total weekly output promised amounted to 38,000 18-pr., 5,000 13-pr., and 37,500 4·5-inch H.E. Shell and 25,000 No. 100 Fuses. A second branch, under Major Carmichael, was in charge of raw and semi-manufactured materials and Release from the Colours. It was exercising control over the Tube Association, the Rolled Brass and Copper Association, and the Aluminium trade. Mr. MacLellan had a section for gauges, presses and steel. Mr. Alfred Herbert, in the Machine Tool Section, had established control over the manufacture in the United Kingdom and the export and import of machine tools. Mr. Chartres had begun to organise an Intelligence Section.

The credit for this achievement must be divided between the Board of Trade, which prepared the ground; the members of the Committee; the manufacturers, who responded to the appeal; and Mr. Lloyd George, who gave publicity to the movement and lent to it the weight of Ministerial support.

---

[1] See Table attached to Sir P. Girouard's memorandum on *The Output of Munitions of War* (31 May, 1915). HIST. REC./R/200/7.

APPENDICES.

APPENDIX I.

(CHAPTER I., p. 7.)

Survey of Engineering Firms.

Proposed Form of Inspector's Report.

SURVEY OF ENGINEERING FIRMS.

Date .....

Messrs. ..... Articles normally manufactured:

Address ....

Questions.	*Answers.*
I. (*a*) Is the firm actually at work on a British Government contract or sub-contract? Specify the nature of the order.	
(*b*) What proportion of the firm's total capacity for armaments is occupied on this Government work?	
II. If the firm is not fully occupied on Government work, have they any machinery on their premises of the classes set out in List A which could be used for the manufacture of any of the articles (or parts of them) set out in List B? Answer here Yes or No, specifying on List A details of machinery.	
III. (*a*) Does the firm now employ any hands of the classes described in List C? The number of men in each class should be shown on the List and the total, with information as to short time, stated here.	
(*b*) If these men are engaged on work in connection with private orders, the nature and source of such orders should be specified as accurately as possible. In particular state if any of the work, though not in itself Government work, is required to enable Government work to be performed by other firms (*e.g.*, the making of machines).	

NOTES.

APPENDIX II.

(CHAPTER I., p. 8.)

Home Office Census of Machinery.

Form of Inspector's Report.

Occupier ..... District .....

Address..... Signature .....

Normal Industry..... Date .....

MACHINERY.

Type.	Total Number.	Number used for.				Where used, *e.g.*, Toolroom or actual manufacturing proces.
		War Office.	Admiralty.	Allies (state which).	Private Customers.	
Lathes, etc.						

WORKERS.

Class.	No. of skilled men employed.		Remarks.
	On work for Crown or Allies	On private work.	
Foremen, etc. ..			

Remarks, giving information particularly as to :—

(*a*) Is the factory accustomed to turn out repetition work of high precision ?

(*b*) Are they willing to undertake contracts or sub-contracts, and, if so, for what processes and what articles ?

(*c*) Actual hours of work, to show short time, overtime, night shifts, and week-end work.

(*d*) Is there surplus of power, and room for additional machinery ?

(*e*) Any other important points.

APPENDIX III.

(CHAPTER I., p. 9.)

Engineering Survey.

Report for the War Office.

(Form used by Labour Exchange Officers who inspected firms after the Exhibitions of Samples).

Date .....

1. Messrs.....

Address.....

2. Articles now manufactured: state if the firm is actually at work on British Government contract or sub-contract.

3. Articles which firm now offers to manufacture :

4. Plant installed of the character described in enclosures to C.O. Circular 1741 :

5. Rate of delivery apart from orders in hand : state date when firm can begin delivery.

6. Wages as compared with district rates :

7. Staff employed in departments likely to be affected by Government contracts :

July, 1914.	Present Time.	Short time, if any, or overtime.

8. Would firm be prepared to undertake new Government work of the above character :

(*a*) With their existing machinery ?

(*b*) With their existing labour ?

9. Any remarks :

Signature.....

APPENDIX IV.

(Chapter I., p. 11.)

Mr. E. W. Moir's Report on the French Organisation for Munitions Production.

It was decided at the second meeting of the Munitions of War Committee (14 April, 1915) that Mr. Lobnitz should be sent to France immediately to investigate the French system of organisation for increasing output. Messrs. E. W. Moir and Lobnitz arrived at Paris on 16 April, and returned 21 April. They were instructed to enquire particularly as to the manufacture of shells and fuses.[1]

(1) To what extent these were being produced by firms not so engaged before the War, with full details as to the kinds of shell so produced, whether whole shells or parts were made, etc.

(2) As to the administrative methods for outside production, whether mainly by contract with individual firms, or with co-operative groups, and how such groups were organised; what powers of compulsion the Government possessed; whether compensation was made for loss of private contracts; whether private work was allowed; details as to census of machinery, how prices were fixed, etc.

(3) What special steps had been taken to educate and assist outside firms with regard to supervision, distribution of samples, drawings, etc., payment for experiments, financing new machinery, raw material, inspection and testing.

(4) The supply of labour, wages, discipline, and other conditions of work.

(5) What special steps had been taken to stimulate production in factories previously engaged in making shells and fuses.

Information on similar lines was to be obtained with respect to Field guns; Field howitzers; Propellants; High Explosives ("very little is needed here"); Rifles ("very important"); and Small Arms Ammunition.

Messrs. Moir and Lobnitz presented a Report to the Armaments Output Committee on 22 April. A less technical Report[2] was circulated to the Munitions of War Committee and considered at the third meeting on 26 April.

The chief points may be summarised as follows:—

1. *General Remarks.*—Approximately 30,000 to 40,000 small calibre high explosive shells per day were being turned out, with the

[1] Instructions and Reports, M.C. 212.

[2] M.C. 7, 23 April. Report of 22 April and Minutes of the Armaments Output Committee meeting at which it was discussed, M.C. 212.

necessary gaines and fuses, by new firms. This amounted to about one-half of the total French output.

After the receipt of detailed information and the order to proceed delivery of some shell cases might be expected in from 1½ to 2 months, and an established engineering works could reach its maximum output in from 3½ to 4 months.

No shrapnel shells had yet been made by private firms, but the necessary plant was now being installed by some of the larger producers. Very few shells above 75 mm. had been made by inexperienced firms.

Certain modifications of design, made to facilitate manufacture, had resulted in gun bursts and had been abandoned.

2. *Visits to Works.*—Eleven factories had been visited, ranging from one firm which only produced 25 partly-finished shell cases a day, to Messrs. Renault, who made shell cases, gaines, and fuses complete up to 6,000 a day.

No private firms were making high explosive or propellants. Shells were charged only at Government factories distant more than 100 miles from Paris.

3. *Administration.*—At the outbreak of war the Ministry of War selected one works to be chief of the group of works in each district, and contracted with this chief for supply of shell cases and fuses at fixed prices, uniform for each item throughout the country. The chief sub-let parts of the work to other firms in the group at a slightly lower fixed price. Each member of the group was responsible for the accuracy of his own work. It was now thought that firms capable only of a very small output should be excluded. The Government supplied all raw material and paid for failures due to raw material. No powers of compulsion other than those of the mobilisation laws were needed. Compensation was given for proved loss of private contracts. No private work could be done in factories working on munitions without leave of the Ministry of War. No census of machines or of firms had been taken, but some information as to capable firms was available at the outbreak of war. The inspecting officers distributed drawings and patterns and, at the outset, gave advice and help ; but methods were left free to the manufacturers, subject to the results being satisfactory.

4. *Payments for work done.*—A universal uniform price for each item was undoubtedly the best method.

5. *Financing firms.*—Some firms had received advances amounting to 25% of the value of the order, to be repaid by rebate on price. In one case a large amount was spent on entirely new works and machinery. Many firms, however, had adapted their plant without assistance.

6. *Conditions of Labour.*—Women had been freely employed without friction ; they learnt quickly and worked well. Some men had been recalled from the Colours for munition work. They received the

district wages, becoming soldiers again and reverting to army pay if they left the factory. Wages were paid at pre-war district rates ; but piece-work rates were usually preferred and adopted. The Ministry of War saw that wages were not reduced ; but they had not been increased ; and there was no increased rate for night work, overtime, or Sunday work. One half-day a fortnight was allowed for recreation. There were few absentees. Strikes and labour troubles were unknown. The output per employee was high, running out at from 3 to 4 75 mm. shells per day. Mobilisation would deal with any indiscipline or irregularity.

7. *Increase of Output from existing sources.*—In the National Arsenals a system providing for increase of labour force and for running night and day had been worked out ready for Mobilisation. The Government appropriated all munitions produced by firms working for export in peace time.

8. The Ministry of War thought that rifles, field guns, propellants, and high explosives could not be produced by private inexperienced firms.

APPENDIX V.

(CHAPTER II., p. 21.)

Lord Kitchener's Letter to Employers, 27 March, 1915.

War Office,
Whitehall, S.W.

Sir,

I stated in the House of Lords on the 15th March that we were in urgent need of certain war supplies for the manufacture of which the machinery at our disposal is in excess of the available supply of labour.

It is essential that we should obtain a further supply of such labour. With this in view, I have asked Mr. George M. Booth, acting under my immediate direction, to take the necessary steps to obtain the release from such civil work as can be postponed of the labour required for military purposes. The work will be closely co-ordinated with what has been done and is being done by the Board of Trade in this direction. You will be hearing shortly from the Committee, and I would ask you to do everything you can to help me.

Yours faithfully,

(Signed) KITCHENER.

APPENDIX VI.

(CHAPTER II., p. 21.)

Mr. Booth's Letter to Employers, 29 March, 1915.

War Office,
Whitehall, S.W.

Dear Sir,

You will have received a letter from Lord Kitchener on the subject of the special need of skilled labour for the increased output of war material. In this connection I should be much obliged if you will fill in the enclosed form and return it in the enclosed envelope as promptly as possible.

The War Office, while prepared, if necessary, to make full use of the powers granted by the Defence of the Realm Amendment No. 2 Act, is anxious to disturb employers as little as possible.

You are at liberty to take your workmen into your and our confidence on the subject of this letter. We should like them all to know that Lord Kitchener considers this matter as of the utmost urgency and importance.

Yours faithfully,

(Signed) GEORGE M. BOOTH.

APPENDIX VII.

(CHAPTER II., p. 23.)

Questionnaire accompanying Mr. Booth's Letter of 29 March, 1915.

STRICTLY CONFIDENTIAL.

For the use of the War Office.

ARMAMENT LABOUR RETURN.

M .... Trade.

Locality of Works .... Date.

Question.	*Answer.*
1. Enumerate your various classes of work at present in hand.	
2. Are your men working— (*a*) Short time ..... (*b*) Full time ..... (*c*) Overtime	
3. Are you engaged on any Government contract or sub-contract ? If the latter, from what firm or firms ?	
4. Have you inspected the sample shells, etc., exhibited at Aldwych Labour Exchange, and taken any action in consequence ? If so, what ?	
5. If the answer to question No. 3 is "Yes," state— (*a*) The class of Government work. (*b*) The percentage your Government work bears to your total work now in hand.	
6. Assuming that arrangements for compensation in respect of private work postponed could be made under the Defence of the Realm (Amendment, No. 2) Act— (*a*) Could you with *your present plant and present staff* do more Government work— (1) Of the class you are now doing ? (2) Of any other class ? (*b*) Release men for armament work elsewhere ?	
7. State the number of men you employ, and the rate of wages paid thereto who may correspond approximately to any of the classes set out below.	

Classes of Workmen employed.	Rate of Wages.	No. on War material.	No. on Civil work.	Total.
1. Fitters, Viewers, Markers off				
2. Turners				
3. Horizontal Borers				
4. Gun Borers				
5. Drillers				
6. Gear Millers				
7. Gear Planers				
8. Grinders				
9. Capstans				
10. Millers, Vertical, Universal and Profile				
11. Cross Millers				
12. Planers				
13. Shapers				
14. Slotters				
15. Rifling Lathes				
16. Polishers				
17. Shell Machinists				
18. Rifling Machinists				
19. Lapping Machinists				
20. Reamering Machinists				
21. Chambering Machinists				
22. Smiths				
23. Hammermen and Stampers				

APPENDIX VIII.

(CHAPTER II., p. 30.)

Form of P.R.1 Return.

P.R.1.

STRICTLY CONFIDENTIAL.

For the use of the War Office.

WAR OFFICE ARMAMENTS OUTPUT COMMITTEE.

ARMAMENT PRODUCTION RETURN.

SHELL AND FUSE PLANT.

Messrs.....

Question.	*Answer.*
A. What proportion of your plant and machinery is at present engaged on production of shells, fuses and/or parts thereof ?	
B. Is such plant and machinery being used to the fullest extent, including night-shift ?	
C. What proportion of the remainder of your plant and machinery is suitable or could be easily adapted for production of such work ?	
D. If the plant and machinery at present so engaged is not fully employed as above—	
(1) If you are short of orders, state what proportion of plant and machinery is affected.	
(2) If you are short of labour, state the number of various classes *now* required and the rates of wages offered.	
(3) If you are short of raw or partly manufactured material, state whether the shortage arises from failure to deliver against your orders placed— (*a*) At home. (*b*) Abroad.	
(4) Give names of suppliers causing delay.	
(5) Give particulars of delay being experienced in transport— (*a*) By rail. (*b*) By steamer.	
E. Give particulars of new plant in course of erection.	
F. Date when completion of installation is anticipated.	

Question.	*Answer.*
G. Particulars and cause of any delays in connection with new installations experienced regarding— (1) Buildings. (2) Machinery.	
H. Progress since last return as to— (1) Installation of machinery. (2) Supply of labour.	
I. What arrangements are you making to secure labour for your new plant ?	
J. With regard to the full usage of your new plant do you anticipate any difficulty in obtaining necessary supply of raw material ?	
K. Are you experiencing any delay due to— (1) Drawings, (2) Designs, (3) Inspection, (4) Shipping instructions, (5) Any other causes ?	

Signature.....

Date .....

APPENDIX IX.

(Chapter II., p. 31.)

Mr. Booth's Correspondence.

The following lists will give some idea of the nature of the correspondence which Mr. Booth had to deal with. The letters were elicited by Mr. Lloyd George's speeches on the Defence of the Realm (Amendment) Act in March; Lord Kitchener's speech of 15 March; the announcement of the Treasury Committee, and the various posters and advertisements issued in May.

It must be understood that the miscellaneous collection from which these specimens are taken does not include the more promising offers of service or of premises, factories, etc., which were classified under districts or filed. Nor does it include the returns sent by employers in response to Mr. Booth's letter of 29 March, or the results of the industrial surveys and census of machinery. The lists are intended merely to illustrate the extraordinarily varied nature of the correspondence and the eagerness displayed by every class in the nation to assist the Government.

(A) Offers of Services.

Applicant.	*Work or Position Required.*
Engineer's Labourer and handy man.	A vacancy.
Retired Accountant in the West African Civil Service.	Employment in the War Office.
Late Private, Northamptonshire Regiment.	Used to horses and general labour.
Chief Clerk in Paving Contractor's Office.	Light work in evenings at factory or Government Department.
Silversmith	One day a week munitions work.
Manager of a Concrete Company ..	Services.
Old Harrovian with a touring car	To drive Officers.
Foreman Blacksmith	To serve on Armaments Output Committee.
Draper's Assistant	Services in any capacity.
Iron worker from Vancouver ..	Munitions work.
Unskilled Draper	Munitions work.
Silversmith	Supervision.
Clothier, with a fair knowledge of things in general.	Services.
Clerk of Works	Supervision of building construction.
Small Tradesman	Any post.
Employee of London County Council	Services.
Ex-Railway porter, with slight knowledge of the use of plane and saw. Barman.	Munitions work.
Engineer on Indian State Railways	Services.
Unemployed Coppersmith ..	Munitions work anywhere.

Applicant.	*Work or Position Required.*
Educated woman	Filling shells.
Naval Architect	Services of the firm.
Woollen Merchant	Services in procuring clothing materials.
Inspecting Engineer	Post as Inspecting Engineer.
Manager of brick and pipe works ..	To go anywhere.
Commercial Traveller	Inspecting workshops.
Gardener (deaf)	Metal work.
Printer	Munitions work anywhere.
Manager of Furniture-making Association.	Services in any capacity.
Unemployed Compositor	Services in any capacity.
Consulting Engineer	Post as Inspector.
Baker and Confectioner	Vacancy in the Foodstuffs Department.
Compositor	Position of trust.
Belgian refugee, Brass Moulder ..	Munitions work.
Manager of Motor-vehicle works ..	Any vacancy.
Journeyman Cabinet-maker and Trade Union official.	Organising an office.
Repairer of Musical Instruments (deaf).	Any manual work.
Private business in the jig-saw and puzzle line.	Services at usual rates.
Engineer of 20 years' experience ..	Services.
Works Manager of Electro-typing Company.	Services in any capacity.
Ironmonger's Foreman	Munitions work.
Insurance Broker	Transport Officer, Customs Officer, Valuer or Assessor.
Commercial Traveller with knowledge of shipping stores.	Services.
Science Master in County School..	Munitions work.
Storekeeper on South African Railways and Canadian Pacific Railway.	Any position.
Lady (about 60), Music Teacher ..	Clerical work or making ammunition.
Stone-mason..	A job of work at anything in the labouring class.
Engineer, Indian Railways ..	Inspection of munitions works.
Understands thoroughly the handling of barrels.	Suitable work.
Optical Mechanician	Suitable work.
Canadian Engineer in Vancouver..	Instructor or foreman. (Offered to bring Canadian and American mechanics.)
A lady	Offer to organise a party of ladies for armament work.

Applicant.	*Work or Position Required.*
Undergraduate with car	Unskilled labour in Ordnance works.
Storekeeper, Buenos Aires Harbour Works.	Any suitable position.
Retired business man	Services.
Amateur Engineer (Belgian) ..	Munitions work or interpreting.

(B) Offers of Premises, etc.

Nature of Firm.	*Offer.*
Hay and Straw Merchants ..	Works, to be fitted with machinery.
Farmer	Some buildings and machinery.
Boiler Works in liquidation ..	Premises and machinery for sale.
Ginger-beer Makers	Premises and land for lease or sale.
Cycle and Motor Engineers ..	Shop with oil engine and lathe.
Brewery	Spare power and accommodation.
Engineer	Small shop and smithy.
Steam Flour Mills	Empty premises for store or hospital.
Shipbuilder	Three shops, to be fitted with machinery.
Potters	Empty works for storage.
Iron Foundry	To sell or hand over for the War.
Slate Quarries	Works for hire.
Electrical and Sanitary Engineers .	Large workshop and staff.

Several thousands of the more promising offers of premises, machinery, and going concerns were subsequently classified under districts and catalogued.

At the end of May a list of the factories offered to the Government was compiled. Some of the factories included appeared to be fully engaged on Government work ; others of the offers might equally well have been classified as applications for further contracts. In some cases the offer seemed to have been prompted by shortage of labour ; and it was not always possible to make out whether an adequate staff was included in the offer.

The numbers included were as follows :—

London Division	21
Birmingham and Midlands Division	13
Liverpool and Manchester District	11
Leeds Division	5
Scotland Division	7
South Western Division	5
Wales Division	10

(c) Requests for Contracts, Purchase of Stock, etc.

Firm.	*Offer.*
Mill and Colliery Furnisher ..	Large stock of gas, steam, and water tubes, etc., for sale.
Carver and Gilder	Would make ammunition boxes.
Gates and Railings Maker ..	Any forged iron-work.
Advertising Agents	Office advertisements.
Picture Frame-makers	Two circular saws for hire.
Building Contractors	Large stocks of timber.
Electric Company	Further War Office orders.
Dental Manufacturing Company ..	Fittings and parts of rifles.
Steam Sawyer	Sawing timber.
Office Fitter	Wood work.
Steam Pumps	More foundry work, forging and machining.
Water Softeners	Purifying water for explosives manufacture.
Not specified	Will produce ten times the amount of shells the army requires, automatically, without engineering appliances.
Maker of Paper-fasteners	Cartridge caps.
Nail Works	Shells, if provided with machinery.
Joiners and Builders	Tent-bottoms.
Iron Works	Iron castings.
Builder	Aeroplanes.
Tailor	Army clothing.

(d) Miscellaneous Suggestions.

There are seventy to eighty thousand Insurance Agents who might be enlisted and replaced by women.

An Inspector should be appointed to see that unskilled men get a living wage and a war bonus. (Engineering employee.)

In a certain works making machine guns, overtime had been stopped. The men were eager to work longer hours. (Anonymous.)

All the munitions wanted could be obtained, if the shame and degradation of attending at Labour Exchanges were eliminated.

The watch-making district of French Switzerland could produce an immense output of interchangeable parts or complete articles in steel or other metals. (A French Swiss.)

Loss of time could be checked by an agreement between employers and Trade Unions that men who worked shorter hours should be paid at a reduced rate. (Trade Unionist.)

The Chairman of a Company making picketing pegs complained of the waste of labour in polishing the shoes of these pegs to satisfy War Office requirements.

Many men from the Goldsmith and Jewellery Trades could do munitions work. (A goldsmith.)

A certain firm was employing only 10 per cent. of its men on Government work. The remaining 90 per cent. were prevented from seeking employment elsewhere on Government work by an agreement between the Government and other firms on Government work. (A workman.)

Pontoons should be made more roughly and economically. (An engineer.)

Thousands of Egyptian natives could be imported for munitions work.

District Enquiry Agents should be appointed to discover suitable works.

Hundreds of Dutch mechanics could be imported. (A Dutchman.)

There should be a compulsory closing of all workshops in unnecessary branches of metal trades.

Complaints about various abuses at Liverpool in the unloading of vessels, etc.

Parcels to Germany ought not to be packed in tins.

(E) Suggested Inventions.

Innumerable suggestions were received from persons of every rank and class for: the design and manufacture of rifle and body shields for infantry; armoured cars capable of crossing trenches; shells made of earthenware, glass, cast-iron, or concrete; moveable munitions and repair factories for use behind the lines; various types of shot and shell for destroying barbed wire; shells containing beer bottles, pepper, poisonous gases, or darts; respirators; means of counteracting gases; automatic carriages to convey bombs to the enemy lines; periscopic rifle sights; trench catapults; automatic aeroplanes; loopholed sandbags; poisoned bullets; discharges of "electric snuff, to make the enemy sneeze"; rubber tubes to be inserted in the boots, so that the feet could be warmed by the breath; spraying the enemy's potato crops with sulphuric acid dropped by aeroplanes; protecting our vulnerable coasts with a line of dummy trenches containing 50 million razor-edged steel man-traps; training cormorants to attack submarine periscopes and torpedoes; setting nature students to collect spindle-wood for charcoal, which the writer (a lady) had been informed was a constituent of gunpowder; and many other more or less practicable devices.

Such suggestions as seemed to deserve attention were forwarded to the proper department.

APPENDIX X.

(Chapter III., p. 38.)

Board of Trade Letter to Divisional Officers, 1 April, 1915.

(L.E.1965/125.)

Re Engineering Survey.

On 27 March I sent you a memorandum and a list of the principal armament firms. This list has now been amended by the War Office, and a copy of the revised list is enclosed for your information. As regards the placing of contracts for the manufacture of shells special difficulties are likely to arise within a radius of 20 miles from any of the firms on this revised list.

Enclosure.

List of Armament Firms.

Firm.	*Place.*
Armstrong, Whitworth & Co.	Elswick, Darlington, Alexandria, Openshaw, Manchester.
Vickers	Erith, Crayford, Ipswich, Barrow, Sheffield.
Firths	Sheffield.
Hadfield	Sheffield.
King's Norton Metal Co.	Birmingham.
Birmingham Metal & Munitions Co.	Birmingham.
Electrical and Ordnance Accessories Co. (Vickers).	Birmingham.
Birmingham Small Arms	Birmingham.
Dick, Kerr & Co.	Preston.
Cammell, Laird & Co.	Birkenhead.
Coventry Ordnance Works	Coventry.
Greenwood & Batley	Leeds.
Projectile Co.	Battersea.
London Small Arms	London, E.
Beardmore	Dalmuir and Parkhead.

Government Factories.

Royal Arsenal	Woolwich.
Royal Factory	Enfield.
Royal Factory	Greenock.

APPENDIX XI.

(Chapter IV., p. 68.)

Constitution of Local Munitions Committees.

(The following Notes were first issued about 21 April, 1915.)

War Office,
London, S.W.

Notes Regarding Appointment of Local Committees.

1. A Cabinet Committee, under the Chairmanship of Mr. Lloyd George, met representatives of the Trade Unions and, amongst other things, appointed an Advisory Committee of the Unions whose function is to deal promptly with all disputes which may arise in connection with the production of armaments and munitions of war.

2. The Advisory Committee, in order to keep in direct touch with questions arising in each district, have requested the district representatives of the Unions to appoint Local Committees who would act, as a medium of communication, with the Advisory Committee as a Central Authority.

3. These Local Committees will co-operate with the Local Committees of Employers with the view of settling promptly any questions which may arise, and, failing settlement, will invoke the assistance of the Advisory Committee.

4. The Local Committees of the Unions will nominate five or seven representatives to confer with the employers locally.

5. In each District employers are setting up Local Armament Committees to superintend the execution of orders which may be placed for armaments and munitions of war, and to secure full and effective co-operation amongst the manufacturers interested, the Factory Inspectors, the Labour Exchanges and others whose assistance would be helpful.

6. These Local Armaments Committees of Employers should also nominate five or seven representatives, who, with the five or seven representatives of the Local Committees of the Unions, will form local Joint Committees representing employers and workpeople, each side having an equal representation.

7. These Joint Committees would be available for discussion of any questions affecting labour.

8. The Employers' Local Armaments Committees will deal with all manufacturing questions, the Local Committees of the Unions will deal with all questions affecting their Members, and the Joint Local Committees will deal with questions which affect manufacturers and workpeople alike.

APPENDIX XII.

(Chapter V., p. 88.)

Admiralty Sub-committee for advising on purchase of raw materials.
(*See* M.C.446.)

The Admiralty Restriction of Enemy Supplies Committee in their 48th Report (par. 7) recommended the appointment of a Sub-committee of themselves "to advise as to the purchase of certain classes of raw materials of which the Government and their contractors may be short; for instance, copper, antimony, tungsten, and spelter."

The First Lord directed the Committee to proceed at once with the appointment, notifying other Departments concerned.

At the meeting of the Committee on 20 April, the following were nominated to serve on the proposed Sub-committee:—

Vice-Admiral Sir E. Slade,
Mr. Gauntlett (Admiralty, Contract Branch),
A representative of the Director of Naval Ordnance,
Mr. H. H. Fawcett (War Office),
A representative of the War Office (Contract Branch),
Mr. Murray (C.I.D.),
Mr. Davis (Colonial Office),
Mr. Chiozza Money,
Mr. Alan Alanson (Board of Trade).

The Board of Trade was asked to inform the Chairman (Sir F. Hopwood) if they desired to nominate a second representative.

After some correspondence, it was agreed between Mr. Runciman and Sir F. Hopwood that the Sub-committee should proceed on the condition that it was purely advisory and that its recommendations should be dealt with by the Board of Trade, War Office, and Admiralty, purchases being made by the Board of Trade or the Department concerned.

The attention of Mr. Lloyd George was called to this Sub-committee on 15 May, and he gave instructions that the matter should appear on the agenda of the Munitions of War Committee's next meeting, notice in advance being given to Sir P. Girouard and General von Donop. The matter appears to have been held up, pending the reconstruction of the Committee and the setting up of the Ministry of Munitions.

On June 11, Sir E. Slade suggested to Sir H. Ll. Smith that the Sub-committee should be transferred to the Ministry. The question was referred to Sir P. Girouard, who recommended that the Sub-committee should cease to act; but that Mr. Gauntlett should assist the Ministry with advice as to Admiralty requirements.

APPENDIX XIII.

(Chapter V., p. 90.)

Poster issued by the War Office early in April, 1915.

(*See* C.O. Circular 1795 (14.4.15) L.E. 1965/154.)

THE MAN THE ARMY WANTS NOW

to provide shells and rifle ammunition required by the Army in the field.

Fitters, turners, millwrights, and skilled workmen, also unskilled workmen not now engaged in the production of war material, can serve their King and Country by coming forward to help in providing the munitions of war of which the Army is in need.

Any volunteers for this service, which is most essential for the successful prosecution of the War, should give their names to the *nearest recruiting office*, stating what class of work they can perform.

No medical examination ; no age limits ; no measurement.

In this way men can serve their King and Country and work for their comrades in the field.

Lord Kitchener calls on all workmen to come forward and help where they can.

APPENDIX XIV.

(Chapter III., p. 43.)

The North East Coast Armaments Committee.

I. Introductory.

Investigation of Labour Position in the North East Coast District.

On 19 March, 1915, Sir Percy Girouard was requested by Lord Kitch ner to undertake an enquiry as to the possibilities of transferring labour in the Newcastle area. The district was an A Area dominated by the great armament and shipbuilding works of Messrs. Armstrong. The firm already employed 24,910 workpeople, all on Government work and working continuous time, but in order to man the new plants already constructed or in course of construction an additional 5,000 to 6,000 employees were required, a considerable proportion of whom must be skilled men. At Sir Percy Girouard's request, the Board of Trade supplied statistics dealing with the engineering and railway workshops and kindred firms in the North Eastern district. The statistics covered 54,100 employees, of whom nearly one-half were employed by Messrs. Armstrong. In he district, exclusive of Messrs. Armstrong, there were 44 firms with a total of 28,000 employees of whom 43 % were employed on Government work, and 32 % were working overtime. The remaining 1,300 men were employed by 32 small factories, 25 % being employed on Government work and 14 % working overtime.

In an interim report based on these returns (25 March), Sir Percy Girouard stated that the figures showed that there was " a considerable body of men, even in such a non-engineering district as the North East, who could be made available for munition work." He was strongly of the opinion that the first step in securing an increase of output must be to concentrate effort on the existing armament works. " To attempt an organization " he wrote " of all the various small engineering factories dotted about the North East district in preference to going on with the main factories provided by the Government would appear to be a suicidal policy. The only way it could be done would be by depleting the firms which can turn out in quantity and quality of their supervision."

From this point of view, therefore, the problem resolved itself into providing Messrs. Armstrong with the additional labour they required as soon as possible, 1,600 to 1,700 hands being required at Elswick alone.

On 30 March, Captain Percy Creed, recommended for this work by Sir Percy Girouard, was instructed by Mr. Booth to go down to Newcastle and undertake work of an experimental nature. He was

supplied with a list of the factories where, according to the information available, there existed labour of the kind required but occupied at the moment upon civil work as opposed to war material.

Lord Kitchener's letter[1] was sent to each of these firms on 29 March, and followed on 30 March by a second letter, signed by Mr. Booth, informing the firms that Captain Creed had been instructed to call upon them with reference to the special need of skilled labour for munitions, and asking them to fill up a form stating particulars of the labour employed by them, and whether they were prepared to undertake the manufacture of shells, or to transfer labour to armament work. Captain Creed was put in touch with the Newcastle Committee of the Engineering Employers' Federation (to which most of these firms belonged), with the Divisional Officer of the Labour Exchange Organization, Mr. Paterson, with Mr. Lauder of the Home Office Factory Inspection Department, and with Captain Power, R.N., the Captain Superintendent of contract-built ships (representing the Admiralty in the district) in order "to concentrate endeavours from all points on the one object in view."

At the same time, Sir Percy Girouard was asked to see that Messrs. Armstrong did their utmost to justify the special efforts that the War Office was about to make on their behalf. There was evidence that their works had grown so fast that the standard of control and supervision was not as good as formerly, and that the new men found the conditions under which they worked at Elswick unsatisfactory. It was said that 80 % of the men moved to Elswick since the beginning of the War returned to their homes after a few weeks.[2] Every effort must be made to encourage such skilled workmen as could be obtained by the War Office to remain at Elswick over the coming period of pressure. The Armaments Output Committee wished for an assurance that the output per man and per machine at Elswick was higher than in shops not regularly employed in making munitions of war.

Preliminary Work in Newcastle.

Captain Creed arrived in Newcastle on 7 April, and had interviews with Captain Power, with Mr. Paterson, who had come from Glasgow to meet him, and with Mr. Lauder. He visited Elswick and discussed the position with Sir Percy Girouard and Mr. Marjoribanks, another member of the firm. He was introduced to members of he Engineering Employers' Federation, and wrote to the local officials of all the Trade Unions concerned in the production of munitions asking them to meet him and discuss the situation. He proposed later on to make a tour of the factories, taking with him Mr. Lane, the Crown Agents' Inspecting Engineer.

On the following day, 8 April, Captain Creed had an interview with a prominent Trade Union official, Mr. Wile, President of the Federation of Shipbuilding and Engineering Trades, who had been actively engaged in transferring workers of his union

[1] See Appendix V.

[2] *Cp.* Memorandum by Mr. P. J. Pybus, above, p. 58.

(the North of England Brass Founders, Fitters, and Finishers' Society) to places where their work was most needed. He promised to do all he could to help. The Newcastle Chamber of Commerce, which had placed its services at Mr. Booth's disposal, was requested to communicate with Captain Creed.

An inaugural meeting held in the Council Chamber on 9 April, was attended by representatives both of employers and of organised labour. The Lord Mayor, Mr. John Fitzgerald, appealed to the "dormant patriotism" of his fellow citizens to accelerate the supply of munitions, and stated that he had been requested by Lord Kitchener to approach the various organisations to ascertain whether any arrangements could be made whereby work of a less vital character could be set aside in order that skilled workmen might be released for the requirements of the Admiralty and the War Office. He proposed that a representative committee, to be called "The City of Newcastle Armaments Output Committee," should be appointed to go into the matter forthwith. The suggestion of Mr. James Redhead, representing the Shipbuilders' Association, that the area to be covered by the work of the Committee should be extended to take in the whole of the North East Coast, and to cover the private and commercial yards on the Wear and Tees and at Hartlepool, Blyth, etc., was opposed by Captain Power. His view was that, though the additional labour required for Elswick might have to be obtained by the goodwill of the employers in Middlesbrough and on the Tees and Wear, it was not necessary for members of those firms to be on the Committee. It was decided, however, that these districts should be included, and the title of "The North East Coast Armaments Committee" was agreed upon.

The Lord Mayor proposed that the Committee should be composed of a representative each from the Admiralty, the War Office, the Home Office, and the Board of Trade, three representatives of employers, three representatives of trade unions, a representative of the Recruiting officer, and a member of the Newcastle Chamber of Commerce. The meeting ultimately decided that the committee was to include seven employers and seven representatives of the men.

The following resolution was carried unanimously:—"Having considered Lord Kitchener's urgent appeal for a greatly increased output of munitions of war, this meeting is of the opinion that everything possible should be done to meet the urgent requirements of the nation at the present time and pledges itself to use its best endeavours to increase the output of war munitions, and towards that end agrees that a repre entative committee to be called 'The North East Coast Armaments Committee' be appointed from the meeting to go into the matter forthwith under the chairmanship of the Lord Mayor."

Captain Creed thought the widest possible publicity essential to the success of the scheme. He obtained Mr. Booth's sanction to start an advertising campaign in the local press, which began with a full page advertisement in the *Newcastle Daily Chronicle* on April 13.

On 13 April Captain Creed and Captain Power went up to London to consult Mr. Booth and the Committee with reference to checking the recruiting of skilled men on the North East Coast, to ask for power to put pressure on recalcitrant employers under the Defence of the Realm Act, and to discuss the views put forward by the employers in the engineering trades at a private meeting with the Government representatives on 12 April.

Captain Creed was present at the first meeting of the Committee on 15 April, but went to London and thence to Glasgow, where he organised a similar committee soon afterwards. Captain Kelly, who was sent down to replace him as representative of the War Office, arrived on 17 April.

II. The North East Coast Armaments Committee.

Composition.

The Committee at its first meeting consisted of twenty-four members: the Lord Mayor, one representative each of the War Office, the Admiralty, and the Board of Trade, two representatives of the Home Office, seven representatives of the workmen, seven representatives of the employers, the Recruiting Officer, the Deputy Town Clerk, a representative of the Newcastle Chamber of Commerce, and an interim Secretary.

Subsequently other members were added: the Sheriff, the Duke of Northumberland, and Lord Durham, together with a second representative of the War Office, the Admiralty, and the Board of Trade, one more representative of the employers, and one more of the workmen. This formed the full Committee, which met on 15 April, 4 and 21 May, 29 June, 27 July, 5, 16, and 30 August.

At the meeting on 15 April three executive sub-committees—Engineering, Shipbuilding, and Ship-repairers—were appointed, each consisting of four, or three, representatives of employers and workmen, together with the representatives of Government Departments. Joint meetings of the sub-committees were held before they met separately, the chairman being Captain Power. After 4 May the joint sub-committees were known as the Executive Committee, and this body did the most important part of the work. Captain Power resigned on 29 June, Admiral Tate being appointed as the Admiralty representative.

At the first meeting, on 15 April, it was agreed that the selection of a Secretary should be left to Captain Creed and Captain Power. Captain Kelly was appointed, and he held office until 5 June, when he left to take up work at the War Office. His place was taken by Captain Ross, who had formerly been Assistant Secretary.

The office staff at Pearl Buildings, Northumberland Street, consisted of the Secretary, an Assistant Secretary, the representatives of the Home Office and Board of Trade, a Labour Exchange Manager,

a Labour Exchange Assistant Insurance officer (who was responsible for the subordinate staff and for finance), one Labour Exchange Assistant Manager, one Labour Exchange lower grade clerk, together with two filing clerks, three typists, one telephone operator, one commissionaire, and three boy scouts.

Character of the Committee.

The *Newcastle Daily Chronicle* welcomed the representative character of the Committee, which would from its composition be able to form a clear and impartial decision as to how far the continuation on private orders was compatible with the maximum output of war materials. It expressed the hope that there would be no unnecessary secrecy about the proceedings of the Committee[1], and that it would not be hampered by its association with Government Departments.

Captain Creed felt anxious about the attitude of the employers, but reported that the attitude of the workmen was most satisfactory. On 11 April the officials of the Trade Unions in the district had despatched a telegram to the Prime Minister, in which they said: "We do not want any more speeches about the failings of the workers, the employers, or the Government. We want to pull together and get on with it. You may tell Lord Kitchener that we shall deliver the goods. The working man of the North East Coast will do his bit. We hope, for our part, that you may find it possible to be present at the first meeting of the Committee." The Trade Union representatives on the Committee, Messrs. Wile, Rowe, Spence, Gilbert, Ratcliffe, Crawforth, Hebron, and Macpherson fully justified Captain Creed's expectations, and the employers, Colonel Saxton White, and Messrs. Marjoribanks, Clark, Gibb, James, Ropner, and Summers Hunter met them half-way.

A suggestion that employers and men should sit on opposite sides of the table was negatived, and the informal character of the meetings —speakers remaining seated and smoking being permitted—enabled the Committee to get through a large amount of work. The Committee as a whole was reported by Captain Kelly to be "surprisingly in accord on controversial points," and there was a general opinion that "the idea of cordial co-operation between Capital and Labour had been improved by the action of the Government in appointing the Committee."[2] The presence of representatives of Government Departments gave the Committee authority and control of the administrative machinery of the district,[3] and brought employers and men face to face with the vital needs of the situation.

---

[1] The official reports communicated to the Press were scanty, a meeting lasting six hours being summarised in six lines.

[2] *Newcastle Daily Chronicle*, 20 April.

[3] In Captain Kelly's words: "The presence of these accredited representatives of the Admiralty, the Home Office, and the Board of Trade, was of great value, and if, in addition, the Financial Departments had been represented on the Board, a most useful and a unique combination would have been effected."

III. Labour Transfer.

The activities of the Committee with regard to the transfer of labour fall into three periods, the appeal to the employers (15 April to 15 May) the appeal to the workmen (King's Squad scheme) (15 May to 30 June), and the War Munitions Volunteer scheme (30 June to 15 August), which was in the main a development of the King's Squad scheme.

Appeal to Employers to Release Workmen.

On 16 April the Executive Committee decided that all employers should be required to furnish a return of the labour employed on Government and non-Government work, and of their labour requirements for the acceleration of Government work. Forms were sent out to all the shipbuilding and engineering firms in the district. The firms were later asked to telegraph offers of immediate release.

The firms who made definite offers of release received another letter from the Committee asking for full particulars of the qualifications of the men they were willing to release. The Manager of the local Labour Exchange was instructed to call upon the employers and endeavour to get them to decide immediately which men they were prepared to release. He was then, with the employers' permission, to interview the men individually at the works, and take particular care to secure all essential particulars as to the present and past experience of each workman, where each workman had served his apprenticeship, and, in the case of machine men, the ordinary weekly rate which was then being paid. When interviewing men of the classes required by Messrs. Armstrong, the Labour Exchange Manager (who had been supplied with a list of that firm's urgent labour requirements together with particulars of rates of pay) was to explain fully the conditions of employment and rates of earnings at Elswick, but he was to explain that it could not be definitely stated that they would be transferred to Elswick, as the requirements of the employers engaged on urgent Admiralty work on the North East Coast must be considered. The workmen were to be informed that their railway fares would be paid from the place of their present employment to the employer on Government work to whom they were transferred. The men were not to be required to call at the Labour Exchange, and the Manager of the Exchange, when interviewing individual workmen, was to make it clear that he was acting as a representative of the Committee, not as a Labour Exchange official—the object being to obviate the prejudice of skilled workmen against the Labour Exchanges. Form H.L.E. 11 was to be completed by the Labour Exchange Manager in respect of each of the workmen, and sent forthwith to the office of the Committee. Apprentices were not to be included in the scheme. By 27 April 50 out of the 300 employers appealed to had undertaken to release 1,661 men.

The *Newcastle Daily Chronicle* (23 April) was officially informed that the response of the employers had been " ready and comprehensive," and the later report that the Committee was disappointed with

the response of the employers was denounced by the War Office representative as being "as mischievous as it was untrue."[1]

It is clear, however, that the Committee were not satisfied with the situation. The number of the men released for transfer was small and the difficulties in the way of transferring them to Elswick and elsewhere were great. The efforts of the Committee to overcome these difficulties may be summarised.

(*a*) *Reluctance of Employers to Release.*

On 27 April, a letter was sent to the engineering firms pointing out the urgent need for fitters and turners, and urging them to release 25 % of their workmen of these classes engaged in private work before 3 May. The employers were asked, if they were unable to transfer their men, to give their reasons, as to which they would be required to undergo examination by the Committee. The Committee decided that the Government should be acquainted with the necessity of importing from other districts, or releasing from the Army, 300 turners and 650 fitters who could not be supplied on the North East Coast, even when all available men had been taken from private work to armament work.

Already, on 18 April, Captain Power and Captain Creed had asked for authority to compel the employers to release willing men, and Captain Power wrote to Admiral Tudor on 1 May, asking for authority to insist on the release of the 25 % now called for. Captain Kelly's view was that the Committee ought to have authority, if necessary, to compel employers to give up their private work, and he urged that compensation should be given to employers whose standing charges were raised when their machines became idle by the release of their men. The Admiralty had already authorised payment to the releasing employer of from 50 to 150 % of the men's wages, according to the judgment of the Admiralty representative. He reported that one employer on the Committee, "through stress of financial circumstances," was setting the worst possible example, both on the Committee and outside.

The Committee empowered Captain Kelly to do his best by personal persuasion to induce employers to release their men. He had considerable success, but, as he himself pointed out, it was a paper success until the men were actually transferred to the Government work awaiting them.

(*b*) *Difficulties Raised by the Armament Firms.*

The attitude of the employers to whom the released men were to be transferred hampered the work of the Committee. At the outset they insisted that the usual Board of Trade employment form of application should be filled up. This difficulty was met with prompt action by the Labour Exchange officials, and Captain Kelly received some of the forms properly filled up by the men before the close of the

[1] *Newcastle Daily Chronicle*, 27 April.

committee meeting at which the objection was raised. The minute details required by the Armament firms caused delay which was prejudicial to the success of the transfer scheme.

A very large number of the men offered to them were refused by the armament firms on the ground of age, lack of skill, and so on, 521 men being rejected during the operation of the scheme. It appeared that the employers were releasing an undue proportion of inferior men.

(*c*) *Subsistence or Travelling allowance.*

This was a more serious difficulty. On 23 April the Committee had decided that men transferred to Government work at a distance from their homes should receive either a subsistence allowance (known locally as "lodging money") or alternatively, workmen's fares both ways, plus one hour's travelling time each day at overtime rates. The Government Departments concerned were pressed for a speedy decision on this point. On 23 April a promise was given, on behalf of Messrs. Armstrong, to provide travelling or subsistence allowance pending the decision of the Government; but on 1 May the firm refused 40 men who were offered on the condition that they should be paid fares and an hour's travelling time only. Owing to this refusal these 40 men had to be passed on to other employers, and the bulk of the other men released either stayed with their former employers, or were taken by Messrs. Harland and Wolff to Belfast, or by Messrs. Parsons to Dumbarton. The attitude of Messrs. Armstrong was particularly unfortunate, in view of the fact that the object of the whole scheme was to obtain more men for their works. Moreover, the Admiralty, Messrs. Palmers, Messrs. Parsons, and Messrs. Harland and Wolff were all paying these allowances. On 29 April, Captain Kelly had to report to the Committee that the War Office had decided that subsistence allowances would not be paid by the Government. The Committee was also requested not to take any action that might prejudice the Government in other districts.

This decision brought the work of the Committee to a standstill. The employers were unwilling to take the men, and the attitude of the Trade Unions, expressed by Mr. Ratcliffe of the A.S.E., was, that the War Office decision was not in accordance with the agreement between Lord Kitchener and the Executive of his Society, to the effect that transfers were to be made without infringing Trade Union rules.

The work of the Committee was suspended, and a deputation, consisting of three employers, Mr. Marjoribanks, Mr. Summers Hunter, and Mr. James, was appointed to lay its views before the War Office Armaments Output Committee, which on 30 April accepted the principle that these allowances should be paid by the Government Departments concerned.[1] The fact that the men were content to

[1] M.C. 419.

leave the statement of their case to a deputation consisting entirely of employers is a proof of the feeling of mutual confidence that prevailed in the Newcastle Committee.

On 4 May, Mr. Mosses and Mr. Hill, representing the National Advisory Committee, had an interview with the Labour members of the Committee, and afterwards met the full Committee, the object of their mission being to discover exactly what was required in the way of subsistence or travelling allowances, as the War Office and Admiralty wished to have a uniform system with safeguards to prevent abuse.

On 7 May the Munitions of War Committee decided that subsistence or travelling allowances would be paid by the Government.

Sir Percy Girouard was present at a special meeting of the North East Coast Armaments Committee on 10 May, and, at his suggestion, rules for the transference of men on the North East Coast district were drawn up. These rules were adopted by all members of the Committee except by Mr. Ratcliffe, who thought the men should be treated according to the existing rules of the Trade Unions to which they belonged. Sir Percy Girouard submitted these rules to the Munitions of War Committee on 12 May, and they were approved, subject to the following points[1] :—

1. That the words " Subsistence and travelling allowances will only be paid to men already in employment who cannot be otherwise obtained, and who are transferred to British Government work at the request of the Committee," should be added to paragraph 1.

2. That the War Office be requested to make it clear to the local Committee that the transference of men by the Committee should, as far as possible, affect skilled men and their helpers only.

3. That the fact should be recorded that, in the view of the Committee on Munitions of War, the principle laid down in paragraph 9 of the rules is unsatisfactory, and that it should not be adopted as a model in other cases without reference to the Committee.

The rules thus modified were as follows :—

1. The Committee agree that no workman shall suffer pecuniarily by being transferred to armament work, and that no attempt should be made by, or on behalf of, workmen to derive any actual profit from the country's critical position and the Government's undertaking to pay subsistence allowance, train fares, and travelling allowances as stated below. Subsistence and travelling allowances will only be paid to men already in employment who cannot be otherwise obtained and who are transferred to British Government work at the request of the Committee.

[1] Munitions of War Committee Minutes, 12 May.

2. Subsistence allowance, *i.e.*, lodging allowance at the rate of 2s. 6d. per day for seven days per week, will be paid to men brought from a distance beyond that which they can reasonably travel daily, so long as they are in the employment of the firm to which they are transferred. Railway fares will be paid for the men transferred from a distance at the commencement and completion of the work for which they were transferred.

3. When the man is within daily travelling distance, *e.g.*, Sunderland to Newcastle, the man shall receive the value of workmen's tickets and one hour's travelling time per day, at the rate of time and a half, but he should start work at 6 a.m., finishing at 5 p.m. If on night shift he shall start work at 5 p.m. and work until 6 a.m. The Armaments Committee shall take steps where necessary, to secure suitable train or tram service.

4. If, however, a man be living at Newcastle and be working at Wallsend, and he is transferred to a works in Newcastle, the Armaments Committee agree that such man shall only receive his travelling expenses, *e.g.*, tram fare from Byker or Heaton to Elswick or Scotswood, and similar cases will be considered on their merits.

5. The Armaments Committee consider that lodging money should be paid by the firm employing the man to the man, and that it should be paid weekly with his wages.

6. The Armaments Committee consider that a warrant should be issued by them to the firm for each man, stating the nature of the allowance he is to receive and the amount. This warrant should be numbered, and the firm should make a detailed monthly return to the Committee of the men transferred and the amount due to them. The Armaments Committee should certify and forward this to the Government for payment.

7. Men seeking employment in the ordinary way will receive the usual district rates, but are not entitled to subsistence allowance.

8. Should the Committee find that men have been paid off by an employer with the object of having them transferred to another part of the North East Coast district without receiving the authorised allowances, then the Armaments Committee reserve to themselves the right of deciding such a case on its merits.

9. The Armaments Committee undertake that every workman transferred shall receive the same rate, at least, as in his previous employment.

10. All men who are moved will be provided with the certificate or warrant, stating the name of the employer they are leaving and the name of the employer to whom they are going. This warrant should be issued in triplicate, one for the late employer, one for the new employer, and one for the man himself. These warrants will be issued by the Armaments Committee, and will be limited to the North East Coast district.

11. The release is to be for a period not exceeding three months in the first instance, but may be renewed by the Armaments Committee if required, subject to the approval of the Government.

Captain Kelly reported that, in the view of the Committee, the adopting of these rules would remove half the difficulties that had been experienced in getting men transferred.

(*d*) *War Office and the Admiralty requirements.*

The clashing of the Admiralty and War Office requirements was a serious difficulty. Captain Kelly suggested it could be met by instructions from the Admiralty to Captain Power to let Elswick be filled first, all surplus men being sent at once to firms indicated by the Admiralty.

Many employers who had men engaged on mercantile work refused to release them on the plea that a surplus must be kept to deal with urgent warship repairs. Captain Kelly suggested that a flying squad of ship repairers should be organised, to be controlled by the Committee and sent at short notice to any firm requiring them for work on warships.

In order to obtain the men required for Admiralty work at Messrs. Palmer's works at Jarrow and Hepburn, Captain Power was authorised by the Admiralty to demand the release of men on mercantile work. The employers were to be informed that the men would be released as soon as the urgent Admiralty work was completed. Captain Power delayed issuing this Admiralty order until he had consulted the Committee. The question was brought up on 13 May, and the general opinion of the Committee was that it was a mistake to call upon the employers to discharge the men until definite arrangements had been made for an immediate start on Admiralty work, as the transfer of skilled men had already thrown a number of unskilled men out of work.

(*e*) *Jealousy between Employer and Employer.*

Many of the employers were reluctant to release men for Elswick, as there was much jealousy of Messrs. Armstrong, whose policy with regard to sub-contracting was said to be ungenerous. There were also complaints that the Elswick works suffered from a lack of superintendence, and that men were frequently seen asleep on night shifts.

King's Squad Appeal, 15 May to 30 June.

The King's Squad scheme—a direct appeal to the workmen to leave private work for armament work—was launched by Captain Kelly at the beginning of May. It has special importance as being the forerunner of the general appeal for War Munition Volunteers, which was a development of the idea of the King's Squad.

The first reference to the scheme appears on 17 April, the day of Captain Kelly's arrival at Newcastle, when he urged that the adoption of some scheme of the kind would do away with the chief difficulties met with in the work of labour transfer.

As a preliminary step, Captain Kelly consulted the employers and the local Trade Union representatives, and, having obtained their acquiescence, planned out the details of a scheme adapted to local conditions. A mass meeting was held in the Newcastle Town Hall, at which shop delegates and two workmen from every engineering shop in the North East Coast district were present.

A draft of the proposed appeal to the workmen was approved by the Executive Committee on 6 May. At the meeting on 10 May Sir Percy Girouard stipulated that the scheme must be approved in London, but on 13 May the North East Coast Armaments Committee instructed Captain Kelly to put the scheme into operation, though the approval of the authorities had not yet been signified.

Copies of the King's Squad appeal were distributed by Boy Scouts during the dinner hour on Friday, 14 May, to nearly all the engineering and shipbuilding works in the district. The distribution continued on Saturday and Monday, and at the same time advertisements were inserted in the papers.

The essence of the scheme was to get at the men direct without the intervention either of their employers or their trade unions, though the assent of both to the scheme and a promise of hearty co-operation had been obtained. The employers welcomed the scheme as relieving them from the invidious position of giving up their men and reducing their shareholders' profits of their own accord. If the men threw up their work, the employers would have no option, and the payment of compensation would therefore be avoided.

The campaign was conducted with the object of giving the men the least possible trouble. The appeal provided a detachable coupon for signature, by which the workman undertook to place himself at the disposal of the Committee and go to such place as they might request on receipt of telegraphic instructions. The rules as to subsistence and travelling allowance were printed on the back of the coupon, and were explained to the men by their shop delegates. The appeal assured the men that they would be under no military restrictions, that the rate of wages would be at least as high as they were now earning, and that the appeal was approved by their Trade Union representatives.

As soon as the signed coupon was received by the Committee a telegram was sent to the man accepting him for munitions work and directing him to begin work without fail at a specified works, the name of the foreman and the number of the shop being stated. The man was directed to show the telegram to his employer, to his Trade Union representative, and to the local Labour Exchange manager, in order to get his railway warrant, and then to take it with him to give his new shop foreman. Previous experience had shown the Committee that a telegram was necessary to prevent any flagging after the workmen had undertaken to give up their work.

The response to the appeal was excellent. By 22 May, 2,600 coupons had been returned and 350 men had been placed. The chief difficulties in placing men were the high wages asked for, and the objections raised by some of the employers who had orders for urgent Government work on which their men would shortly be employed. In such cases the Committee solved the difficulty by informing the employers that the men who had volunteered for the King's Squad must be given to the Committee on loan, and be claimed back if the firm were occupied on urgent Government work.

If an employer chiefly occupied on private work was refractory, the Committee put pressure on him by telephone or telegraph, and the case was investigated at the works by Commander Crisp, as representing the Admiralty, together with a Trade Union delegate. On 25 May Captain Kelly reported the names of the employers who had been the most difficult, but stated that hitherto every employer had given way to pressure. The Committee was very anxious to order small private yards where no Government work was done to be closed down and the men transferred; but, on appeal to the War Office, the Committee was informed (26 May) that it had no such power.

At the date of the King's visit to Newcastle (19-20 May) the success of the King's Squad appeal was assured, and the Committee were congratulated by the King on the success of their work.

The strong point of the scheme, as compared with the former scheme, was the rapidity with which the men who volunteered were placed with the new employer. The class of men volunteering was so good that there were comparatively few rejections by the employers, and on 25 May Captain Kelly suggested the extension of the scheme to other areas.

On 21 May Captain Kelly had reported to the Executive Committee that one firm, Messrs. Armstrong, had made serious mistakes which had occasioned both delay and inconvenience to the King's Squad men coming to take up work with them, and the Committee approved of his action in stopping the supply of men to the firm until they put these matters in order. The men complained also of bad management, lack of supervision, and waste of time at Elswick. Captain Ross, who had succeeded Captain Kelly as Secretary on 5 June, reporting on the work of the King's Squad scheme up to 14 June, stated that the total number of enlistments had been 5,065. Of

these, 1,519 were the result of newspaper advertisement, and 3,546 were the result of circulars issued direct to the men. Of the men supplied, about 40% went on ordnance work, and about 60% on Admiralty work.

The approximate average cost of moving the men from their old to their new work, based on the first 600 men moved, worked out at 1s. 8d. per man, while the allowances paid for lodging money, travelling time and daily fares averaged 7s. 1d. per man, owing to the fact that many of the men preferred to claim travelling allowance instead of subsistence allowance.

On 16 June Captain Ross reported that the needs of the large firms were nearly satisfied, and that the men they needed were being supplied to the smaller firms.

When the Munitions of War Act had been passed, the King's Squad scheme was merged in the national scheme for War Munition Volunteers.

The War Munition Volunteers, 30 June—15 August.

The North East Coast Armaments Committee were anxious that their local scheme should not be superseded by the War Munition Volunteers scheme. Their view was that the changes in the conditions of transfer, though apparently slight, would cause complications if introduced in their area.

The changes objected to were as follows :—

(1) The new scheme involved an inquisition as to whether a man would have to keep up two homes.[1]

(2) The new scheme did not provide for the payment in some cases of travelling fares without travelling time.

(3) The new scheme appeared to guarantee that a man should not merely get as high a rate as he was getting before, but as high an actual sum, which would put a premium on slacking in the case of piece-workers.

On 22 June the official members of the Committee asked that the North East Coast area should be exempted from the new scheme. Captain Power went to London to lay the views of the official members of the Committee before Mr. Booth, and reported to the Committee on 29 June that practically a free hand had been secured for the North East Coast district in dealing with its own men. The King's Squad was to be merged in the War Munition Volunteers, but the Committee were to be the agents of the Ministry both for enrolment and transfer. The Ministry reserved the right, in case of an urgent demand, to transfer men from the district to any part of the country, and if desirous of bringing men into the area, the Ministry was to do so through the Committee.

[1] This was dropped in accordance with a resolution of the Trade Union Conference, moved by Mr. Wile and seconded by Mr. Hebron (both members of the North East Coast Armaments Committee) on 16 June.

All members of the King's Squad who had not yet been placed were to be invited by the Committee to enrol as War Munition Volunteers, whilst men already placed were to be asked to enrol at the end of their original three months' agreement. All transfers after June 30 were to be made on Munition Volunteer terms.

The transition from one scheme to the other had some disturbing effects in the district,[1] and there was a falling off in the number of men transferred from private to Government work. The employers objected to the obligation to pay a transferred workman the wage he was receiving from his previous firm, if this was the higher of the two. The disturbing effect was only temporary, and in the week ending 10 July, 416 men were transferred, a figure which had only once been exceeded during the existence of the King's Squad.

The uncertainty of the meaning to be attached to the term "rates" of wages in the case of piece-workers transferred from one place to another was brought up by the workmen's representatives on the Committee on 27 July. The Ministry's decision that rate of wages for piece-workers meant piece-rates and not average earnings was objected to by the workmen on the ground that, being transferred to unaccustomed work, they might be unable, through no fault of their own, to secure their usual earnings. The National Advisory Committee to which the matter was referred, decided that any case in which hardships arose might be dealt with by one of the Arbitration Tribunals provided for by Schedule I. of the Munitions of War Act.

Another point raised by the North East Coast Armaments Committee was the payment of differences in wages, where the rate was higher in the district from which the men came than in that to which they were transferred. The Committee was informed by the Ministry that the difference in the rate was to be paid by the employer, but a later Circular stated that the employer was entitled to recover the difference from the State.

By the end of July the transfer work of the Committee was almost at a standstill, as the supply of men on private work available for transfer was falling short. Captain Ross thought that future work in the district would mainly consist in moving men from one Government job to another.

Recruiting and Release of Men from the Army.

At the outset, Captain Creed urged that recruiting in the North East Coast district should be slowed down, and Mr. Booth promised that this should be done. The composition of the Committee, which included a representative of the Recruiting Officer, was some kind of guarantee that the work of getting men for the armament firms would not be hampered by recruiting appeals. Applications from employers for the release of men who had been enlisted without their permission were forwarded through the Committee. The visits of the Prime

[1] See the statistics of men transferred, below, p. 136.

Minister on 20 April, and of the King, accompanied by Lord Kitchener, on 19 and 20 May did much to impress the workmen of the district with the paramount necessity of increasing the output of munitions. Recruiting, however, went on vigorously and recruiting appeals were much more prominent in the local Press than the appeals of the North East Coast Armaments Committee. Captain Kelly, therefore, reported on 26 April and 4 May that it was of the utmost importance that the War Office should stop recruiting from among the skilled workmen on the North East Coast, 1,800 skilled mechanics having been enlisted in the Army. The War Office was also asked to instruct the recruiting officers to respect the authorised badges issued by private firms. The Committee was only indirectly concerned with the movement for the release of skilled men from the Army.[1] In July and August a considerable number of released soldiers took up work at Messrs. Armstrong's.

Labour Stealing.

During the operation of the various schemes for the transfer of men to Government work the Committee frequently found itself hampered by the labour-recruiting activity of firms situated outside the district. Thus during May there were complaints that Messrs. Harland and Wolff of Belfast were picking up men in the North East Coast district to work in their yards. At the same date men were being asked by Lord Fisher to volunteer for warship repair work at the Dardanelles. Captain Kelly was authorised to telegraph to Sir Percy Girouard protesting against action of this kind, and asking that, if men were urgently required, application should be made to the Armaments Committee.

The Three Schemes of Labour Transfer Compared.

	Men enrolled.	Accepted by Employers.
1. April 15 to May 15—Appeal to Employers ..	1,738	290 (270)
2. May 15 to June 30—"King's Squad"—		
Week ending May 22..	2,575	476
,, ,, 29..	1,007	290
,, June 5..	1,086	356
,, ,, 12..	491	204
,, ,, 12 to June 30	571	354
Total	5,730	1,680
3. July 1 to August 15—Munitions Volunteers—		
Week ending July 10..	1,211	416
,, ,, 17..	359	168
,, ,, 24..	80	84
,, ,, 31..	24	22
,, August 7..	44	28
,, ,, 14..	21	20
Total	1,739	738

[1] The Committee, however, sent recommendations to the War Office urging the release of skilled men, *e.g.*, North East Coast Armaments Committee Minutes, 23 April.

IV. The Spreading of Contracts.

The Prime Minister, speaking at Newcastle on 20 April, emphasised the fact that the first duty of the Committee was to transfer men from private to State contracts and keep the existing plant running full time on Government work. The second thing to be done was to broaden the basis of production and utilise other works in the production of munitions. From the beginning, side by side with its work of labour transfer, the Committee received and registered offers and applications of all kinds from firms and individuals, who thought they would assist in the output of munitions.

As early as 26 April two members of the Committee declared themselves in favour of distributing work rather than transferring workers, and on 30 May Captain Power asked the Admiralty to place orders with firms whose facilities were not fully occupied, and thus " accelerate output by bringing the work to the men " ; but the official policy was pursued until there was little more to be done in the direction of labour transfer.

On 3 June the employers on the Committee passed a resolution recommending a wider distribution of Government work, and on 17 June a similar resolution was passed by the whole Committee. The organisation of the West Hartlepool district for the production of munitions on a co-operative basis was being considered by the Committee on 9 June, and the Lord Mayor of Hull was consulted.

The formation of Munitions Committees at Blyth and on the Tees was discussed on 17 June, and it was arranged that these committees should be subsidiary to the North East Coast Armaments Committee.

A proposal by the Newcastle Chamber of Commerce to set up a National Shell Factory in Newcastle, to be worked in the main by voluntary labour was discussed by the Committee on 19 July, but the scheme was dropped owing to the difficulty of obtaining skilled supervision and adequate machinery. Arrangements were made to employ on special shifts at Elswick the part-time workers who had volunteered to work in the proposed factory. During August many reports as to the possibility of obtaining supplies of munitions from non-armament firms in the district were sent in by Captain Ross.

V. General Supervision of Labour Conditions.

The composition of the Committee gave it great authority in the district. It was able to put pressure on both employers and employed, and the powers under the Defence of the Realm Act possessed by the Admiralty and the War Office gave quasi-legal authority to the recommendations of the Committee containing their representatives. As time went on, the Committee began to be regarded as having general supervision of labour questions throughout the district, and to its primary work of labour transfer were added the functions of a general Court of Appeal having great local authority. Its activities in this direction must be illustrated rather than described in detail.

Relations with Liquor Control Board.

The indignation aroused in the Newcastle district by the publication of figures given by the Federated Shipbuilders to Mr. Lloyd George about the loss of time due to the drinking habits of the men was reflected on the Committee, one of whose members characterised it as a "most wicked slander,"[1] and the local Press thought one of the chief objects of the Committee was "to send to London a clear and impartial statement as to how far the consumption of alcoholic liquor is interfering with the regular working of the shipyards and factories." The Boilermakers' Society thought the charges should be investigated by the local Armaments Committee—a further evidence of the workmen's confidence in the Committee.

Representatives of the Committee attended a meeting of the Central Board for Liquor Control, in London, on 29 May, and made recommendations as to special facilities for men employed in blast furnaces and rolling mills, the abolition of "treating," and so on, some of which were accepted by the Board. A conference at Newcastle, between the Committee and the local authorities was held on 14 June, followed by a conference with the Central Control Board on 21 June, which resulted in certain agreed proposals being adopted. On 30 August the Committee reported that the regulations for the North East Coast were causing discontent among the Steel workers, who, in consequence, were working less time.

Trade Union Restrictions.

On 26 April the Committee unanimously decided that all possible efforts should be made to accelerate production, and throughout its existence the Committee acted in the spirit of this resolution, by encouraging the adoption of piece-work, sanctioning the employment on drillers' work of non-drillers, subject to the Treasury Agreement being signed by the firm,[2] and so on. The chief difficulty in the adoption of piece-work was safeguarding the poorer classes of workmen against injury. In the case of the Brass Founders, the Trade Union delegate could not persuade his men to abandon the unwritten Trade Union law known as "shop-figure," and to accept piece-work, but the men expressed their willingness to accept piece-work if they were definitely advised to do so by the Committee.

Travelling Facilities.

The Committee did useful work in putting pressure on the railway companies and the Corporation to improve the train and tramway services used by workmen going to and from Government work, and the minutes of its meetings show what was accomplished in this direction.

---

[1] *Newcastle Daily Chronicle*, 20 April, 22 May; North East Coast Armaments Committee Minutes, 6 May.

[2] The object of the Trade Union officials was to supplement the agreement made with the Chancellor of the Exchequer on 19 March by additional agreements to be entered into by each firm.

Housing Schemes.

The Committee had close relations with the local Housing Committee, and the problem caused by the large increase in the number of men employed at Elswick during April, May, and June was solved by the use of billets vacated by troops going under canvas, of public buildings, and of houses on the sea coast vacated owing to the fear of naval raids, and by an appeal to local residents to take in lodgers. Accommodation for 7,000 workers was thus provided.

Bad Time-keeping.

The Committee took a strong line on this question. Its recommendations, and the appointment of vigilance committees in the workshops were very favourably received. Captain Power urged the Admiralty to give the Committee power to fine offenders. New rules as to late arrival at work were suggested by the Committee on 27 July.

Holidays and Race Meetings.

The action of the Committee in prohibiting local race meetings was unpopular but effective, but its appeal to the workmen and the general public to forgo the Whitsuntide holiday was unsuccessful, in spite of strong support from the local Press.

Trade Disputes.

As early as 3 May it was reported that the Committee was being used as a Court of Appeal to settle trade disputes between employers and men arising in the district. In several cases, when disputes threatened to check the output of munitions, Captain Power or Captain Kelly, asked by the Committee to approach the firms involved, succeeded in settling the question. The Committee was so successful that on 3 June the representatives of the employers on the Committee passed a resolution, which was presented to Sir Percy Girouard by Captain Power, asking that Armaments Committees should be authorised to settle trade disputes in munition work. Captain Power was informed that such powers could only be given by the Cabinet. A number of trade disputes were brought before the Committee during the last two months of its existence, its decisions being generally accepted. On 19 July the Secretary was instructed to inform the Ministry of Munitions that, in the opinion of the Committee, the employer and trade union members of the Committee should be put on the Munitions Tribunals for the district.

VI. Supersession of North East Coast Armaments Committee.

In consequence of the administrative changes introduced by the Ministry early in August, an emergency meeting of the North East Coast Armaments Committee was called on 5 August, and a deputation

was appointed to wait on Dr. Addison. A letter was written by the Minister to the Lord Mayor on 10 August, which explained the position, and on 16 August, Mr. McLaren attended a meeting of the Committee to give an account of the intentions of the Ministry with regard to the future organisation of munitions work on the North East Coast. Several members of the Committee strongly deprecated the action of the Ministry in dispensing with the local knowledge possessed by the Committee and in entrusting the executive powers entirely to three officials. The Labour members were reluctant to remain on a Committee shorn of executive, and retaining only advisory functions. The dissatisfaction of the Labour representatives with the new arrangements was still more strongly expressed at the final meeting of the Committee on 30 August, which marked the close of an interesting and successful experiment.

APPENDIX XV.

(CHAPTER III., p. 43.)

The Glasgow and West of Scotland Armaments Committee.

I. Composition of the Committee.

Captain Creed left Newcastle about 16 April, 1915, to organise a similar Armaments Committee for Glasgow and the West of Scotland. Between 20 April and 30 April he met representatives of the employers and Trade Unions in the shipbuilding and engineering trades and the Committees already appointed by the Glasgow Chamber of Commerce and the North West Engineering Employers' Association. On 30 April the Glasgow and West of Scotland Armaments Committee was established, under the chairmanship of the Lord Provost of Glasgow.

The Admiralty was represented by Captain Barttelot,[1] the War Office by Captain Creed, the Home Office by Mr. Williams, and the Board of Trade by Mr. Cramond. There were 16 representatives of shipbuilding and engineering employers and 16 representatives of the Trade Unions. Mr. Paterson of the Board of Trade was appointed Secretary. The full Committee of 38 members was too large for practical purposes and most of the work was delegated to sub-committees. Each of these sub-committees, of which there were at first two, and finally six, consisted of two employers, two workmen, and the Secretary. All the representatives of Government Departments had the right to sit on the sub-committees.

The Labour Sub-Committee, for "procuring labour for Government work from firms engaged on private work," and the Shell Sub-Committee, to "increase the output of shell in the district," were formed on 3 May, and frequently sat together as the Joint Sub-Committee on Labour and Shell. To these were added, after 2 June, four other sub-committees—for Volunteer Labour, for Trade Disputes, for Finance, and for Business purposes.

II. Labour Transfer.

The work of the Committee in connection with labour transfer followed the Newcastle precedent, but was less successful.

A summary of 20 May showed that in the Glasgow and West of Scotland district there were 73,120 men employed on War Office or Admiralty orders, and 22,751 were employed on private orders. It was estimated that 6,761 additional men were required for Government work, a number which it might have seemed easy to obtain from the large number of men still employed on private work, though the supply of certain classes of labour—plating, riveting, and angle smithing—was already very short.

[1] Admiral John E. Bearcroft was appointed as Admiralty representative vice Captain Barttelot on 29 June.

Appeal to Employers, 3 May—10 June.

As at Newcastle, all the engineering, shipbuilding, and boat-building firms in the district were asked to furnish the Committee by 7 May with particulars of the labour employed on Government and on private work. On 11 May, the Admiralty representative, Captain Barttelot, submitted to the Committee a statement of the requirements of those shipbuilding firms to which he wished preference to be given for any labour which might be available. The Committee then ordered that five shipbuilding firms[1] should be called upon to release, within a few days, a definite number of workmen in each of the classes required for the acceleration of urgent Admiralty work. Six other firms were asked to send representatives to appear before the Committee and discuss the position. On 13 May, when the employers appeared, they were told that all their carpenters and iron workers would be required for Admiralty work, and that the foremen were to go with the men whenever possible.

On 15 May a War Office preference list, similar to the Admiralty preference list, was sent to the Committee by Sir Percy Girouard.

The payment of a subsistence allowance of 17s. 6d. a week to all workmen called upon to move to other districts in order to take up Government work had been decided upon by the Labour Sub-Committee on 5 May after consultation with Mr. Mosses of the National Advisory Committee. On 12 May the rules as to travelling and subsistence allowances drawn up by the North East Coast Armaments Committee were communicated to the Glasgow Committee by the Army Council, and were adopted on 14 May, with slight alterations to suit local conditions.

Thus all the machinery for labour transfer was in readiness, but the Committee only succeeded in transferring a very small number of men.[2]

On 16 May the Committee instructed the Secretary to issue requisitions to firms for the labour required, which was to be available at an early date. It was obvious that, if these requisitions were not complied with, the Committee had no power to compel obedience. On 21 May, therefore, a deputation of the Committee, consisting of the Lord Provost, two representatives of employers, and two of workmen, submitted a memorandum to Sir Percy Girouard and the Third Sea Lord, in which wider powers were asked for. With a view to increasing output, the Committee urged that it should be given power to settle trade disputes, remove existing trade demarcations which hampered output, and " to call before the Committee or sub-committee thereof, employers, Trade Union officials, or other persons,

[1] Some of these firms were very important merchant shipbuilders, who, in less than a year, were put on the Priority List for Labour. It is, perhaps, fortunate that the Armaments Committee did not entirely disorganise them.

[2] According to the Minutes of the Committee, 82 men had been transferred by 4 June (D.A.O./Area 9/509), but the number transferred by 9 June is given elsewhere as "just over 60 men."

and to compel them to observe the instruction of the Government representatives. . . . . It appears to the Committee that if the necessary statutory authority does not already exist, immediate steps should be taken to secure that the Government representatives on the Armaments Committee are vested with summary powers to deal with such cases, and that these powers be supported by substantial penalties for non-observance."

The Committee also asked that Section I. (1) (*d*) of the Defence of the Realm (Amendment) No. 2 Act should be amended so as to bestow upon the Admiralty and Army Council and upon their representatives on the Armament Committees, the power of transferring workmen from one establishment to another. This would give legal sanction to the requisitioning of workmen by the Committee, and would protect employers whose workmen were requisitioned from any action or proceedings that might be taken against them for non-fulfilment of contracts.

In addition, the Committee asked for power to draw labour from other districts—Aberdeen, Edinburgh, and the North of Ireland —and to apply the subsistence and travelling allowance rules to apprentices as well as workmen. With reference to finance, the Committee thought that there would be "a good deal of exceptional expenditure which will require to be incurred on short notice, and it does not appear that it will be possible for this to be controlled on the usual Government lines. . . . . It seems that the proper course will be for the Committee to be supplied with funds by, and be responsible direct to, the Treasury."[1]

At the same time, the Committee requested to be furnished with an immediate statement of the requirements of the Admiralty and the War Office for various kinds of shell.

The deputation was unsuccessful. Sir Percy Girouard informed them that the powers they desired could only be conferred by the Cabinet, and that the Committee must not attempt to transfer labour outside its own district.

In the opinion of Sir George Askwith,[2] the suggestion that the Glasgow Armaments Committee should settle trade disputes was "most undesirable, and, if endorsed, fraught with the gravest consequences. . . . . The composition of these Committees is largely partisan, and any question of moment would certainly lead to a taking of sides and to an extension rather than a narrowing of the controversy." He thought that the workmen would not favour their grievances being settled by members of other Trade Unions,

[1] On 23 June it was decided that the past expenditure of the Committee should be audited by Mr. Duckworth of the Finance Department of the Ministry. The expenditure included the payment of two of the representatives of the workmen on the Committee for their services, as they had no time to work at their trades.

[2] Memorandum by Sir George Askwith. (28 May, 1915.) Hist. Rec./R/. 1121.32/6.

as was shown by the fact that during the engineers' strike on the Clyde, neither the men nor the officials of the Amalgamated Society of Engineers would allow Mr. Henderson, M.P., Mr. Hodge, M.P., or their own member, Mr. Barnes, to address them. He was also doubtful whether employers would be willing to send questions to these Committees, and go before a tribunal, of which (as he said) half was frankly partisan, and the other half afraid of taking a strong line for fear of reprisals.[1]

With regard to the claim of the Armaments Committee to have settled a dispute at Messrs. Nobel's Explosives Co., Sir George Askwith stated that the dispute in question had subsequently been referred by the firm to the Committee on Production. The handling of industrial disputes should be referred to one Department; otherwise great confusion would arise. The Armaments Committee would find ample scope for its activity in dealing with "questions of demarcation and the abandonment of Trade Union rules and customs which retard output and limit the application of suitable labour."

On 28 May, the same deputation was received by Mr. Lloyd George. Its report to the Glasgow Committee was that "the result of the interview was disappointing, as Mr. Lloyd George was unable to give any immediate pronouncement other than that he would place the matter before the Cabinet at an early date for their most careful consideration." The Lord Provost took the view that refusal of such powers would entail "a total suspension of the Committee's work, and would create such a want of respect and confidence for the Committee's functions and powers as no subsequent action would remove."

In the expectation of obtaining these further powers, the Glasgow Committee had contemplated closing certain shipyards in order to transfer labour to Government work; but on 4 June, on receipt of a letter from Mr. Booth, deprecating such action by the Committee, the firms involved were informed that the question of closing their yards was in abeyance for the time.

The Committee did not, of course, succeed in obtaining the powers for which it had petitioned.

War Squad Appeal, 10 June.

On 4 June the Committee decided to issue an appeal to workmen to form a "War Squad or Flying Column of Armament Workers" on the lines of the King's Squad formed on the North East Coast. The appeal was slightly amended to suit local requirements, and it was advertised in the Press and elsewhere. As in Newcastle, the appeal was signed by representatives of the Shipbuilding and Engineering Federated Trades Unions. It was issued on 10 June, and 6,500 men were asked for. By 12 June over 2,000 applications for enrolment had been received, and by 14 June the number had risen to 4,500. Half the applications, however, were from unskilled men, while, among the skilled men, there was a surplus of applications from men

[1] See p. 52.

in certain trades, and very few applications from riveters, who were urgently required. Though the number of enrolments reached 9,755 by 15 July, only 1,320 were offered to employers and only 454 had been accepted by them at that date.

War Munitions Volunteers, 30 June to 15 August.

The Glasgow area, like the Newcastle area, received exceptional treatment under the War Munitions Volunteers Scheme. The Local Committee continued to deal with members of the War Squad who did not wish to enrol in the War Munitions Volunteers, while members of the War Squad who wished to join the National scheme ceased to be under the jurisdiction of the Committee, unless they had already been transferred to Government work.

Release of Men from the Army.

The procedure to be adopted by employers desiring the release of men from the Army was laid down in a set of instructions drawn up by the Glasgow Committee on 8 June and issued to employers in a circular letter.

III. Organisation of Munitions Production.

The Spreading of Contracts.

From the beginning, the Glasgow Committee took a strong line on the necessity for distributing Government orders among the firms in the district who were capable of transferring their resources to the production of munitions. On 3 May, 14 May, and in their memorandum of 21 May, the Committee had asked for a full statement of War Office and Admiralty requirements for shells, with specifications and, if possible, samples. The Committee was confident that it could bring to the notice of the Government new sources of supply, many firms being dissatisfied with the negative results of offering their facilities direct to the War Office and Admiralty. Many offers from manufacturers and requests for Government orders had been made direct to the Committee, but the Committee had been obliged to refuse them owing to the fact that it had no control over the distribution of Government orders. On 31 May, Messrs. Weir, while announcing that they proposed to devote to the Red Cross all profits from the manufacture of shells under existing Government contracts, had informed the Committee that their shell plant would be available on the termination of these contracts, for the production of shell for the Government at nett cost.

Schemes for a National Shell Factory and Co-operative Work.

On 21 May Sir Percy Girouard had requested Mr. Rowan Thomson, a member of the Deputation to him, to place before the Glasgow Committee proposals for a National Shell Factory on lines similar to those started at Leeds and elsewhere. The question was remitted by

the General Committee to the Shell Sub-Committee who appointed three engineering employers, Messrs. William Weir, R. McLaren and W. B. Lang to investigate and report. Mr. Weir was from the first unfavourable to the scheme. His point of view, as given in a conference with Mr. Stevenson on 25 June, was that, apart from the delay of several months, which must be expected before a National Shell Factory could start production, increased production at firms' own works by putting down further equipment was the best means of organising resources. Most firms in Glasgow were working in connection with Admiralty contracts, but three at least—his own, Babcock and Wilcox, and the North British Diesel Co.—had been turning out and delivering shell since 1914.

At the request of Mr. Stevenson, Mr. Weir immediately after this interview outlined a scheme for production. This scheme definitely rejected the idea of a National Factory and replaced it by a proposal that a local Board of Trustees, appointed by the Ministry, should arrange for the production of 200,000 18-pounders, 100,000 4·5-inch and 80,000 6-inch shell from the area. The work was to be divided among five or six firms ; a price for each size of shell was to be settled by the Ministry and was to include a definite amount per shell for capital expenditure, calculated on the quantities finally ordered from each firm.

Mr. Stevenson met representatives of the Committee at Glasgow on 28 June and discussed the matter. He suggested the possibility, which was favourably received, of an Assembling Factory as a compromise between a National Shell Factory and the extension of direct contracts.

On 1 July a report embodying the main features of this scheme[1] was presented to the Glasgow Committee by whom it was unanimously adopted and forwarded on 2 July to Sir Percy Girouard. Though no action was taken for the moment, these recommendations were not without influence on the subsequent organisation of the area, which was settled after consultation with Mr. Weir, who became Scottish Director of Munitions.

IV. Supervision of Labour Conditions.

Like the Newcastle Committee, the Glasgow Armaments Committee exercised a general supervision over labour conditions in the area. Its minutes record its activity in connection with trade disputes, the aim of the Committee being to act as arbitrator. It succeeded in obtaining the withdrawal of some trade demarcations, which enabled ship-joiners to work as shipwrights, iron moulders to work as brass moulders and brass founders. It drew up a schedule of figures as to the output which ought to be obtained on a ten-hours shift from certain machines ; it urged certain trade unions to allow the introduction of piece-work ; it considered allegations of labour stealing ;

[1] The proposal in the Report was for 200,000 6-in. and 200,000 4·5-in. shells.

dealt with the housing difficulty; issued notices restricting the Fair Holidays, which usually lasted a fortnight, to six days; considered the Liquor Traffic regulations drawn up by the Central Control Board; and urged the Glasgow tramways to introduce a universal fare for workmen.

A scheme for punishing bad time-keeping, adopted by the Committee on 14 May and accepted by the National Advisory Committee on 26 May, imposed fines not exceeding £1 for the first offence, £2 for the second offence, and £3, together with dismissal, for the third offence. In the case of trade unionists the fines were assessed by their unions; in the case of non-unionists, by their employer, with a right of appeal to the Armaments Committee.

V. Supersession of the Committee.

On 28 June, when Mr. Stevenson met the Glasgow Committee, he outlined the scheme of decentralisation then under consideration, and stated that it was the desire of his Department that the Committee should be taken over as the district munitions organisation of the Ministry.

In his letter of 21 June to Mr. Lloyd George, drafting a scheme of Area Organisation to be applied throughout the United Kingdom, Mr. Stevenson had suggested that use might be made of the organisation already in being at Glasgow. "It might, of course, be necessary to extend the existing organisation by augmenting its staff, that is to say, by increasing the number of representatives who will travel throughout Scotland on behalf of the Department in an engineering, inspecting, and information-giving capacity."

During July the work of establishing an Area Office in Glasgow was carried out, and though use was certainly made of the existing administrative machinery of the Glasgow Armaments Committee, its functions tended to become increasingly limited. The premises which served the Committee as offices were adapted to the purposes of the Area Office. Mr. Paterson, their Secretary, was early in July appointed Organising Secretary to the Area, and continued to act in the dual capacity throughout July. Certain other officials too, who had originally been lent to the Glasgow Committee by the Board of Trade, were now transferred to the Area Office.

A letter from Mr. Lloyd George to the Lord Provost on 30 July announced that with the formation of a Munitions Area it would "no longer be necessary to continue the activities of the present West of Scotland Armaments Committee otherwise than as a consultative Committee." The Lord Provost suggested that the Committee should be dissolved forthwith, but was told in reply that Mr. Lloyd George would prefer it to remain as a consultative body, as this would bring the district into line with the rest of the country.

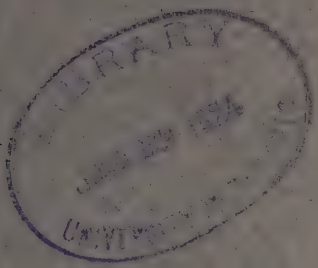
However, with the appointment in September, 1915, of a Board of Management for Glasgow, which was itself purely advisory in character, the last functions of the Committee disappeared and it henceforward ceased to meet.

Reviewing the work of the Committee, it appears that its comparative failure was not due to friction between the representatives of employers and men. What evidence there is points to the existence of cordial relations between them, and the complaint made by the Workers' Union of Glasgow, on 12 August, that, owing to the short notice given of the preliminary meeting, the Committee was not representative, appears to be groundless. Nor was it due to inactivity. The Minutes of the Committee are a record of ceaseless activity in every direction. It intervened in trade disputes, summoned employers and men to appear before it for interrogation and examination, sent deputations of its members to workshops to watch engineering operations and draw up a scale of output, broke down trade demarcations, and so on. In all these directions the Committee had some success at the outset which encouraged it to still greater activity. But when those who resisted the decisions of the Committee discovered that it had no power to enforce them, the prestige of the Committee declined and with it its success. The refusal of the Government to endow it with compulsory powers which would have involved an amendment of the Defence of the Realm Act put an end to the ambition of the Committee to act as a general court of appeal for the whole area.

INDEX.

CONFIDENTIAL.
For Official Information only.

HISTORY OF THE MINISTRY OF MUNITIONS



VOLUME I

INDUSTRIAL MOBILISATION, 1914-15

PART IV

THE MUNITIONS OF WAR ACT, 1915

Volume I

INDUSTRIAL MOBILISATION, 1914–15

PART IV

THE MUNITIONS OF WAR ACT, 1915

PART IV.

The Munitions of War Act, 1915.

APPENDICES.

INDEX.

(474) Wt. 3643/A.P. 5036 10/18 250 D.St.

PART IV.

THE MUNITIONS OF WAR ACT, 1915.

1. Introductory.

The Ministry of Munitions entered on its legal existence on 9 June, 1915. Before this date the Bill which was to invest it with a large part of its powers was already being prepared. The Munitions of War Bill is defined in its title as a measure "to make provision for furthering the efficient manufacture, transport, and supply of munitions for the present War, and for purposes incidental thereto." Its real purport was more exactly expressed by Lord Curzon, when, in moving the Second Reading in the Upper House, he described it as empowering the Minister "*to organise the skilled labour of the country* for the production of munitions of war."[1] Its provisions are, in fact, directed to the control of labour; and such disabilities and limitations as are imposed by it upon the employer are to be understood as a means to that end.

The measures that have been described in the earlier pages of this volume fall into two groups, under the headings: (*a*) the supply and movement of labour, and (*b*) labour regulation. To the former group belong the special efforts made to direct the flow of highly skilled labour towards munitions work, and certain compulsory enactments which mark the beginning of Government control over this movement. Under the head of regulation fall the attempts to secure that labour already employed should work continuously and at full power. Here, the two main questions were: the settlement of disputes without stoppage of work, and the suspension of restrictions limiting output. In respect of these, no advance had yet been made beyond the stage of voluntary agreement, reached at the Treasury Conferences in March.[2]

The general purpose of the Munitions of War Act was to carry the progress of Government control over the workman's normal freedom under both heads as far as the exigencies of war production demanded and the state of feeling in the Labour world would allow. In order to measure the step now taken, it will be convenient to review the position already reached and the ways that had led to it.

---

[1] *Parliamentary Debates* (1915), *H. of L.*, XIX., 206.

[2] See Part II., Chap. IV.

(*a*) The Supply and Movement of Labour.

It has been shown that the question of labour supply for armaments and the wider problem of man-power in general had arisen in the winter months of 1914.[1] The two main causes of shortage were the sudden expansion of the demand and the unrestricted enlistment of the very men who were wanted for the new factories. Only the second of these causes admitted of any remedy. There were two possible expedients: to hinder more skilled men from enlisting by giving them the protection of badges, and to recall from the ranks men who ought never to have left the bench and the shipyard. In the absence of a Military Service Act, there was no real power to take effective action in either of these ways. No man could be compelled either to join the Colours or to leave them; and, so long as the whole matter rested with the War Office, the active propaganda of the recruiting officer went on all over the country, practically unchecked, while the regimental officers could hardly be expected to speed the departure of some of the best soldiers in their battalions and companies. Short of introducing a Military Service Act, which the country was not yet ready to accept, the only remedy was to take Badging and Release from the Colours, so far as possible, out of the hands of the War Office and to transfer the working of both schemes to the new Ministry, which had an interest in making them effective.

The Munitions of War Act (Section 8) empowers the Minister to make rules authorising the wearing of badges. The Act does not deal with Release from the Colours, this being a matter which could not be formally removed from the military authorities; but the Labour Branch of the Ministry inherited from Mr. Booth's Committee a Section whose duty was to press for the interests of munitions work in this direction. So far as Government control is concerned, no advance was possible while enlistment remained voluntary. Every man retained his original freedom to serve in the Army or in the factory, as he thought best.

The earliest measures of compulsion had been taken in the sphere of the diversion of labour from private work. They were a direct consequence of the Board of Trade campaign carried on for this purpose in the first quarter of 1915, and the need for them had become apparent from the employers' reaction against the appeal made to them to surrender to the armament firms a proportion of their best hands.[2] The two enactments in question are: the Defence of the Realm (Amendment) No. 2 Act of March, 1915,[3] and Regulation 8B (April, 1915), which prohibited the employer from enticing labour from a distance.[4] In each case the form of the enactment somewhat disguises the real intention underlying it. In the Act no mention is made of labour from first to last; and the Regulation was so worded as to impose its prohibition only on the employer.

Both enactments were designed to regulate the movement of labour, and they restricted the normal liberty alike of employer

[1] See Part II., Chap. I. [2] See Part II., Chap. I.
[3] See Part II., Chap. III. [4] See Part III., Chap. V., Section VII.(*b*).

and of employed. They attacked the freedom of the employer to carry on what work he pleased for the greatest profit, and to attract labour by higher wages or other means. They attacked the freedom of the employee to sell his labour at the best price, and to work where and for whom he chose. It is here that Government control begins.

The two measures are complementary. The Act aimed at diverting labour into the channel of munitions production by the indirect method of extinguishing the competition of commercial work. The Regulation, on the other hand, was to hinder labour from moving away from munitions work in one place to work, whether for public or private purposes, in another. Under the Act, labour was to be moved to the place and the type of work where it was most wanted. The object of the Regulation was to keep it there for so long as it was wanted. In both cases, however, besides the indirectness of the method employed, the terms were comparatively mild ; and, in proportion as they proved ineffective, little opposition was aroused.

The sections of the Munitions of War Act which bear on these points are Sections 10 and 7. Section 10 strengthens the Amending Act of March by adding to the power of regulating or restricting the carrying on of work in any factory or workshop, the power to regulate or restrict "*the engagement or employment of any workman or all or any classes of workmen therein.*" This was a move in the direction of the compulsory transfer of workmen from one establishment to another, though no power was taken to assign the men displaced from one establishment to work elsewhere without their own consent. The amendment was also intended to bring Regulation 8 B *intra vires*. But the Regulation itself was practically superseded by Section 7, which provided a more effective means of tying the munitions worker to his employment by the institution of leaving certificates. This was the most drastic restriction of normal liberties contained in the Act, and, while Section 7 has been described as the most powerful instrument of industrial efficiency which the War has produced, in practice it gave rise to discontent which could only be finally allayed by its repeal.

The new Act thus tightened the control of the Government over the mobility of labour, both in the way of directing it to Government work, and of preventing it from moving away again of its own accord.

The Act further facilitates the desired movement of labour by the institution of War Munitions Volunteers. Section 6 provides for workmen entering into a voluntary undertaking to work at a controlled establishment. After giving this undertaking, the man became subject to certain penalties if he failed to carry it out ; but the initial step was a purely voluntary act on the workman's part. As will be seen later, the compulsory enrolment of employees at controlled establishments was at first contemplated ; but this project had to be abandoned before the Bill was introduced.

(*b*) Labour Regulation.

Up to the passing of the Munitions of War Act no compulsory measures existed to limit the workman's freedom (1) to stop working

by a strike pending the settlement of a dispute, (2) to work as few hours as he pleased, or (3) to maintain those restrictive rules and practices which limited output. The Munitions of War Act dealt with all these three points.

(1) With regard to strikes and lock-outs, the first step had been taken by the Committee on Production in February, when labour troubles, which had died down in the earlier months of the War, broke out in a serious form. The Committee procured the issue of the Government *Notice* (21 February) which declared that "no stoppage of work by strike or lock-out should take place on work for Government purposes," and that differences which could not be settled by the parties under existing agreements "shall be referred to an impartial tribunal nominated by H.M. Government for immediate investigation and report to the Government with a view to a settlement." The Committee itself was empowered to act as the tribunal indicated. This *Notice* did not, of course, bindingly prohibit strikes and lock-outs, and no penalty was attached to non-compliance with the direction that disputes should be referred.

In March, Mr. Lloyd George was inclined to take the further step of including in the Amending Act clauses prohibiting strikes, lock-outs, and incitement thereto. It was considered, however, that the time was not ripe for strong measures, and these clauses were struck out in draft.[1] The Government took the alternative way of negotiation with the Trade Unions.

In the Treasury Agreement, the workmen's representatives pledged themselves to recommend to their members that

> "during the war period there shall in no case be any stoppage of work upon munitions and equipments of war or other work required for a satisfactory completion of the War."

The Agreement further specified three alternative tribunals of arbitration, to which differences which could not be settled under existing agreements might be referred.

Part I. of the Munitions of War Act covers the same ground as this portion of the Treasury Agreement.

(2) The freedom of the workman to limit the number of hours worked, to refuse overtime, and to stay out whenever he pleased, inasmuch as it was not a matter of organised or collective action, but a purely individual concern, could not be restricted by direct Government intervention without recourse to measures that were likely to be resented as oppressive. Evidence will be produced later to show that the accusations of bad time-keeping freely levelled in the Press against engineering workmen at this time were exaggerated, as well as injudicious.[2] The evil, however, certainly existed, and the only course hitherto open to the Government had lain in an indirect attack upon the various forms of temptation which conduced to it. Under the Defence of the Realm (Amendment) No. 3 Act (19 May, 1915) the

[1] See Part II., Chap. III.

[2] See below, p. 45.

Government had taken power to control the liquor trade in any area, on the ground that munitions work was being carried on there. The prohibition of race meetings, football matches, and other distractions, had been mooted from time to time, but no legal powers had yet been assumed for such purposes.

The first sketch of the Bill drawn up at the Board of Trade on 1 June[1] included the suggestion, made by Captain Power of the North East Coast Armaments Committee, that power should be taken "to prohibit the holding of any public sports, races, or other meetings calculated to interfere with the continuity of work for war purposes." It was, however, considered that bad time-keeping could not be effectively checked by indirect methods.

The Munitions of War Act contains the first attempt to deal with the matter directly. The tribunals of one of the two classes set up by Section 15 were principally intended to mitigate this evil. Their powers were, however, limited to the infliction of fines on the employees of controlled establishments.

(3) Trade Union restrictions had the effect of limiting output, in some cases directly, in others indirectly, by the barriers of demarcation or by excluding unskilled labour from the higher forms of work and so making it impossible to supplement by "dilution" the depleted ranks of the highly skilled. In the engineering industry, the old method of joint conferences had led to some measure of success in the Shells and Fuses Agreement of March.[2] With the appointment of the Committee on Production the second stage—Conciliation—was reached, and at this point the counter-demand of Labour for the limitation of employers' profits emerged. In the retrospect, it appears unfortunate that the question of excess profits should have been thus closely linked with the suspension of restrictions. Probably it would now be universally admitted that the taxation of war profits ought to have been dealt with at the outset on its own merits and applied at once to every form of what is now called profiteering. The opportunity was lost owing to the acute anxiety of the Government to accelerate the production of munitions. Since it was only in the field of War Office and Admiralty work that the suspension of restrictions was immediately desired, and only in this field could there be any question of "taking over" the establishments concerned, the limitation of profits came to be looked upon as a *quid pro quo* and confined to the same class of work. The pledge embodied in the Treasury Agreement of 25 March with the Amalgamated Society of Engineers ran as follows:—

> "It is the intention of the Government to conclude arrangements with *all important firms engaged wholly or mainly upon engineering and shipbuilding work*, under which their profits will be limited, with a view to securing that benefit resulting from the relaxation of trade restrictions or practices shall accrue to the State."[3]

---

[1] *Heads of Labour Policy* (1/6/15), Hist. Rec./R/300/38.

[2] See Part II., Chap. II.

[3] See Part II., Chap. IV.

In June, this pledge had not yet been redeemed. After prolonged negotiations with the armament firms it had been discovered that there was no legal power to redeem it.[1]

Part II. of the Munitions of War Act was designed to provide the necessary powers and to sanction the rest of the bargain struck at the Treasury Conferences. It creates the "controlled establishment," which is essentially an establishment within which the terms of the Treasury Agreement, including the suspension of restrictions and the employers' guarantee to restore them at the end of the War, are enforced, together with the limitation of profits. The control exercised over labour under the provisions relating to controlled establishments, which include power to make regulations "for the general ordering of work" therein, with a view to efficiency and the due observance of rules, depends on the willingness of the workman to enter into an undertaking to work there. No man could be compelled to take employment at a controlled establishment, unless he had already given this voluntary undertaking.

II. Sections 1-3. The Settlement of Disputes.

Part I. of the Act provides for the settlement of labour differences, for the prohibition of strikes and lock-outs in certain cases, and for arbitration, which on certain conditions is compulsory.

The understanding reached at the Treasury Conference with regard to stoppage of work had remained to a large extent a dead letter. This failure was attributed to the fact that the Agreement was only an expression of opinion—a recommendation—not a definite instruction entailing penalties for non-observance. The machinery for the settlement of disputes had been destroyed by war conditions; and it was considered that the time had come for the Government to lay down rules binding on employers and workmen.

It was reported in June that stoppages were by no means of rare occurrence and threats of stoppage were common. The following instances were quoted from a large number.[2] An important firm of explosives manufacturers stated that during the last five months the number of strikes and threatened strikes had averaged two a week. The men had struck on the ground that they were being hustled by their foremen, and had threatened to strike because a foreman examined some work under protest, and again because an attempt was made to improve time-keeping. The ironworkers were on strike on two vitally important vessels at Grangemouth Dockyard in spite of the instructions of their Society and of the recommendation of the Committee on Production. The Amalgamated Society of Engineers, in pursuance of a dispute with the Iron Founders' Association, had called on their members employed by Messrs. Brown, Duncan & Co. to strike, and had refused arbitration, though the

[1] See Part II., Chap. III.

[2] *Memorandum on the position leading up to the introduction of the Bill.* Hist. Rec./R/221.1/6.

Iron Founders' Association were willing to accept it. A dozen small strikes were reported by the Shipbuilding Employers' Federation as having occurred in the last two months.

In so far as strikes were occasioned by the refusal of demands for higher wages, the attitude of the workmen was admitted by those who knew the facts to be, in general, not unreasonable. The case was plainly stated by Mr. Hodge in the Second Reading debate.[1]

> "In the early days of the War, trade unionists declared that, so far as they were concerned, they would raise no new questions during its continuance. That declaration was made in the belief that other sections of the community would act as patriotically as they were anxious to do. But, unfortunately, the price of food rose by leaps and bounds, and the price of every necessity of life increased in the same way. . . . Notwithstanding the pressure that we endeavoured from time to time to place upon the Government to control prices, they almost did nothing in that direction. As a result of that, the standard of living for the workers was so much lowered that it became absolutely essential that they should ask for some increase in the wages to meet that additional cost of living. In most cases that assumed the phase of a war bonus, and as soon as the War terminated the men would be required to give it up. If it was generally agreed that the prices of the necessities of life should be limited, I am quite convinced the workers of this country during the further continuance of the War would not seek to exploit the nation's necessities as the holders of food and other commodities have done, but they would be contented to go on as they are."

On the strength of his experience as a member of the Committee on Production, Sir George Gibb wrote[2] at the beginning of June that experience had confirmed the views expressed in the Fourth Report of that Committee.[3] Labour unrest would continue and would increase so long as efforts were made to limit the natural increase of wages, due to shortage of labour supply and to the high cost of living, without concurrent efforts to deal with profits, either by limiting prices or by drastic taxation of war profits. The Trade Union leaders acknowledged the need for removing restrictions, but they wanted assurances, followed up by Government action, that the concession would not simply swell employers' profits. The taking over of armament firms, though the Government had announced the intention, had not been carried into effect. The Trade Union leaders and the workmen were watching and wondering as to the reasons of the delay.

Sir George Gibb added that workmen generally could not be charged with having taken advantage of the shortage of labour to

---

[1] *Parliamentary Debates* (1915), *H. of* C., LXXII., 1512.

[2] *Memorandum on the Labour Situation* (3/6/15), M.W. 9279.

[3] See above, Part II., Chap. III.

enforce by strikes, accompanied by refusals to submit to arbitration, excessive demands for higher wages. Except in a few districts and in a few classes of labour, mainly in shipyards, workmen, while maintaining for the moment established trade union customs, had worked exceedingly well, and had been content to accept, under agreement or arbitration, increases of wages based on figures considerably below the actual increase in the cost of living.

Mr. W. L. Hichens wrote[1]: "There has been a very rapid rise in wages since the beginning of the War, and there is every indication that it will continue. It is true that the Government have stated that there must be no stoppage of work over wages disputes and that such questions must be arbitrated upon. Usually, though not always, this procedure has been followed; but the arbitrators have been given no definite principles to work upon in making their award, with the result that their findings are often conflicting and unsatisfactory. Moreover, the employers are largely to blame; for, in their desire to get men, they have offered bonuses in individual cases, which naturally tend to become general. The men, on their part, would be more than human if they did not sometimes restrict output with a view to improving piece-work rates. And it would be unfair to blame them for trying to make the best terms for themselves that they can; and so long as they see certain men, or certain classes of men, getting bonuses, they naturally think they are entitled to look after themselves.

"In discussing wages questions, too, the point has sometimes been put to the employers that it is unreasonable on their part to refuse an increase, because, after all, it is the Government that pays, and, as Mr. Lloyd George said, the Government purse is bottomless. There is more truth, indeed, in their contention that the employer need not refuse an increase in wages than appears at first sight. Many Government contracts are now given out on a percentage basis—that is, the Government pay the actual cost of labour and material, plus a percentage for profit. Obviously, therefore, the higher the labour bill is, the greater will be the profit.

"All this has an important effect on output, for three reasons: (*a*) We find by experience that the existence of a dispute tends to make men less keen on their work. (*b*) The restriction of output, whether conscious or unconscious, to show that existing piece-rates are inadequate, tells its own tale. (*c*) With certain classes of men it is a fact that the more they earn, the less work they do. The instinct for saving being undeveloped, they naturally require leisure in which to spend all earnings above the subsistence margin."

Mr. Hichens observed that demarcation disputes were a frequent cause of strikes. Under the ordinary industrial system there was much to be said for the principle of demarcation; but in its results it was obviously wasteful. "That urgent work should be held up when suitable

[1] *Memorandum on the Influence of Drink on the Production of War Materials.* Hist. Rec./R/345/2. Mr. Hichens was Director of Messrs. Cammell, Laird & Co.

men are available, simply because they are not fully qualified members of a certain trade, is a disgrace in war time. And yet the demarcation disputes are as frequent to-day as in peace time, and strikes, owing to the attempt of some employer to turn on men outside the trade, are common occurrences. Here, again, the men are not really to blame. They think—and in the light of the history of industrial disputes the thought is not without justification—that the employer will use any relaxation of the present rigid system to break down the barrier between trade and trade. They think too that the employment of large numbers of outsiders will tend to build up a black-leg reserve, who will be employed as strike-breakers after the War. The Government has promised, in general terms, to safeguard their position after the War, but the undertaking is too vague to be convincing, and moreover there is no machinery for stopping demarcation disputes or enforcing an award. The effect of these disputes and restrictions on output is too obvious to need further explanation."

Mr. Hichens recommended (among other remedies) the appointment of a central committee, under the Minister of Munitions, representing both employers and workmen, with full powers to deal with all labour questions. There should be similar local committees, under the central committee, for local questions. No increases of wages, not justified by the rise in the cost of living, should be granted; and all increases should be settled by the central or local committees, who should also decide demarcation disputes.

On the other hand, the Government should impose limitation of profits, not merely on a few firms, but in the form of a heavy super-tax on all firms earning more than a certain rate of interest on their share capital. They should also limit prices, so as to keep down the cost of living.

Sir George Askwith's view of the situation and his proposals for remedy were communicated to the President of the Board of Trade in a Memorandum[1] dated 1 June. The following is a summary.

There were indications that some further action would shortly be needed to prevent the occurrence of labour disputes. It was doubtful if the rank and file of Trade Unions, or even some of their leaders, had accepted the spirit of the Treasury Agreement of 19 March. The Committee on Production had already given nearly 40 decisions on wages questions, covering directly some 750,000 work-people and involving very large additions to the wages bill. Such a process could not be again followed without serious difficulty, and it was necessary to consider carefully what course should be followed.

The present London Tramway strike indicated how many of the men viewed the position. It appeared to be, not a sudden outbreak, but a deliberate revolt, engineered by the leaders of one of the two Unions so as to look spontaneous. It was intended partly to force

[1] *Industrial Disputes : Power to investigate prior to stoppage of work.* Hist. Rec./R/180/33.

the London County Council to make concessions, partly to attract the men into one Union at the other's expense. The trouble in the cotton trade had come to such a pass that it was hard to see how widespread stoppage could be averted.

The position in the engineering trades was even more serious. In the last four months, every engineering district in the United Kingdom had agitated for, and received, by agreement or (in most cases) by arbitration, advances in wages reaching in the aggregate to a very large amount. A movement was now beginning (particularly on the Clyde, where the agitation had been most pronounced in February and where there had been a serious strike) for a further advance of wages; and if this movement gained headway, it would rapidly grow into another wave of demands for higher wages throughout the country. The local leader on the Clyde had not concealed his determination to exploit to the utmost the national needs, and, in view of his recent successes, his example might be followed elsewhere. The new claims would, of course, be resisted by the employers, and the result, sooner or later, would probably be strikes. Even if the arbitration procedure under the Treasury Agreement were followed for a time, the men, if their demands were disallowed, would be disposed to stop work.

Besides the more general movement, there were many cases (particularly on munitions work) where sudden stoppages took place, or were threatened; and in such cases the employers were giving way on the best terms they could obtain to avoid interference with output. The continued rise in food prices was likely to be used as a cover for exercising the power which, owing to labour shortage, was now in the hands of many Unions.

The writer thought that the more responsible Union leaders would welcome any remedy; and it was for consideration whether measures to prevent the occurrence of disputes should not be initiated. The possible steps were :—

(1) The total prohibition of strikes, and compulsory arbitration. This method, while it would entail a considerable organisation for arbitration and invite a flood of applications for settlement, could be largely simplified if it could be established that pre-war controversies (*e.g.* recognition of Unions), must not be raised.

(2) Some measure like the Canadian Act, which prevents strikes and lock-outs pending investigation by an independent authority, with recommendation of terms of settlement. This would obviate all sudden strikes.

(3) To make it a condition of employment that one month's notice must be given before work could be left, with penalties for breach. This would really be an extension of the Conspiracy and Protection of Property Act, 1875 (Clause 4), which protects gas and water undertakings from sudden strikes, and could be made applicable to irregular attendance.

The first method (with the provision against raising pre-war questions) would at this time be preferable ; but the other alternatives might be considered.

The Canadian Act[1] embraced three fundamental principles :—

(*a*) Restrictive measures prohibiting strikes and lock-outs, pending investigation ;

(*b*) Authoritative investigation, with public recommendation of terms of settlement ;

(*c*) The exercise, during such investigation, of conciliation with a view to settlement.

Under normal conditions, and particularly having regard to the special nature of our industrial organisation, the writer had recommended that the restrictive measures were unnecessary, but that the remaining principles should be adopted here. In a state of war, however, more was necessary, and, if the Government took this course, the restrictive measures should be included. The investigation authorised under the Act would include power to summon witnesses, administer oaths, and call for books, documents, etc., for confidential use. The latter power would enable enquiry to be made into profits, and so help to meet the workmen's suspicions that exorbitant profits were being made.

If the proposal could be made statutory under the Defence of the Realm Acts, it could be promulgated forthwith ; but if legislation were necessary, a short Bill on the lines of Clause 6 of the Draft of an Industrial Agreements and Inquiries Bill prepared early in 1914,[2]

---

[1] Sir George Askwith and Mr. Mitchell had been sent to Canada in the autumn of 1912 to study the Lemieux Act and its working. In their Report (*Parliamentary Paper* Cd. 6603) the opinion was expressed that an Act which embodied those portions of the Canadian Act which give power to conciliate in a dispute and, if necessary, to make recommendations for a settlement, but which omitted the restrictive and penal clauses, would be suitable and practicable in this country, and would be valuable alike to the country and to employers and employed. The proposals of the Report were taken up by Sir Stanley Buckmaster in January, 1914, and led to the drafting of an Industrial Agreements and Enquiries Bill (30 March, 1914), designed to enlarge the powers already possessed by the Board of Trade under the Conciliation Act, 1896. (Copy of this draft Bill in Hist. Rec./R/221/22.)

[2] This is the draft Bill referred to in the previous Note. Clause 6, which was based upon the Canadian Act, provided that—

> "Where a difference exists or is apprehended between an employer or any class of employers and workmen, or between different classes of workmen, the Board of Trade shall have power, in addition to the powers which they may exercise under section two of the Conciliation Act, 1896, to direct, if they think it expedient in the public interest, a formal inquiry under this Part of this Act into the causes and circumstances of the difference."

The persons holding the enquiry might be directed to act as conciliators under the Conciliation Act. They might summon witnesses and examine them on oath, and require the production of books and documents for confidential use. Failure to comply with any summons or requisition was to be subject to a fine.

Under these provisions the initiative lay with the Board of Trade, not (as in the Munitions of War Act) with the parties to the dispute. But, beyond this power of directing an enquiry, there was no interference with the ordinary course of trade disputes, and no provision for a binding award.

with such additions as were needed to incorporate the restrictive and penalising features of the Canadian Act, might be passed as an emergency measure.

The remaining alternative was to extend Clause 4 of the 1875 Act to all works and services engaged in supplying Government requirements, with the addition that an implied condition of employment on such work was that one month's notice must be given before work could be left. The aim would be to prevent sudden strikes and absences from work without good cause. Sir George Askwith concluded by again expressing his preference for the first method proposed.

On 1 June, Sir H. Llewellyn Smith wrote to the President of the Board of Trade, expressing his concurrence in Sir George Askwith's conclusion. He believed that nothing short of an absolute prohibition of strikes, coupled with compulsory arbitration, would meet the present needs, at all events in munitions industries. He also expressed the opinion that the time was ripe to prohibit restrictions on work and output in these industries, and that this should probably be done by amending the Defence of the Realm Act rather than the Conciliation Act. He believed that drastic legislation would be really welcomed by the Union leaders, though they would not dare to admit it. It was further recommended that the penalty to be imposed on persons guilty of resorting to a strike or lock-out, or of leaving work without a month's notice, should be imprisonment up to three or six months, fines being useless. The President, on 5 June, gave instructions for an " Amended Bill " to be drafted.[1] The Draft was to include the necessary provisions for limiting the profits of contractors.

In a *Preliminary Note on Labour Policy* (4 June)[2] Sir H. Llewellyn Smith sketched the outline for the Draft of the Bill, following as closely as possible the lines of the Treasury Agreement, but including the limitation of profits and provisions for a " King's Munition Corps."

It was proposed that the prohibition of stoppages of work and the enactment of compulsory arbitration, where other methods of settlement without stoppage failed, should be universal.

This proposal did not go beyond the intention of the Treasury Agreement, which laid down in the first place that during the War there should " in no case be any stoppage of work upon munitions and equipments of war or other work required for a satisfactory completion of the War." This absolutely ruled out stoppage on war work, but only on war work. The other two provisions covered all the trades represented at the Conference (a very wide field, including occupations only remotely connected with munitions production), and laid down that questions arising out of the War should be settled, without stoppage, by arbitration ; and that questions not arising out of the War should not be made the cause of stoppage during the War. The

[1] It was proposed at this time that the Bill should take the form of an Amended Defence of the Realm Bill.

[2] HIST. REC./R/221.1/17.

phrasing was not meant to be legally exact ; and it is clear that the intention was that there should be no stoppage of work in any trade whatever that could be brought to adhere to the Agreement.

The proposal to make the prohibition universal merely removed the question from the region of voluntary agreement into the region of compulsion. It was, however, modified in the first Draft of the Bill (12 June). Clauses 1 and 2, which prohibited strikes and lock-outs, subject to notice being given by the Minister of Munitions, were confined to work " on or in connection with the supply of munitions of war." On the other hand, Clause 4 of this Draft, which enacts the compulsory reference of disputes to arbitration, was not so limited, but extended to all employment, subject only to the provision that notice should have been given, prohibiting a lock-out or strike, or the continuance of a lock-out or strike, in connection with any such difference. The scope of these clauses was the subject of much subsequent discussion, and was substantially modified.

This first Draft did not leave to agreement between the parties the choice between three alternative methods of arbitration, as laid down in the Treasury Agreement. Differences were, on the application of either party, to be referred to an arbitration tribunal appointed by the Board of Trade, whose award was to be binding under penalty of a fine.

One of the three alternatives in the Treasury Agreement was a court of arbitration on which employers and labour were to be equally represented. The following general criticism of bodies so constituted was put forward in a memorandum by Mr. I. H. Mitchell, of the Chief Industrial Commissioner's department, and deserves to be quoted :—" The policy during the past few months has been to leave the solution of many of the labour difficulties in the hands of Committees largely composed of employers and Trade Union officials. Frankly, I do not think the best results will follow. It would be as reasonable to expect good temperance results from a licensing authority composed of publicans and total abstainers. Trade Union officials are pro-Labour ; they are elected because they are more pro-Labour than any of their shopmates ; they cannot go further in the direction of giving judicial decisions than those who elect them will allow ; in most cases they cannot go so far, as, in their anxiety to retain the confidence of those they represent and keep off ambitious rivals, they must show by their actions that they are the best champions the men can possibly have. They are, therefore, in an extremely difficult position, when called upon to judge fairly upon questions affecting Labour ; and, with a few honourable exceptions, they seldom try to be anything but candidly pro-Labour, irrespective of the merits. The employers also are not free from bias ; so that to expect a fair and just solution from such bodies is likely to lead to grievous disappointment. A much better way is for the Government to departmentally collect the facts and then to act accordingly."

The three alternative courts of arbitration were, however, subsequently embodied in the Bill (Schedule 1). This was agreed to

by the Minister at a conference with Trade Union delegates, which was called to discuss a synopsis of the Bill on 16 June.[1] At this meeting the general sense appeared to favour the prevention of all strikes and lock-outs universally. It was, however, pointed out that employers might take advantage of the prohibition of strikes to refuse to consider petitions from the men, and that power should be taken to make bodies of employers come together for that purpose.

SECTION 3. DIFFERENCES TO WHICH PART I. APPLIES.

In studying the provisions of this First Part of the Bill, as introduced and modified during its passage through the House of Commons, it will be convenient to begin with Section 3, which defines the differences to which Part I. applies.

These differences are divided into two classes :—

(*a*) Differences arising in employment " on the manufacture or repair of arms, ammunition, ships, vehicles, aircraft, or any other articles required for use in war, or of the metals, machines or tools required for that manufacture or repair (in this Act referred to as munitions work) "[2] ;

(*b*) Differences arising in employment " on any other work of any description, if this Part of the Act is applied to such a difference by His Majesty by Proclamation on the ground that in the opinion of His Majesty the existence or continuance of the difference is directly or indirectly prejudicial to the manufacture, transport, or supply of Munitions of War."

Further, this Part of the Act may be so applied to such a difference at any time, whether or not a strike or lock-out has occurred.

It will be observed that under (*b*) the method of Proclamation is substituted for notice given by the Minister prohibiting a strike or lock-out, as the condition which would bring differences in other than munitions work within the scope of this Part. With reference to this provision, Sir John Simon pointed out that this was not a Bill for compulsory arbitration over the whole field of labour.

> " The Bill is so drawn that, if it is to be extended at all in case of need by Proclamation, the extension is not to be to a new trade or to a new field of labour ; the extension is to be to the specific difference or dispute which calls for such intervention. . . . It is not our intention, automatically, to bring in large additional classes of labour merely because in a given case we have to use the machinery of the Bill."[3]

The miners and the cotton operatives could not be induced to assent to compulsory arbitration being applied to their industries.[4]

---

[1] HIST. REC./R/300. See below, p. 36.

[2] This definition of munitions work is less comprehensive than that contained in the Ministry of Munitions Act. The words " aircraft " and " metals " were added in Committee. (*Parliamentary Debates* (1915), *H. of C.*, LXXII., 1980, 1982.)

[3] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 1541, 1543.

[4] *Ibid.*, 1199.

The Minister held three conferences with the Executive of the Miners' Federation of Great Britain on 24, 25, and 28 June, with the object of securing means, if not by the Bill, then by agreement, of preventing the disturbance of industry. Mr. Lloyd George had informed the miners' delegates at the outset that, while the Government much desired that the miners should come under the Bill, he would bring no pressure to bear upon them and would accept their refusal. Mr. Smillie pledged the Miners' Executive, of which he was President, to do everything possible to maintain the output of coal; but stated that the Executive, after full discussion, had been unanimous against coming under the Bill. The miners were accustomed to settle small disputes with the colliery manager; but if a dispute had to go before a court, "the whole colliery would be out, because they resent very much any outside interference."

At the conference on 28 June, the Executive proposed, if the South Wales dispute were settled shortly, to give the following guarantee :—

> "That, in order to prevent strikes by miners during the War, we are prepared to enter into an arrangement with the coalowners in every district, by which all disputes can be settled by the representatives of the owners and the workmen, and in the case of the two sides failing to settle any dispute, an independent chairman be called in with full powers to settle."

The Minister pressed for the inclusion of these terms in a special clause of the Bill without any provision for penalties. The Executive resisted this suggestion on the ground that the miners, if they were brought under the Bill, would refuse to join in the movement which was being promoted by the Executive for increasing output. The conclusion reached was that the miners were to be excluded from the Bill, but the Executive agreed to give a guarantee to set up machinery on the lines of the resolution above quoted.

Mr. Henderson and the President of the Board of Trade met the cotton operatives,[1] who also contended that their industry was so well organised that any method of preventing stoppage which their Union advocated would be effective. They passed a resolution substantially to the same effect as that of the miners.

At the Committee stage, on the motion of Mr. Lloyd George,[2] the following paragraph, which had been accepted by the Labour leaders, was inserted in Section 3 :—

> "Provided that if in the case of any industry the Minister of Munitions is satisfied that effective means exist to secure the settlement without stoppage of any difference arising on work other than on munitions work, no proclamation shall be made under this section with respect to any such difference."

A further addition was made to the Section, embodying a principle which had been agreed upon between the Minister and the Trade

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 1576.
[2] *Ibid.*, 1989.

Union leaders. Mr. Hodge[1] in moving the insertion of the clause, explained that the object was to provide for cases where civil or commercial work was being carried on side by side with munitions work in a controlled establishment. The employer might claim that Trade Union rules should be relaxed for the commercial work in the same way as for the munitions work. The amendment was to secure that such changes should not take place till an agreement had been reached. It ran as follows :—

> "When this Part of this Act is applied to any difference concerning work other than munitions work, the conditions of labour and the remuneration thereof prevailing before the difference arose shall be continued until the said difference is settled in accordance with the provisions of this Part of this Act."

SECTION 1. SETTLEMENT OF DIFFERENCES.

The classes of differences to which the Act applies having been thus defined in Section 3, Section 1 provides the machinery for the settlement of disputes arising within those limits. It enacts :—

(1) That any difference to which the Act applies, whether existing or apprehended, may, if not settled by the parties or under existing agreements, be reported to the Board of Trade by either party[2] ;

(2) That the Board shall consider the difference and take any steps that may seem expedient to promote a settlement, and may, if they think fit, refer the matter for settlement either in accordance with the provisions of the First Schedule (which enumerates the three arbitration tribunals provided for by the Treasury Agreement), or to any suitable existing machinery for arrangement ;

(3) That where undue delay occurs in settling a matter referred by the Board under (2) to existing machinery, the Board may annul the reference and substitute a reference to a court of arbitration under Schedule 1[3] ;

(4) That the award shall be binding on both parties, and may be retrospective. Contravention or non-compliance is an offence under the Act.

Section 14, which deals with penalties, provides for this offence a fine not exceeding £5 for each day or part of a day during which the offence continues, and, if the offender is an employer, for each man in respect of whom it takes place.

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 1996.

[2] In this clause "may be reported" was substituted for "shall be reported" in the original draft. The clause became permissive.

[3] This sub-section was added in Committee (*Parliamentary Debates* (1915), *H. of C.*, LXXII., 1958).

Section 2. Prohibition of Strikes and Lock-outs.

Section 2 contains the prohibition of strikes and lock-outs. A strike or lock-out on munitions work or occasioned by a difference which has been proclaimed, is legal under the Act only if it satisfies the condition that the difference shall have been reported to the Board of Trade and the Board shall not have referred it within twenty-one days[1] for settlement.

The penalties for contravention are laid down by Section 14. For lock-outs the penalty is a fine not exceeding £5 in respect of each man locked out, for each day or part of a day during which the offence continues; for strikes, a fine not exceeding £5 for each day or part of a day.

The terms "lock-out" and "strike" are defined by Section 19.

The Act contains no prohibition of incitement to strikes or lock-outs.[2]

III. Section 4. The Controlled Establishment.

It has been seen that Part I. of the Act was based on those paragraphs of the Treasury Agreement which provided against stoppage of work. The main purpose of Part II. is to give legal sanction to the remainder of the Agreement and to ratify the bargain that Trade Union restrictions which tended to limit output should be suspended, provided that employers' profits were limited and that the restoration of conditions after the War should be guaranteed.

Section 4 enacts that, "if the Minister considers it expedient for the purpose of the successful prosecution of the War that any establishment in which munitions work is carried on should be subject to the special provisions as to limitation of employers' profits and control of persons employed and other matters contained in this section, he may make an order declaring that establishment to be a controlled establishment." Any part of an establishment in which munitions work is not carried on may be treated as a separate establishment.

---

[1] "Twenty-one days" was substituted for "a month" in Committee (*Parliamentary Debates* (1915), *H. of C.*, LXXII., 1973).

[2] A prohibition of incitement had been included in the synopsis of the Bill discussed with the Trade Unions on 16 June. A motion to omit the words was defeated by 37 votes to 21; but as this was the only point on which a serious cleavage of opinion was evident, the Government decided to drop it out of the Bill. A provision against incitement was afterwards inserted in D.O.R. Regulation 42: "If any person attempts . . . . *to impede, delay, or restrict the production, repair, or transport of war material, or any other work necessary for th successful prosecution of the war,* he shall be guilty, etc."

Upon such order being made, several provisions are to apply to the establishment[1]:—

(1) The profits are to be limited in accordance with the provisions of Section 5.

(2) Rates of wages, salaries, etc., are not to be changed without authorisation.

(3) Rules, practices, and customs tending to restrict output or employment are to be suspended, with penalties for incitement and a provision for arbitration in cases of dispute whether a rule, practice, or custom is restrictive or not.

(4) The employer is to be bound by the guarantee of restoration, the clauses of which are set out in Schedule II.

(5) The employers and persons employed are to comply with regulations made for certain purposes by the Minister, with penalties for non-compliance.

(6) The owner is empowered to comply with the provisions of the Section, notwithstanding other obligations, and required, subject to penalty, to comply with any reasonable requirements of the Minister as to information or otherwise for the purposes of this Section.

Certain points in connection with these provisions call for remark.

(1) The limitation of profits will be considered below, in connection with Section 5.

(2) This sub-section prohibits unauthorised changes in the rates of wages, salaries, or other emoluments "of any class of person employed in the establishment, or of any persons engaged in the management or the direction of the establishment." The intention was that the excess profits payable to the Exchequer should not be diminished by any undue increases of these emoluments. A further safeguard was afterwards added by Rule 9 (*f*) of the Munitions (Limitation of Profits) Rules, 1915, which provides against increases being made after the end of the standard period and before the beginning of the control period, in anticipation of the declaration of control.

At the Committee stage the following qualification was added[2]:—

"(other than changes for giving effect to any Government conditions as to fair wages or to any agreement between the owner of the establishment and the workmen which was made before the twenty-third day of June, nineteen hundred and fifteen)."

---

[1] It will be noted that, as all these provisions come into force together and only from the date of control, the limitation of profits is not retrospective, and profits made before that date cannot be touched. This fact seems not to have been understood when the Bill was before the House of Commons, even by some members of the Government. Mr. Henderson said in the Second Reading debate: "Members . . . will find that under these clauses very considerable amounts of the profits that have been made are already assured to the Treasury." (*Parliamentary Debates* (1915), *H. of C.*, LXXII., 1578).

[2] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 2031.

A clause was also added,[1] making it an offence for the owner or any contractor or sub-contractor employing labour in the establishment to make such changes without submitting his proposal or when consent had been withheld. The penalty under Section 14 (*e*) is a fine not exceeding £50.

(3) The sub-section dealing with the suspension of "any rule, practice, or custom not having the force of law which tends to restrict production or employment," did not undergo any important amendment.

(4) The provision for the employer's undertaking to carry out the provisions of Schedule II., was amended in Committee[2] by the addition of words making it an offence under the Act to break, or attempt to break, such an undertaking. The penalty is a fine not exceeding £50 [Section 14 (*e*)].

This addition is to be read in connection with Section 20 (2) where it is provided that the Act "shall have effect only so long as the office of Minister of Munitions and the Ministry exist,"[3] but that "Part I. of this Act shall continue to apply for a period of twelve months after the conclusion of the present War to any difference arising in relation to the performance by the owner of any establishment of his undertaking to carry out the provisions set out in the Second Schedule to this Act, notwithstanding that the office of Minister of Munitions and the Ministry of Munitions have ceased to exist." This clause also was added in Committee.

Both these additions were made because it had been pointed out that the Bill in its original form provided no legal sanction for the employer's undertaking and no machinery for enforcing its fulfilment. Section 20, however, provides only for the continuance of the system of settling differences established by Part I.; it does not provide for the perpetuation of Munitions Tribunals—the only courts before which a fine is recoverable under this Act (Section 14 (2)). The Act accordingly appears to make no provision for the punishment of an employer for the offence under Section 4 (4) at any time after the Ministry shall have ceased to exist. Nor was it made clear how the penalties for offences under Part I. were to be inflicted during the year after the conclusion of the War, if the Ministry should in the meantime have ceased to exist.[4]

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 2033. [2] *Ibid.*, 2040.

[3] Clause 6 of the Ministry of Munitions Act, 1915, enacts that "the office of Minister of Munitions and the Ministry of Munitions shall cease to exist on the termination of a period of twelve months after the conclusion of the present War or such earlier date as may be fixed by His Majesty in Council."

[4] The Amending Act, 1916, repealed the words "Part I. of" in Section 20 (2), thus providing that the other relevant clauses of the Act should continue, for a year after the end of the war, to apply to this class of differences.

The Minister, in introducing the Bill, once more pledged the Government to see that the undertaking was carried out :—

> " The second thing is the removal of all regulations and practices—or rather, I would not say removal, but suspension —during the War, on the honour and pledge of the nation that things would be restored exactly to the position they were in before."[1]

Mr. Pringle prophesied that, after the War, the masters, who would have realised an increase of output by the suspension of restrictive rules, would argue that a reversion to the old system would be economically bad for the country. The conclusion of the War would bring a reversal of the conditions that now prevailed between Capital and Labour. The demand for labour would be small ; the supply would be large. Prejudiced by this change, the Trade Unions would not be in a strong position to resist the plausible representations of employers that a restoration of hampering rules and customs would injure trade, and that workmen would be foolish to exact a fulfilment of the pledge.

The clauses of the employers' undertaking, as set out in Schedule II., are substantially identical with the form of guarantee embodied in the Treasury Agreement.[2]

At the Minister's meeting with Trade Union delegates on 16 June,[3] to discuss the provisions of the Bill, it was pointed out that firms which did not come under the Act as controlled establishments, but continued to do commercial work, might take advantage of the withdrawal of their skilled men to introduce less skilled labour. In such cases there would be no guarantee that the *status quo* would be restored after the War. The Minister was asked whether the Government would put pressure on these firms to restore pre-war conditions. Mr. Lloyd George replied, in the first place, that, since the statutory obligation to suspend restrictions was confined to controlled establishments, the statutory obligation to restore them must be similarly limited. If, however, a dispute arose in the case of an uncontrolled establishment, the arbitrator might make any conditions he chose with regard to the settlement. " He can say : Owing to the special conditions of the War, you must allow these regulations to be suspended for the time being ; but it is on the express condition that you return to the *status quo ante* after the War."

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 1199.

[2] See above, Part II., Chap. IV. The only important change is in paragraph (4), which provides that where semi-skilled men replace more highly skilled workers, " the *time and piece* rates paid shall be the usual rates of the district for that class of work." The words " *time and piece* " were inserted in Committee. The National Advisory Committee had been informed that some Birmingham employers had insisted that the corresponding paragraph in the Treasury Agreement should not apply to time rates ; whereas the original intention had been that this paragraph should safeguard the time rates, and paragraph (5) the piece rates. In making this intention clear, the amendment incidentally introduced an anomalous expression, since, except in shipbuilding, there are no district piece rates. Paragraph 9 of Schedule II. contains a drafting error : " the fourth paragraph " should be " the third paragraph." The correction was made by Section 19 of the Munitions of War (Amending) Act, 1916.

[3] HIST. REC./R/300/5.

(5) This sub-section contemplates the making of regulations "with respect to the general ordering of the work in the establishment with a view to attaining and maintaining a proper standard of efficiency and with respect to the due observance of the rules of the establishment."

Contravention or non-compliance is an offence, punishable under Section 14 (*d*) by a fine not exceeding £3.

The object was explained to be "to establish discipline in the workshops," and in particular to enforce better time-keeping. The original draft of the Bill had provided for the establishment of a "King's Munition Corps" and it had been proposed that discipline should be enforced in the controlled establishment by a "Munitions Officer" or commandant, armed with quasi-military authority. As will be seen later, the negotiations with the Trade Unions before the Bill was introduced resulted in the substitution of a scheme for enrolling Munitions Volunteers, and the consequent disappearance of all features of a military character connected with this body. Sub-section (5) was correspondingly altered, and the Munitions Tribunal of the second class (under Section 15) became the authority to enforce compliance with the regulations.

(6) This sub-section relieves the owners of a controlled establishment from obligations "in any Act, Order, or deed under which they are governed," which might prevent compliance with the provisions of the Section, and requires them to produce information reasonably demanded by the Minister. The refusal of information is an offence, and the giving of false information is punishable under Section 12.

This sub-section underwent no amendment.

In Committee the question was raised, what classes of firms it was intended should be controlled. Sir John Simon replied that he could not say more than that "every patriotic firm which seeks to do useful work, and would like to be controlled, has only to apply to the Minister of Munitions." He would not say that every firm making munitions would be controlled, "but inasmuch as it is highly desirable that we should get the Ministry of Munitions in close connection with the work of making munitions, it will be obvious that this is not intended to apply merely to cases here or there, but an attempt to make munitions, partly by controlling labour and partly by controlling profits, within such limits as will enable munitions to be produced as rapidly as possible. I do not think I can give an answer more specific than that."[1]

IV. Section 5. The Limitation of Profits.

When the Bill was being prepared, some objections were raised to confining the limitation of profits to controlled establishments. The Director of Naval Contracts, in a Note forwarded to Sir H. Llewellyn Smith on 5 June, had pointed out that, if armament and

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 2020.

shipbuilding firms alone were taxed, invidious questions would arise. These firms had made special efforts, while collieries, millers, metal manufacturers, and others had made money with no effort. Further, armament firms might expect to suffer after the War, and, in any case, a too severe limitation would discourage much zeal that was being shown.

On similar grounds, Mr. Terrell, at the Committee stage, moved to omit all the provisions for limitation of profits. He said :—" There are a great many other classes of individuals in the country who . . . most of us have pretty good reason to suspect are making great profits out of the War, and I do not for the life of me see why they should be let off and only these particular establishments, which are doing a special service to the State, be singled out."[1]

It was, of course, impossible to introduce into the Bill provisions for a universal tax on war profits ; but, in pointing this out, Sir John Simon observed that the case for such a tax was in no way prejudiced by this partial application of the principle.[2]

It has already been remarked that the real cause of the restriction lay in the circumstances which had led to the bargain with the Unions at the Treasury Conference. That the provisions of Sections 4 and 5 constitute, even in a legal sense, a bargain, was the view taken by the Speaker and the Chairman of Committee in the House of Commons. At the Committee stage, Mr. J. M. Henderson asked for a ruling on the question whether these clauses were not taxing clauses, and could, therefore, not be entertained except under a Resolution in Ways and Means. The Chairman, after consultation with the Speaker, ruled that this was not the case. He said :—

> " I think it may be described in this way : that these two clauses contain an arrangement by which certain persons who receive certain benefits in the way of relaxation of customs and rules will, at the same time, surrender certain financial advantages which would otherwise accrue to them ; therefore it is in the nature of a contract, in other words, a *quid pro quo*.
>
> " Secondly, I think it may be looked at in this way : that the State proposes to give to certain establishments orders for war materials, and the limitation of the profit to be obtained by means of these orders is what, in Committee of Supply, we call an Appropriation-in-Aid—that is to say, that any amount beyond a certain produce shall come back to His Majesty's Government. That, I think, is the correct way of looking at the procedure of this Clause."[3]

Later experience has justified the critics who urged that the taxation of excess profits should have been handled first on general principles, before Labour was asked to make serious sacrifices whose immediate effect would be to increase profits. The following words are quoted from a memorandum written in April, 1917 :—

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 2007.
[2] *Ibid.*, 2015.
[3] *Ibid.*, 2005.

"There is no doubt that of all the factors that have been contributing to the difficulty in handling the labour problems in this country, the most formidable has been what has been called 'profiteering by contractors.' Experience entitles it to be said; and it is likely that, if from the outset of the War there had been automatic provision preventing individuals from profiting by the War, labour difficulties, both sentimental and actual, might have been in part, if not wholly, avoided. It must have followed that, if the workmen had realised that the employer had forgone all material advantage, he on his side might be asked to forgo certain of his rights. The ultimate limitation of profits and the heavy Excess Profits Duty, while to a certain extent efficacious, never entirely removed the first and abiding sting of the sight of huge profits being compiled. Of all the conclusions that one is entitled to draw, none emerges with greater certainty than this: that compulsion in dealing with private profits is the fundamental method of grappling with all labour difficulties from the outset."[1]

Under Section 4 (1) "any excess of the net profits of the controlled establishment over the amount divisible under this Act . . . . shall be paid into the Exchequer." Section 5 defines the divisible profits as "an amount exceeding by one-fifth the standard amount of profits," and contains the supplementary provisions for the ascertainment of the standard amount. The basis of these provisions was that which had been laid down in the negotiations with Messrs. Armstrong and Messrs. Vickers in March.[2]

This Section underwent several important changes.

(1) The main principle that "the amount of profits divisible under the Act shall be taken to be an amount exceeding by one-fifth the standard amount of profits" remained unchanged.

An amendment was moved by Mr. Terrell[3] to the effect that the profits should be ascertained by the Commissioners of the Inland Revenue, on the ground that the Commissioners already possessed the necessary evidence, which, being private, could not be communicated to the Committee which Sir John Simon had stated would be appointed.[4]

It was objected, however, that, as the Treasury had an interest in the profits, it would not be right for the Commissioners to assess them, and the amendment was withdrawn.

(2) The definition of the standard amount of profits in Sub-section (2) was modified. In the Bill as introduced it read:—

"The standard amount of profits for any period shall be taken to be the average of the amount of the net profits for the

---

[1] *Notes on Labour Problems in War Time*, by Mr. U. Wolff, HIST. REC./H/300/2.

[2] See above, Part II., Chap. III., Section VII.

[3] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 2046.

[4] The reference is to the Committee under the chairmanship of Sir H. Babington Smith, referred to below.

two *corresponding periods* completed next before the outbreak of the War."

In Committee, on Mr. Lloyd George's motion, the words "*financial years of the establishment*" were substituted for "corresponding periods"; and the words "*or a proportionate part thereof*" were added at the end.[1]

(3) This Sub-section provides for certain cases in which it may appear or be represented to the Minister that the standard as above defined is in some way not fairly applicable to a particular establishment. Three types of cases are given :—

(*a*) It may appear or be represented "that the net profits *or losses* of all or any other establishments belonging to the same owner should be brought into account." The words "*or losses*" were added in Committee.[2]

(*b*) It may appear or be represented "that the average under this section affords or may afford an unfair standard of comparison."

(*c*) It may appear or be represented "that the average under this section . . . affords no standard of comparison." It was pointed out by Mr. Duke[3] in Committee that in the case of a new business there would be no standard of comparison, and these words were added at the Report stage.[4]

It is provided that in these cases "the Minister may, if he thinks just, allow those net profits or losses to be brought into account, or substitute for the average such an amount as the standard amount of profits as may be agreed upon with the owner of the establishment."

The Minister "may, if he thinks fit, *and shall, if the owner of the establishment so requires*, refer the matter to be determined by a referee or board of referees appointed or designated by him for the purpose, and the decision of the referee or board shall be conclusive for all purposes." The words in italics were added in Committee.[5]

(4) This Sub-section provides that the Minister "may make rules for carrying the provisions of this section into effect."

In Committee[6] Mr. Lloyd George moved to add the following words :—

"and these rules shall provide for due consideration being given in carrying out the provisions of this section as respects any establishment to any special circumstances such as increase of output, provision of new machinery or plant, alteration of capital or other matters which require special consideration in relation to the particular establishment."

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 2059.
[2] *Ibid.*, 2120. [3] *Ibid.*, 2066. [4] *Ibid.*, 2120.
[5] *Ibid.*, 2064. [6] *Ibid.*, 2064.

This important addition became the basis for Rule 10 of the Munitions of War (Limitation of Profits) Rules, made under this Sub-section on 15 September, 1915. Rule 10 provides for allowances, in addition to the standard amount of profits, to be made in respect either of increased capital or of increased output.

The purpose of this addition was explained by Sir John Simon in Committee.[1] He gave two illustrations to show that a too rigid application of the main principle upon which the divisible profits of a controlled establishment were to be ascertained, might have the effect of discouraging efforts to increase output.

(*a*) Suppose two businesses, each of which before the War had an output represented by a turnover of £100,000 a year, and earned a profit of 10% on that turnover (£10,000). If one of these factories were controlled and threw itself into munitions production to the extent of doubling its shifts and incurring expenditure which might not be permanently remunerative, and thereby doubled its output and increased its turnover to £200,000, its divisible profits under the principal rule, being fixed with reference only to its past performances, would be £10,000 plus one-fifth, *i.e.* £12,000. Supposing that the other business remained uncontrolled and only increased its efforts to the extent of raising its turnover to £120,000, a profit of 10% would yield as much as would be allowed to the controlled factory. It was evident that some adjustment was needed to avoid penalising the establishment which made the greater effort.

(*b*) The second case was the business which had made no profit, or only a very small profit, before the War. If that became a controlled establishment and its capital began to make a large return, it would not be fair to allow no profit.

Sir John Simon announced that such matters would be referred to a small, impartial Committee of Referees under the chairmanship of Sir Henry Babington Smith.

V. Provisions for the Supply and Movement of Labour.

Three important Sections (6, 7, and 10) of the Act may be considered together, being all concerned with control over the supply and movement of labour. They represent all that was left standing of a much larger scheme, and lie nearer to the central purpose of the measure than other more prominent features. The Act is to be understood as having been designed to go as far in the direction of industrial compulsion as the Trade Unions and their members could be persuaded to move. The history of these parts of it can best be approached by starting from the ideal extreme of compulsory service. It will be seen how, as the preliminary negotiations went forward, one after another of the more unpopular features of this ideal were abandoned, until the Bill finally came before the House as a measure agreed with the Trade Union leaders.

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 2015.

In some circles, compulsory military service was at this time put forward as a short and sufficient remedy for all the labour difficulties that hindered the production of war material. Under a Military Service Act the Government would have been armed with powers, at least in theory, to allocate man-power to the Army and to the factories, to distribute labour among the various classes of work, and to enforce discipline by military methods; though conscription by itself would not have provided an administrative organisation capable of handling the whole problem on a comprehensive plan.

The Liberal Government which held office until the end of May was known to be averse from compulsory military service. On 20 April, Mr. Lloyd George, in reply to a question in the House, said: "The Government are not of opinion that there is any ground for thinking that the War would be more successfully prosecuted by means of conscription"; and added that the Secretary of State for War was "very gratified with the response which has been made to the appeal to the country for voluntary enlistment."[1] The advocates of conscription at this time could not, in fact, point to any deficiency of numbers. It was notorious that tens of thousands of men had been recruited, whom it was impossible to equip even with Service rifles and bayonets. The complaint was rather that the young unmarried men were not coming forward. But it was believed, not without reason, by the Labour world that conscription was really desired, not to secure any "equality of sacrifice," but as a means to industrial compulsion.

This motive was indeed avowed by some supporters of the proposal. Sir F. Banbury, criticising the Amending Bill for the control of the liquor trade, said on 10 May:—"Supposing that the Government were to bring in conscription, it would be perfectly open to them to say, if a man were losing time: 'You will have to join the Forces.' . . . I would also remind the Chancellor of the Exchequer of what the French Government did in the railway struggle some years ago. Having conscription, they embodied the men and ordered them to do certain work."[2] Sir F. Banbury, at a later stage, moved for a new Clause in the same Bill embodying his suggestion:—

> "It shall be lawful to enlist men compulsorily for any work that may be required for the defence of the Realm and to bring such men under military discipline."[3]

Shortly before the reconstruction of the Cabinet, the milder suggestion of a National Service Register came to the front. This was recommended, for instance, on 19 May, by General Sir Ivor Herbert, who explained that he had "generally been in opposition to those who represent the views of what we call the National Service League." He considered that the object of such a Register would be "to bring home to every man and into every home that there is work of some

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXI., 173.
[2] *Ibid.*, 1387. [3] *Ibid.*, 1575.

sort for every man to do, whether it is military service or whether it is not."[1]

With the formation of the Coalition Government, it was commonly supposed that the partisans of conscription had received an accession of strength. This impression appeared to be strikingly confirmed by the speech delivered by Mr. Lloyd George at Manchester on 3 June, the day on which the Ministry of Munitions Bill was introduced. After referring to the French system of organisation, Mr. Lloyd George dwelt on the need for equality of sacrifice. It was not fair that one employer should give all his machinery, another do nothing to help. The Defence of the Realm Act provided a means for jogging the laggards. He then touched upon the question of compulsion for labour.

" To introduce compulsion as an important element in organising the nation's resources of skilled industry and trade does not necessarily mean conscription in the ordinary sense of the term. Conscription means raising by compulsory methods armies to fight Britain's battles abroad. . . . If the necessity arose, I am certain no man of any party would protest. But pray do not talk about it as if it were anti-democratic. We won and saved our liberties in this land on more than one occasion by compulsory service." France and America had done the same. But it would be a mistake to resort to it unless it were absolutely necessary. He would, however, say to those who wished to dismiss conscription : " You are not getting rid at all of the necessity for the aid which compulsion would be in mobilising the industry and strength of this country." Compulsory powers had already been taken to mobilise employers' workshops and machinery, to save time that would otherwise be lost in persuasion.

For labour two things were essential : to increase the mobility of labour, and to secure greater subordination to the direction and control of the State. In France, owing to National Service laws, all labour was at the disposal of the State. Labour could be moved where it was wanted. Our voluntary army had taken ten months to enlist : we could not afford another ten months to enlist an industrial army. Men who were wanted at home had enlisted. We needed compulsion to prevent this. In the Army there were no Trade Union restrictions.

He added later that workmen on Government work should be protected by a badge or uniform, and that release from the Colours would be much easier if we had conscription as it existed in France.

This speech gave rise to a question in the House on 7 June[2] : " Whether the statements made by the Minister of Munitions at Manchester indicate that it is the intention of the Government to introduce a system of compulsory military service or of compulsory labour." The Prime Minister replied that the response to the latest appeal for recruits had been satisfactory, and that an announcement of the Government's policy would be made shortly.

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXI., 2397.
[2] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 81.

Two days later, in the House of Lords debate on the Ministry of Munitions Bill,[1] most of the unofficial speakers argued in favour of compulsion, whether military or industrial or both. Lord Joicey supported conscription. Lord St. Davids, who warmly defended workmen in general against the current charges of idleness, forecasted that it would nevertheless be necessary to "requisition labour by force." Earl Stanhope said: "It does appear to us that men who refuse to work should be made to fight. The man who refuses to do his duty in the workshop should be sent to the Front." Lord Stalbridge considered that the Minister of Munitions would have a very difficult task in organising the men in the workshops "unless he can have them under some discipline and say that they have to work so many hours a day." Lord Curzon, who was in charge of the Bill, recognised certain echoes of earlier speeches of his own, but declined to follow their Lordships on to this ground.

It is interesting to note that none of the speakers showed any consciousness of one principal ground of the workman's objection to conscription for industrial purposes. This was that the employers were still free to make unlimited profits, and it was well known that in some quarters these profits were enormous. Mr. Wilkie put the point clearly in the debate on the Second Reading in the House of Commons:—

> "Our difficulty with our workmen is this: 'I am quite willing to do the behest of the Government, volunteering for war work or anything else, going to the front and sacrificing my life; but I am not going to do it to allow a fellow-citizen to make a profit out of my sacrifice.'"[2]

The most that the Government was even pledged to do was to limit the profits of the "most important" engineering and ship-building firms, which in practice meant some forty firms on the War Office and Admiralty lists; and, when the above-mentioned speeches were delivered, even this had not been done. Labour regarded the whole propaganda with inveterate suspicion, as aiming at striking every weapon out of the workman's hands, while no actual measures had yet been taken to control profits and prices.[3] The atmosphere so created was not favourable to the success of the Munitions of War Bill which, on the one hand, made no provision for limiting every sort of excessive war profits, and, on the other, restricted the only means by which workpeople can at any time protect their standard of living.

---

[1] *Parliamentary Debates* (1915), *H. of L.*, XIX., 25 ff.

[2] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 1586.

[3] At the Minister's conference with Trade Union Delegates on 16 June, one speaker said: "Can we have any declaration from the Government or from you of the policy in regard to conscription? Or will it be possible for you to take some advantage of the Trade Unions having given up this power (of striking) which they have threatened several times to use against conscription and to introduce conscription, knowing that we had given away this weapon?" In reply Mr. Lloyd George said that he could see no necessity for military conscription so long as tens of thousands of recruits were still unarmed. "As far as I can see, there is no immediate danger of conscription, and I shall be very surprised if we do not get through without it." (HIST. REC./R/300/5, p. 34).

VI. Section 6. War Munition Volunteers.

Section 6 provides that—

> " (1) If any workman, in accordance with arrangements made by the Minister of Munitions with or on behalf of trade unions, enters into an undertaking with the Minister of Munitions that he will work at any controlled establishment to which he may be assigned by the Minister, and be subject to the penalty imposed by this Act if he acts in contravention of or fails to comply with the undertaking, that workman shall, if he acts in contravention of or fails to comply with his undertaking, be guilty of an offence under this Act."

The offence is punishable, under Section 14, with a fine not exceeding £3, recoverable before a Munitions Tribunal of the second class, as instituted by Section 15.

Sub-section (2) makes it an offence for an employer to dissuade a workman from entering into such an undertaking or seek to retain him in his own employment.

This purely voluntary scheme was the outcome of negotiations carried on with the Trade Unions in the first three weeks of June. In order to appreciate how widely it differed from what was projected at the outset, it is only necessary to compare it with the first sketch of the Bill drawn up at the Board of Trade on 1 June.[1] The proposal to establish some sort of military organisation and discipline for workmen is there put forward in two forms.

(1) It is suggested that all armament and shipbuilding establishments whose war profits were limited should be " mobilised." Certain provisions of military law (for discipline, etc.) should be applied. In each establishment there was to be a military commandant. After seven days' notice, every man should be compulsorily enrolled. The men were to wear uniform, and receive a medal for good service and a war bonus.

(2) All other skilled workmen in engineering and shipbuilding, who were willing to go anywhere and accept this discipline, were to be voluntarily enlisted and to undertake to come when they should be called up. They were to receive a subsistence allowance of 17s. 6d. a week if they were removed to a distance from their homes, and perhaps to wear a badge, but not uniform. It was proposed that they should be called up only if they were engaged on private work.

Under the first head, various proposals were drafted for empowering the commandant to declare all persons employed in the establishment to be subject to military law, and otherwise for forming an industrial army serving under conditions more or less similar to those prevailing in the army in the field.

---

[1] *Heads of Labour Policy.* Hist. Rec./R/300/38.

Mr. I. H. Mitchell, in a memorandum[1] recommending the idea of national service, wrote as follows: "Every man up to the age of thirty (the age could be extended as found necessary) should be required to register himself at, say, the Labour Exchange, so that whatever type of men were needed, in whatever numbers, whether for the field, the workshop, or the sea, they could be called upon at once under military conditions to perform what was required of them. Under this system I see no reason why thousands of young men now serving, but not required at the front, could not return to their work, put in some time each week at drill and firing and be ready to take the field immediately they were required.

"Under this system the mechanics required for quick transfer from place to place could be at once drafted under military conditions. The system would avoid the worst features of conscription, as those registered would not know whether they were wanted for civil duty in a workshop or military duty in the field, until they were actually called on. It would not interfere, and might be expressly explained as not interfering, with the present voluntary military method, which would go on as usual. If the voluntary method proves sufficient, all is well; if not, the men required would be there ready, and, in any case, the mechanics required for transfer would be obtainable at once."

The effect of Mr. Lloyd George's Manchester speech on 3 June, of the House of Lords debate already mentioned, and of the campaign for conscription carried on in certain middle-class newspapers, was such that it soon became clear that proposals of this kind would meet with strong opposition. The following paragraph from the June Report of the Executive Council of the Amalgamated Society of Engineers may be taken as a typical expression of the attitude of Labour:—

> "There is a feeling abroad that the underlying objective of the Coalition is to force military conscription on the country. The numerous organs of the Northcliffe Press are carrying on a vigorous agitation in favour of compulsory military service, and some folks are actively advocating industrial conscription. However, the Government has made no pronouncement, therefore we are unable to say what their views are on the question. Compulsory Service, military or industrial, is alien to the spirit and tradition of the British people, and any attempt to force this pernicious system on the nation would create serious difficulties for the Government."

In consequence of this state of feeling, the notion of enforcing military law upon the compulsorily enlisted employees of "mobilised" establishments was dropped. It remained to try a scheme of the second type—a Munitions Corps, enrolled under a voluntary agreement. The model followed was not the Liverpool Dockers Battalion, which was organised as a military unit and subject to the Army Act, but

[1] Hist. Rec./R/180/37.

rather the "Flying Squads" at Newcastle and Glasgow,[1] with the addition of commandants wielding disciplinary powers.

In his *Preliminary Note on Labour Policy* (4 June), Sir H. Llewellyn Smith suggested that a "King's Munition Corps" should be established under the Act, whose members would take one of two pledges: either (*a*) to work anywhere within a certain radius, or (*b*) to work anywhere, with a subsistence allowance if they were required to remove to a distance. The second class would form a special Flying Corps, perhaps with a uniform. The whole Corps would have a badge or brassard. The Corps might be raised by the Minister on a territorial basis. The members would be pledged to obey the commandant, and to do any work of which they were capable for the current rates, probably with a safeguard for their existing standard. The local commandants should, preferably but not necessarily, be officers of naval or military rank. They should be attached to districts, or even to great armament establishments, not as superseding the business management, but as autocratic referees, by whom cases of bad time-keeping, disobedience, drink, and other disciplinary offences, would be summarily dealt with. It was questioned whether the commandants should have any direct power of imprisonment for disciplinary offences against the employer; but it was to be an offence punishable by imprisonment to disobey the commandant's orders.

In the first Draft of the Bill (12 June), Section 7 (1) empowered the Minister to "arrange for the constitution of a King's Munition Corps by means of voluntary enrolment [through the agency of trades unions or otherwise] of persons undertaking to comply with the rules of the corps."

(2) The Minister might make rules for the regulation of the corps and the conditions of service, and in particular—

(*a*) for placing the corps and any divisions thereof under the control of munitions officers and officers subordinate to them;

(*b*) for securing obedience to such officers and defining their powers and duties;

(*c*) for the reference of any question of non-compliance with the rules to the munitions officer in command, and for the procedure to be followed;

(*d*) for the wearing of a badge or uniform;

(*e*) for the dismissal of any member by the munitions officer in command, with or without appeal.

(3) The work of the corps and its members was to be available for munitions supply either in controlled establishments or, subject to conditions determined by the Minister, in other establishments.

(4) The members of the corps might be billeted like soldiers.

[1] See Part III., Chap. III.

Such were the schemes in contemplation when negotiations were opened with the Trade Union leaders. The Minutes of the National Advisory Committee for 9 June record that, in consequence of certain representations which had been made to the Committee on the previous day by the Minister of Munitions, the object of which was vastly to increase the output of munitions of war, it was decided to convene a meeting of representatives of the trades who had attended the Treasury Conference of 17-19 March, with a view to reaching an agreement resulting in such a reorganisation of labour as would ensure a maximum output. The Committee drew up and submitted to the Minister a scheme to be handed to the delegates at the meeting.

The Committee's Memorandum[1] stated that the serious situation of the British and Russian Armies in consequence of shortage of munitions, as laid before them by Mr. Lloyd George on 8 June, demanded that all the resources of labour should be brought into play. The Trade Unions were responsible to the country for helping to secure a sufficient increase of output ; and the Government was responsible to the Unions and to the workers for safeguarding their established position and their interests by controlling profits and the prices of the necessaries of life.

There was no time either for a scheme of national registration, or for the extensive training of unskilled or semi-skilled workpeople. It must therefore be considered how the available resources could be effectively applied " without having to resort to any form of compulsion, even as a temporary expedient. The application of any form of compulsion to workmen concerned in the manufacture of munitions of war, except as a last and unavoidable resource, would be so disturbing as to defeat the object in view."

Accordingly, in order to give the fullest trial to a voluntary system of transfer of workmen from one shop or locality to another, the Committee suggested :—

(1) That the Minister should state the kind of munitions required, the area where they could most readily be manufactured, and the class and number of men necessary ;

(2) That in those areas the required workmen at present on private work should be invited to volunteer for service in controlled establishments ;

(3) That a list of volunteers should be submitted to their present employers, and to the Trade Unions, who should report to the local Munitions Committees as to the suitability of the workmen for the class of work proposed ;

(4) That the lists should be closed within seven days of the issue of the invitation.

It was provided, further, that rules for transference (subsistence allowance, etc.) similar to the Newcastle rules should be applied.

---

[1] *Acceleration of Supply of Munitions ; the Organisation of Labour.* HIST. REC./R/221.1/6. See Appendix II.

The Trade Unions were to assure the Government that any of their members selected by any local Munitions Committee for war work should be at once placed at the Government's disposal, at the rates of wages and allowances decided upon by that Committee. Such men were to continue at work at the factory or yard appointed by Government, and not to change their employment without the local Committee's consent. Men who refused to abide by these conditions were to be dealt with on lines agreed to by the local Committee.

Skilled workmen might be brought back from the Colours and less skilled and female labour used on minor operations in accordance with the Treasury Agreement, which was to be strictly observed.

The meeting of Trade Union Delegates was held on 10 June at the Offices of the Board of Trade. Mr. Lloyd George, who was accompanied by Mr. Arthur Henderson and Sir H. Llewellyn Smith, addressed the meeting.

He explained the need for a greatly increased quantity of high explosive shell for attacking trenches. The deficiency was attributable to two causes.

First, orders had not been spread widely enough. That was now to be remedied by taking every engineering shop that was engaged on unnecessary private work. The powers conferred on the Minister would be used to bring compulsion to bear on employers. But this would not meet the needs of the next few months, during which a delay must occur in turning over to the new work.

The second difficulty concerned labour. Unskilled labour would not suffice. More skilled men must be found and restrictions must be suspended. Employers were hindering by bringing pressure, which it was very hard to detect, on their skilled men not to leave their employment. To obtain the necessary labour, one course was to rely on voluntary methods, but he wanted some guarantee from the Unions. He wished to be able to requisition from a Union (say) the 75 millwrights who were then wanted to set up some machinery at the Birmingham Small Arms Factory. It was "not a question of universal conscription or of universal compulsory labour." The Government would prefer to use the Trade Union machinery; only they wanted to be sure that a requisition would be honoured. He suggested that the requisition should be backed by an order compelling the recalcitrant employer to release men who were needed.

Another thing that must be stopped was the stealing of labour.

There was a considerable amount of bad time-keeping. The Trade Union leaders had exhausted every art of persuasion, but had not been able to remedy it. He did not propose that the employers should have power to deal with bad time-keeping. "It would be very much better for the men themselves that you should have somebody sitting with representatives of the Trade Unions, with powers to deal with people who habitually absent themselves from their work. We would submit the names of those who would adjudicate on the cases, and you

would nominate your own men to sit with them. It is not a question of martial law; it is not a question of magistrates; it is rather a question of setting up a tribunal, after we have put the names before you and heard what objection you have to them. They would be men in whom you would have confidence that they would deal fairly, and the representatives of the Trade Unions would sit with them as assessors."

Finally, it was proposed to prevent stoppages of work; and he was going to put this to the employers on the following day.

After the Minister had retired, the National Advisory Committee's statement was put before the meeting. The following resolution was passed :—

> "That we accept and endorse the scheme of the National Advisory Committee, and further agree to empower the Committee to accept such extension of the proposals contained in these suggestions as may be necessary to provide a full supply of the necessary munitions required for the speedy termination of the war."

An amendment to omit "and further" to the end, was rejected by 53 votes to 16; and the motion was carried with seven dissentients.

It was further proposed that the main provisions of any Bill to be introduced to give effect to the scheme and suggestions outlined in Mr. Lloyd George's speech should be the subject of a further conference.

On 14 June, the Executive Council of the Amalgamated Society of Engineers addressed a letter[1] to the Right Hon. Arthur Henderson, on the transference of workmen from civil to munition work. After referring to the conference with Mr. Lloyd George on 10 June, the letter continued :—

> "The Executive Council of the Amalgamated Society of Engineers, representing 186,000 workmen, while accepting the memorandum of the National Advisory Committee on War Output submitted to the above-mentioned conference, place on record their entire opposition to any compulsory powers being adopted by the Government for the transference of workmen from commercial to munition work. The Executive Council further place on record their entire opposition to any system of fining as a result of loss of time, feeling sure that, so far as our members are concerned, they are working at the utmost extent of their powers.
>
> "The Executive Council, having regard to the urgent demands of the nation and the consequent need for securing the utmost mobility of labour, are prepared to recommend their members to accept the following scheme :—
>
> "1. That members of the Amalgamated Society of

[1] A.S.E. *Monthly Journal and Report*, July, 1915, p. 9.

Engineers now employed on work other than that of munitions of war shall be strongly recommended to offer themselves for voluntary removal from civil to war work, provided—

(*a*) that their consent is first obtained ;

(*b*) that their rates of pay, if in excess of the standard of the district to which they are transferred, shall in every case be fully guaranteed ;

(*c*) that no member shall at any time receive less than the standard rates of pay for the district to which he is removed ;

(*d*) that all railway fares shall be guaranteed from Government sources ;

(*e*) that a subsistence allowance of 17s. 6d. per week shall be paid to all men transferred to a district from which they cannot daily return to their homes ;

(*f*) that in the event of the workmen being able to return home each day, their travelling expenses shall be guaranteed and time occupied in travelling be paid for at least at the rate they are at the time receiving.

" 2. That the foregoing proposals shall operate for a period of three months in each case ; all volunteers under this scheme to have the right to renew the agreement for additional periods of three months, should the needs of the nation still require it.

" 3. Any person or persons who shall endeavour to bring force to bear upon workmen to prevent them from volunteering or those who for family or other reasons cannot volunteer under this scheme shall be immediately reported to the Local Armaments Committee, whose duty it shall be to at once forward the complaint to the Minister of Munitions' Department, Whitehall.

" 4. The Minister of Munitions shall have power to deal with any firm offending against clause 3."

At a meeting of the National Advisory Committee on 15 June it was stated that the Minister of Munitions had requested that a Delegate Meeting be held on the following day, to consider the draft proposals upon which a Bill was to be based to increase the output of war munitions by a system of transference of workmen, on the basis of the speech he had delivered to the Trade Union representatives on 10 June. The Societies represented at the Conference on that day had been summoned. A memorandum containing the outline proposals for legislation was considered by the Committee. The Committee later interviewed Sir John Simon with regard to the form and regulations to be used for the enrolment of volunteer workmen willing to go from private contract to Government work.

The Conference with Trade Union Delegates was held at 6 Whitehall Gardens on 16 June. With Mr. Lloyd George, Mr. Arthur Henderson, Sir H. Llewellyn Smith, Mr. William Brace, Mr. Beveridge, Mr. Wolff, and Mr. Davies were present.[1]

The Minister in his opening speech called attention to a Synopsis of the Bill, which was distributed to the meeting.[2] He pointed out that all the provisions applied only to controlled establishments, except those which referred to stoppage of work and arbitration, and the clause restricting the movement of men from one factory to another (Section 7).

He then propounded the scheme for Munition Volunteers. Copies of the schedule containing the form of undertaking to be given by the volunteer, and the conditions of employment, were in the hands of the meeting. It was explained that men already engaged on Government work would not be allowed to leave it under the scheme, though they might be skilled men doing unskilled work.

Mr. Lloyd George said that this scheme was " purely an attempt to avoid compulsion . . . It is an experiment, which, if it fails, will bring us face to face with compulsion. I think it would be a very good thing if the workmen knew that . . . If we cannot get workmen . . . then there is only one way of doing it, and that is by laying it down as a principle that every man during the War must render the service the State thinks he can render. But we will try this experiment first."

After a long discussion, the Minister retired, and the meeting considered the memoranda submitted.

A motion that the prohibition of strikes and lock-outs should apply only to munitions manufacture, was defeated by 54 votes to 16; and it was resolved, with 11 dissentients, that the prohibition should apply to all work and all trades during the present crisis.

It was agreed that the conditions for munitions work and private work should be identical. A proposal that restrictions should be relaxed on munitions work only was defeated.

The National Advisory Committee's proposal that all disputes should be dealt with under clause (2) of the Treasury Agreement was accepted. It was also agreed that arbitration under any of the three alternative methods should be speedy and compulsory.

The National Advisory Committee was empowered to carry through certain suggested amendments and additions to the Munitions of War Bill.

The outcome of these negotiations was the disappearance from the Bill of every feature suggestive of compulsion or of military

[1] Report in Hist. Rec./R/300/5. [2] Hist. Rec./R/221.1/6.

organisation and authority in connection with the Munition Volunteers.[1] The Section was reduced to a provision binding the workman who volunteered to work in a controlled establishment, to keep his undertaking, and prohibiting employers from hindering volunteering.

The Volunteer scheme was introduced in the first instance as a temporary measure. The week beginning 24 June was set apart for the enrolment. It was understood that, if at the end of that time enough labour had not been obtained, the Minister would be free to propose other methods, including possibly industrial conscription. To this extent the scheme was analogous to the Derby scheme of enlistment as an alternative to military conscription. In fact, however, although the full numbers were not forthcoming in the stipulated time, it was not found possible to resort to compulsion.

In introducing the Bill on 23 June, Mr. Lloyd George[2] said that in the course of frank discussion with the Trade Unions he had been "bound to point out that, if there were an inadequate supply of labour for the purpose of turning out the munitions which are necessary for the safety of the country, compulsion would be inevitable." The Unions had said that, if in seven days they could not get the men, they would admit that their case was considerably weakened. If any members of the House were opposed to compulsion, the best service they could do to voluntaryism would be to make this army a success. "If we succeed by these means, ... then the need for industrial compulsion will to that extent have been taken away."

At a later stage of the debate, the Minister, in reply to a speech made by Mr. J. A. Pease, said: "I certainly had not in my mind anything of the nature of a threat, but I am bound at the outset to say that if we cannot, by voluntary means, get the labour which is essential to the success of this country in a War upon which its life depends, we must use, as the ultimate resort, the means which every State has at its command to save its life."

These expressions appear to have revived some of the apprehensions felt by the Labour leaders. A deputation of the General Federation of Trade Unions, consisting of Messrs. O'Grady, Bell, Gwynne and Short, waited on the National Advisory Committee on 24 June. Mr. O'Grady stated that the impression prevailed that if, after seven days, during which Munitions Volunteers were called upon to enrol, the required number had not been obtained, industrial compulsion would be resorted to. The words used by Mr. Lloyd George in introducing the Bill seemed to justify this opinion, though the terms of the Bill itself did not.

Mr. Henderson pointed out that the Bill made no provision for compulsory service, which would require the assent of the Cabinet and fresh legislation.

It was decided that Mr. Henderson should draw up a statement for issue to the Press, to make this point clear and also the salient

[1] Including the provision for compulsory billeting. Mr. Lloyd George pointed out on 16 June that this would involve putting the men billeted under discipline.

[2] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 1201.

features of the circular drawn up by the National Advisory Committee and submitted to the Delegates' meeting on 16 June. The manifesto appeared in the Press on 28 June. It was endorsed by the Parliamentary Committee of the Trade Union Congress, and the General Federation of Trade Unions.[1]

In the Second Reading debate, the Bill was supported by the leading members of the Labour Party. No amendments to Section 6 were moved in Committee and the Clause went through without alteration.

VII. Section 7. Leaving Certificates.

Section 7 (1) reads as follows :—

> "A person shall not give employment to a workman, who has within the last previous six weeks or such other period as may be provided by Order of the Minister of Munitions as respects any class of establishment, been employed on or in connexion with munitions work in any establishment of a class to which the provisions of this section are applied by Order of the Minister of Munitions,[2] unless he holds a certificate from the employer by whom he was last so employed that he left work with the consent of his employer or a certificate from the munitions tribunal that the consent has been unreasonably withheld."

Sub-section (2) provides that a certificate may be granted by a munitions tribunal on complaint made by any workman or by his trade union representative that the employer's consent has been unreasonably withheld.

Sub-section (3) makes it an offence for any person to give employment in contravention of these provisions. The penalty under Section 14 (*e*) is a fine not exceeding £50.

This enactment was proposed as a means of checking the constant drifting of labour in the direction of higher wages—a tendency which not only interfered with regular work, but was likely to cause a general rise of wages. Cases occurred where men left skilled work to go to unskilled work on higher wages ; where men were drawn from permanent work of national value to temporary employment at higher rates ; and where men were finally lost to some industries by drifting into temporary employment, at the end of which they were taken for the Army.

One method of dealing with this problem is to equalise the rates of wages. This does not seem to have been contemplated, and, indeed, the attempt to introduce uniformity into the endless variety

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 1514.

[2] It is an important point that the provisions of this section, though it stands in Part II. of the Act, are not applicable only to controlled establishments. It is doubtful whether this fact was fully understood by the House of Commons.

of wages paid would have been to attack the question on its most intricate side. The first expedient to be adopted had been the prohibition of enticement by Regulation 8 B (29 April, 1915), of which an account has already been given.[1] The difficulty of proving enticement had made this measure ineffective. The next expedient was to tie the workman to his work by requiring a leaving certificate.

The advisability of this method had been under consideration in April, when Regulation 8 B was being framed; and the draft of this Regulation submitted to the Munitions of War Committee on 23 April[2] actually contained a provision for a leaving certificate. It prohibited the occupier of a factory or workshop engaged in munitions work or shipbuilding from inducing "any person employed in any such factory or workshop in the United Kingdom to leave his employment *without the previous written consent of his employer.*" The words in italics were, however, cut out of the draft. It was argued that the condition requiring the employer's consent would be much resented and would be difficult to control.

When the draft was submitted to the Treasury Solicitor, he expressed the opinion that neither the provisions of the Defence of the Realm (Consolidation) Act, 1914, nor those of the Amending Act of March, 1915, extended to enable the Army Council to make the proposed Regulation. It was, however, decided to leave open the question whether it was *ultra vires*, and to proceed in the hope that the Order would have a moral effect.[3]

A defect of Regulation 8 B was that the prohibition was laid only on "the occupier of a factory or workshop, the business carried on in which consists wholly or mainly in engineering, shipbuilding, or the production of arms, ammunition or explosives, or of substances required for the production thereof." There was nothing to prevent employers whose business was of any other kind from enticing labour from one another or from munitions and shipbuilding work.[4] Section 7 does not formally supersede Regulation 8 B or amend this defect. It attacks the problem in another way. But it is not itself open to a corresponding objection, since it provides that no person whatsoever is to give employment to a workman who has left munitions work without a certificate.

Before the end of May, another draft Regulation, embodying the principle of leaving certificates, had been prepared by the Board of Trade. This draft, dated 22 May, read as follows:—

> "8 C (1) The occupier of a factory or workshop the business carried on in which consists, wholly or mainly, in

[1] See above, Part III., Chap. V. [2] M.C. 6.

[3] Correspondence in E.27867 (Board of Trade).

[4] Thus, at the Minister's conference with the Manchester Board of Management on 10 August, 1915, the representative of a Lancashire firm doing munitions work complained that a company manufacturing concrete was attracting away his labourers by offering an extra 1d. an hour, and that Regulation 8 B gave no protection.

engineering, shipbuilding, or the production of arms, ammunition or explosives, or of substances required for the production thereof, shall not, nor shall any person on behalf of the occupier of such a factory or workshop, engage or employ any workman who is, or has within the last preceding six weeks been employed on work for any Government Department or otherwise serving war purposes, unless the person by whom he is or was so employed gives or has given his consent in writing to the workman leaving such employment, which consent shall not be unreasonably withheld.

" (2) Where a workman in an insured trade employed on work for a Government Department or otherwise serving war purposes leaves such employment without the consent of his employer, the employer, in lieu of returning his unemployment book to the workman in accordance with regulation 5 (1) of the Unemployment Regulations, shall send the book to the local office of the Unemployment Fund with a statement of the reasons why he withholds his consent to the workman leaving his employment.

" (3) Any question between a workman and an employer as to whether the consent of the employer to the workman leaving his employment is unreasonably withheld under this regulation shall be determined, in accordance with rules made by the Board of Trade, by the authorities constituted to deal with questions in connection with claims for unemployment benefit under Part II. of the National Insurance Act, 1911.

" (4) If any person contravenes any of the provisions of this regulation he shall be guilty of an offence against these regulations."

The draft Order containing this regulation was never issued. It was decided to incorporate the required provision in the Act.

In introducing the Bill, the Minister referred to this Section in the following terms[1] :—

" The third thing is the prevention of the practice which has done more to destroy discipline in the yards than almost anything—that is the practice of employers in pilfering each other's men. It is absolutely impossible to obtain any discipline or control over men, if a man who may be either slack or disobedient to a reasonable order is able to walk out at the moment, go to the works which are only five or ten minutes off, and be welcomed with open arms without any questions being asked. That must be stopped. It is a practice for which the employers are responsible far more than the men."

This passage reveals that the purpose behind this enactment was really different from that of Regulation 8 B. The original complaint

[1] *Parliamentary Debates* 1915), *H. of C.*, LXXII., 1199.

had come from employers whose men were being enticed to Admiralty or munitions work, especially by the large armament firms, to the prejudice of other Government work.[1] It was a question of the distribution of the available labour supply. In Section 7 the method is different: "discipline"—or rather the retention of labour where its services were most needed—is to be secured by taking away the workman's normal freedom to leave his employer on any ground that seems to him sufficient, without having to prove its sufficiency before a tribunal. This is a totally different matter from the pilfering by employers of one another's men by the offer of higher wages—a practice which can correctly be described as one for which employers, rather than workmen, are responsible. Section 7 is only in form a prohibition laid upon employers. In substance it limits, not the employer's freedom, but the workmen's, and it actually invests the employer with new and irresponsible powers.

On the Second Reading, Mr. Hodge[2] said that the Labour Party thought it unfair that, while the workman could not leave his employment without a certificate, the employer was left free to dismiss him. They considered that there ought to be more equality of treatment; and objections had also been raised to the period being as long as six weeks.

Mr. Pringle[3] maintained that Section 7 virtually extinguished the market for free labour. It amounted to this, "that there is no competition for labour, the only commodity which the worker has to sell, whereas there is open competition for every commodity which he has to buy." He claimed that, before the representatives of the workmen consented to these sacrifices, they were entitled to a Parliamentary pledge from the Government that there should be tribunals for fixing rents, and some means of regulating the prices of commodities.

In order to give effect to the objections felt by the Labour Party to inequality of treatment, Mr. Hodge[4] moved in Committee the following amendment:—

> "At the end of Sub-section (2), to add:—
>
> "Any person who is employed working in or about a controlled establishment on munitions work shall not discharge or suspend any such workman without the previous consent of the Munitions Tribunal."

Mr. Lloyd George opposed the amendment on the ground that it would subvert discipline, and that, labour being so scarce, men were not likely to be dismissed unless the case were overwhelming. The amendment was withdrawn.

The actual working of the measure, however, proved that the Labour Party were not wrong in anticipating that trouble would arise.

---

[1] See Part II., Chap I., Section VI.

[2] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 1519.

[3] *Ibid.*, 1600, 1601.

[4] *Ibid.*, 2071.

It was not long before complaints were heard that the workman could not leave his employment on grounds judged to be insufficient by his employer or by a tribunal, on pain of six weeks' unemployment; but a manager or foreman could dismiss a man on grounds which seemed frivolous or unfair to the man or to his fellows. The onus lay on the man to convince a tribunal that the employer was unreasonable. Even if he succeeded in doing so, the employer was liable to no penalty, however unreasonable his refusal of a certificate might have been,[1] while the man was unjustly punished by being debarred from obtaining other employment during the interval before his claim was vindicated. The natural remedy of a strike was forbidden by the Act. The total effect was to arm employers, managers, and foremen with arbitrary powers that were certain to be abused in unscrupulous hands.

The reality of such abuses was acknowledged by the Government when it provided safeguards against them in the Amending Act of 1916. Although by that time Section 7 had acquired in certain quarters an unpopularity which no concessions could eradicate, these amendments went far to remove the reasonable grounds of complaint. The essential principle of the leaving certificate might be justified by the argument that, in the interests of rapid and regular production, it was necessary to impose some check on the drifting of labour, and that this could not be done without a serious curtailment of normal liberty. The defenders of Section 7 might urge that, in resenting restriction upon his freedom of movement, the workman was simply rebelling against an inevitable consequence of war conditions. The final repeal of the Section left the problem unsolved, and it was found necessary to aim at securing the same results by methods less direct and no more popular.

VIII. Section 10. Restriction of Employment.

Section 7, as has been seen, was designed to prevent workmen from leaving munitions work without their employers' consent. Section 10 is a complementary provision intended to compel workmen to leave private work without either their employers' or their own consent. It is a further step in the direction of the compulsory diversion of labour from commercial to Government work,[2] though the powers obtained have not actually been used for that purpose.

This Section amends the Defence of the Realm (Amendment)

[1] An amendment empowering a Munitions Tribunal, when it granted a certificate, to direct the employer to pay compensation to the workman, was moved by Mr. King. Mr. Lloyd George opposed it on the ground that the workman would be still employed, since his appeal was against a refusal to let him leave his employment. The amendment was withdrawn. (*Parliamentary Debates* (1915), *H. of C.*, LXXII., 2071.)

[2] It was reported in June that in the engineering trade 233,000, or 43% of the persons occupied, were still engaged on private work. (Memorandum on *The position leading up to the introduction of the Bill*, HIST. REC./R/221.1/6.)

No. 2 Act (March, 1915), Section 1 (1) (*d*), by adding the words in italics.[1] It empowers the Admiralty and the Army Council

> " (*d*) to regulate or restrict the carrying on of any work in any factory, workshop, *or other premises, or the engagement or employment of any workman or all or any classes of workmen therein,* or to remove the plant therefrom with a view to *maintaining or* increasing the production of munitions in other factories, workshops, *or premises, or to regulate and control the supply of metals and material that may be required for any articles for use in war.*"

The effect of the addition in the earlier part of this paragraph was to restore its provisions to very nearly the same form as they had taken in the first draft of the Amending Act of March.[2] The paragraph had originally read as follows :—

> " (*d*) to *prohibit* or restrict *the employment* in any factory or workshop *of any workman or class of workman whose services may be required* for the production of war material."

These words had been struck out before the Bill was introduced, because it was feared that the explicit avowal of an intention to extinguish employment on commercial work in this way would be resented by Labour. The substitution of the words, " the carrying on of work," disguised this intention, and, incidentally, so weakened the powers obtained that the prohibition of enticement under Regulation 8 B proved to be *ultra vires*. Section 10 brings that regulation *intra vires ;* but its main purpose was to facilitate the compulsory displacement of labour, so as to make it available for munitions work.

An application for powers of compulsory transfer had been made on 1 May by Captain Power, the Admiralty representative on the North East Coast Armaments Committee. In a letter to the Admiralty he wrote :—" The Prime Minister told me the other day[3] that the Admiralty have full authority to use, under the Defence of the Realm Act, compulsion in withdrawing men from private work for Government work, and said that, as Admiralty representative, I had that authority also. I shall be glad to hear from you whether the exercise of such authority on my part would be approved by their Lordships in case such a course becomes necessary. The difficulties of getting labour for our urgent work without using some form of compulsion are very great, and until such compulsion is put in force I see no prospect of getting any adequate increase. One plan that suggests itself to us is to order all or any firms to discharge forthwith, say, 25 per cent. of the men employed on private work, who would then be mobilised by their Trade Union delegates, and drafted in accordance with the order of the Committee."

The Admiralty representatives on the Munitions of War Committee raised this question at its fourth meeting. In a memorandum

---

[1] A few verbal changes of no substantial importance are also made.

[2] See Part II., Chap. III., Section II.

[3] Presumably 20 April, the date of the Prime Minister's visit to Newcastle.

submitted to the Committee on that occasion, the opinion is expressed that the powers under the Act and the corresponding Regulation 8 A (*b*), "to regulate or restrict the carrying on of any work in any factory or workshop . . . . with a view to increasing the production of war material in other factories or workshops," appeared to cover an order to an employer to restrict part of his work by ceasing to employ a number of men. The men, however, could not be compelled to go to other work. It was suggested that a formal order, specifying the nature of the restriction, would be necessary. Possibly a threat to use the power might be preferable to an actual exercise of it.

The legal point was referred on 3 May to the Treasury Solicitor, who was asked to state an opinion on the following points[1]:—

> "(1) Assuming that an order were made by the Army Council, could it direct the release of men without reference to the work on which they were engaged?
>
> "(2) If this is not possible, would it be necessary to make an individual order in each case?
>
> "(3) Assuming that an individual order would be necessary, would it be possible to avoid the great practical difficulties that this would involve, by attempting to arrive at an amicable arrangement with the firms, using as a lever the power given by the Regulation (8 A (*b*)) to close down factories altogether?"

The Treasury Solicitor held (1) that, since war production in other factories could not be increased by mere restriction of work, but only by freeing labour or plant or possibly raw material, the Regulation must be taken as giving power to make an order for the reduction of labour in a factory, either by a certain percentage or by a certain number. Such an order should be addressed to each manufacturer concerned, and should specify both a date for compliance and the factories in such a way that they could be identified. (2) An individual order would, he thought, be necessary to the extent above indicated. He advised that strict legality should be observed. In the present case, the order might be in a general form, requiring, for instance, the reduction of employment of hands of a certain character by a certain percentage; but the circumstances of firms might differ too much for this to be practicable.

It appears to have been considered advisable to strengthen paragraph (*d*) in such a way as to make it indisputably legal to prohibit the employment of any particular man in any particular shop, and so make him available for service elsewhere. No power, however, was taken to transfer the labour so displaced to munitions work.

This Section passed through the House of Commons without attracting much attention. The only amendment made was the addition of the final words, giving power to regulate and control the supply of metals and material.[2]

---

[1] The reference and the Treasury Solicitor's opinion were printed for the Committee. (M.C. 12.)

[2] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 2074.

IX. Sections 14 and 15. Penalties and Munitions Tribunals.

Section 15 lays down the constitution and powers of Munitions Tribunals.

A Munitions Tribunal is to be constituted as and when occasion requires, and to consist of a person appointed by the Minister (or by the Admiralty for offences in docks declared to be controlled establishments), sitting with two or other even number of assessors, chosen in equal numbers from two panels constituted by the Minister, the one representing employers, the other workmen.

The purpose which lay behind this institution was explained by Mr. Lloyd George as follows[1]:—

> "If you have a voluntary army of workers, there must be a means of enforcing contracts. It is no use having 20,000 or 30,000 men who say, 'We will go anywhere we are told,' if, when the time comes, they refuse and you cannot compel them. They volunteer to enter into this contract, but once they enter into it, it is a contract and it must be enforceable. . . . .
>
> "The other point of the Bill is that we take power to establish discipline in the workshops. Here, again, we discussed this matter with the Trade Union representatives, and we are not going beyond the agreement we have entered into. They admit that, where men who voluntarily go into this army habitually absent themselves and make bad time when they know that the work is very urgent for the country, there ought to be some means of enforcing better time. It is proposed that there should be a Munitions Court set up with an employer and a Trade Union representative sitting upon it as assessors, and a president appointed by the Government. They will decide in these cases where a man has a reasonable excuse for absenting himself habitually, and they will have the power of inflicting a penalty." The Court was also to decide when a leaving certificate had been withheld unreasonably.

The history of the Bill shows that the principal function for which the Munitions Tribunal was designed was to check bad time-keeping. In ordinary circumstances, if a man keeps bad time, the employer has the simple remedy of dismissing him. Under war conditions, the extreme shortage of labour had made this impossible, since the man dismissed knew he could at once find work elsewhere. It was therefore considered necessary to strengthen the employer's position by instituting some system of "discipline."

A considerable body of evidence bearing on the extent of bad time-keeping had been collected in April in a White Paper.[2] The great bulk of this evidence referred to the shipping areas, and it was collected with a view to illustrating the influence of drink. Little more

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 1202.

[2] *Report and Statistics of Bad Time kept in Shipbuilding, Munitions, and Transport Areas* (1 May, 1915).

than one page out of thirty dealt with armament works. Here it was stated that the reports received indicated that "much time was avoidably lost in certain works," but that "the great majority of the workmen were above reproach and their action was praiseworthy."

Reference has already been made to Mr. W. L. Hichens' Memorandum on this subject.[1] He stated that, on the whole, time-keeping was better than before the War, but not so good as it should be. Employers were asking too much, and getting too little. Men could not work overtime and on Saturday afternoons and Sundays continuously. Yet an employer who did not offer overtime, which carried higher rates of pay, risked losing his men. The men preferred to work for double pay on Sundays, and stay out some other day; and many would only work till they had made enough money for the week. The result was that the hours worked were irregular generally, and in some trades inadequate. The irregularity threw out of gear the delicate machine of industrial organisation. If regular hours were worked, he believed that overtime would not be necessary, or indeed possible, save on exceptional occasions, while output would be greatly increased.

Mr. Hichens thought that the influence of drink had been over-rated. In his own experience there was less actual drunkenness than before the War, though there appeared to be a good deal of heavy drinking in some parts. He recommended that opportunities for drinking just before working hours should be universally removed by closing orders.

Mr. I. H. Mitchell, in a memorandum written at the beginning of June[2] stated that Government Arsenals and Dockyards were practically free from all the troubles that hampered private firms. "The restrictive rules are reduced to a minimum in Government shops[3]; irregular attendance does not exist; there is no drink problem among the mechanics; strikes and lock-outs are almost unknown." He suggested that all these evils could be remedied by assimilating private armament works to Government establishments, beginning with the curtailment of profits.

When the Bill was drafted, the notion was to assimilate munition works not so much to the Arsenal as to the Army. Bad time-keeping was to be dealt with by a system of discipline resembling as closely as possible that which prevails in a military unit. This part of the Act took its colour from the ideal of industrial conscription.

In the original draft, the Minister was authorised to appoint Munitions Officers and assign to them such duties and districts as he might determine. Such officers were to be empowered to hold command in the proposed Munition Corps; to issue orders to its members; to take cognisance of questions referred to them of non-compliance with the rules of the corps; to dismiss members of the

[1] See above, p. 8.

[2] HIST. REC./R/180/37.

[3] So far as Woolwich Arsenal is concerned, this statement perhaps needs qualification.

corps with or without appeal; and to give or withhold consent to proposed changes of wages, etc., in a controlled establishment, or to require that such proposals should be submitted to a referee. Apart from the last-mentioned function, the authority explicitly assigned to the Munitions Officer was confined to the members of the corps, who might be only a portion of the employees in any establishment. As this first draft did not contain the Penalty Section, it is not clear what authority it was then intended should enforce compliance with the provisions of Part II., though penalties of a fine were attached to certain of these provisions. The fines would presumably have been recoverable in the ordinary courts of law.

The disappearance of the Munitions Officer followed upon the abandonment of the idea of a Munitions Corps. This entailed two changes made in the Bill as introduced.

In the first place, the penalties for offences under the Act were collected into one Section (Section 14 of the Act). These offences were of two classes :—

(1) (*a*) Contravention of, or failure to comply with, an award;
(*b*) Contravention of the provision prohibiting lock-outs;
(*c*) Contravention of the provision prohibiting strikes;
(*e*) Contravention of, or failure to comply with, any other provision of the Act.

In each of these cases the penalty was a fine to be inflicted *on summary conviction*, and therefore recoverable in the ordinary courts.

(2) (*d*) Contravention of, or failure to comply with, any regulations in a controlled establishment or any undertaking given by a workman under Part II.

In this case the fine (not exceeding £3) was to be recoverable only before a Munitions Tribunal.

In the second place, the necessary tribunals were provided, to take the place of the Munitions Officer, who had now been eliminated. The tribunals were to take cognisance of the offences under (*d*), and to inflict fines (which might be deducted from wages), but not imprisonment. They could also hear complaints from workmen under Section 7 and grant leaving certificates. Thus, apart from leaving certificates, their functions were originally confined to enforcing the regulations in controlled establishments and workmen's undertakings under Part II. The figure for the maximum penalty under (*d*) was fixed at £3 because this was a usual figure for fines connected with matters of domestic discipline between a Trade Union and its members.[1]

On the Second Reading, Mr. Duke made an important speech dealing with the constitution and powers of the tribunals. He admitted that the proposed tribunals would be dignified and would carry weight throughout the country. But it did not follow that such a body would carry weight in a particular factory. He suggested

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 1550 (Sir John Simon).

that the confidence reposed by organised Labour in the Government and in Parliament might well be repaid " by enabling the men who are concerned in the class of cases to which reference has been made, to themselves nominate a tribunal to deal with matters of this kind." He thought that a domestic court consisting of workmen belonging to each factory might be able to remove many small causes of friction, which might otherwise ripen into a strike.[1]

At the Committee stage, Mr. Henderson[2] said that the Government desired to follow Mr. Duke's suggestions as far as possible, and to have all the offences enumerated in Section 14 dealt with by what Mr. Duke had called a " domestic court." Mr. Henderson accordingly moved a series of amendments. These left untouched the class of tribunal already provided for in the Bill, which was still to have jurisdiction over the offences under (*d*). The effect of the amendments was to add a new class of tribunals (afterwards called General Munitions Tribunals) which were to deal with all the offences under (*a*), (*b*), (*c*), and (*e*). These offences were thus removed from the cognisance of the ordinary Courts of Justice ; and all fines for offences under the Act now became recoverable only before a Munitions Tribunal of one or the other class.

Mr. Henderson explained that it was intended that the new (General) tribunals should be smaller than those of the other (Local) class ; and that where a General Tribunal had been set up, a Local Tribunal would not be required. There might be ten or a dozen of the former ; and perhaps sixty or seventy of the latter.

It will be observed that this change did not really give effect to Mr. Duke's proposal that the men of each factory should themselves nominate a tribunal of their fellow workmen, and that " where there is organised labour, the men who are going to pay penalties, if they have to pay them, shall be judged by their comrades, who shall be assessors." Whether such a plan would have worked well or ill is a question that cannot be answered since the experiment was not made. Under the Act, every tribunal consists of a person appointed by the Minister, sitting with assessors chosen by the Minister, from two panels constituted by the Minister. The amendments were, however, welcomed by the Labour Party as at least an improvement on the method of assigning the jurisdiction over these offences to the ordinary courts.

X. Minor Provisions of the Act.

The most important provisions of the Act have now been reviewed. It remains to record some minor enactments which have not yet been noticed.

Section 8 empowers the Minister to make rules with regard to the issue of badges, and to prohibit unauthorised badges.

The Section was introduced by Mr. Lloyd George at the Committee Stage.[3] He pointed out that the absence of a systematic

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 1520.
[2] *Ibid.*, 2077. [3] *Ibid.*, 2088.

system of badging had been responsible for the loss to engineering production of many indispensable men; and that unauthorised badges had been issued to persons who ought not to have been protected.

The intention was to issue badges only to men genuinely engaged on Government work.

SECTION 9 provides for the application of Part II. to Admiralty Docks.

The addition of this clause was made at the request of the Admiralty. No question arose as to the applicability of Part I., which could be made to apply to strikes and lock-outs in the docks, if necessity arose.

The possibility of including hands employed on ships hired by the Admiralty for transport service was also considered; but difficulty was felt about defining the undertaking of which the profits were to be limited. Further, the clause suggesting alteration of wages was inapplicable, as it was proposed that all employment on these ships should be under an agreement lasting for the duration of the War and admitting of no change of wages.[1]

SECTION 11 requires the owner of any establishment to furnish information, if so required, as to

(1) The numbers and classes of persons employed;
(2) The numbers and classes of machines;
(3) The nature of the work on which workpeople or machines are engaged;
(4) Any other matters about which the Minister might require to be informed.

SECTION 12, in the Bill as introduced, made it an offence

(1) For employers, owners, and workmen to make false statements, give false certificates, etc.

(2) To wear a badge in a manner calculated to deceive.

(2) was cut out in Committee.[2]

SECTION 13 provides for the payment of travelling and other expenses incurred by members of arbitration tribunals, munitions tribunals, referees, and officers required in connection with such tribunals. It was passed without alteration.

SECTION 16 empowers any company, association, or body of persons to carry on munitions work during the War, notwithstanding anything contained in any Act, order, or instrument, by or under which it is constituted or regulated.

The Section was introduced in Committee.[3] It was pointed out that some companies desirous of making munitions had been prevented by the fact that their objects did not include such work.

---

[1] HIST. REC./R/221.1/7.

[2] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 2075. [3] *Ibid.*, 2112.

SECTION 17 deals with procedure in regard to laying before Parliament rules made under the Act. It was added at the Committee stage.

SECTION 18 applies the Documentary Evidence Act, 1868, to the Ministry of Munitions.

SECTION 20 (1) gives the short title; (2) provides that the Act shall have effect only so long as the Minister's office and the Ministry exist, except that Part 1 shall continue to apply for 12 months after the conclusion of the War to differences arising in relation to the carrying out of the Employers' Guarantee of Restitution (Schedule II.).[1]

NEW CLAUSE.—At the Committee stage a new clause was brought up:

> "*Transfer of Powers.*—As soon after the date of the passing of this Act as may be found expedient all powers at present exercised by the Ordnance Department of the War Office in respect to the supply of munitions of war shall be transferred to the new Ministry of Munitions."[2]

This motion was made the occasion of an attack from the front Opposition bench on the Ordnance Department, the Master-General of the Ordnance, Lord Kitchener, and the War Office in general. Mr. Lloyd George deprecated these attacks, and stated that he preferred to build up the Department gradually, and then apply for powers to take over War Office functions. The clause was withdrawn.

XI. Conclusion.

The main provisions of the Munitions of War Act were shaped at private conferences with the Trade Union representatives. In the process of bargaining and compromise, the bolder features were softened or obliterated, the clauses became complex, and, without the closest study, it was not easy to measure the extent, or to forecast the operation, of the powers it conferred on the Government and the employer. Presented to the House of Commons as an agreed measure, the Bill escaped public criticism from the accredited guardians of the workman's interests. It was supported by the leaders of the Labour Party, and no other group of members had any motive for opposition.

Only a single day was given to the debate on the Second Reading. In spite of Sir John Simon's lucid exposition, it is evident that the House was unable to take in all the significance of the measure. Mistaken statements about the effect of its provisions were made even by Ministers, and passed without challenge. The only serious criticism came from two speakers: Mr. Snowden, who was afterwards rebuked by the Labour Party, and Mr. Pringle, who spoke at a late hour and was heard with impatience. Amendments of great importance were passed in Committee, some of which left flaws in the measure

[1] See above, p. 19.

[2] *Parliamentary Debates* (1915), *H. of C.*, LXXII., 2090.

such as could not have survived the scrutiny of any competent lawyer, if time had been allowed to consider their bearings.

The Bill passed through all stages in the House of Lords in two days, and, after a nugatory discussion in that chamber, became law on 2 July. Together with the Ministry of Munitions Act and the Order in Council defining the duties and powers of the Minister, the Act constituted the charter of the new Department.

This is neither the time nor the place to offer any general verdict on the policy embodied in a measure whose merits and defects are unhappily still involved in a cloud of controversy. It may, however, safely be described as a bold attempt to solve the problem of the control of labour, which must confront any Government waging war with the whole industrial resources of the country. The extent to which control could be carried at any given moment without exciting reasonable or factious opposition to a dangerous point, has throughout the War depended on numerous psychological factors which no Government could gauge with any certainty beforehand, and which in the event have constantly taken even well-informed observers by surprise. Control has sometimes been accepted with unexpected docility, sometimes resented with unexpected violence. That the inevitable sacrifice of private liberty to public interest must occasion many troubles in a country which entered the War profoundly attached to individual freedom, could easily have been foreseen by anyone who even dimly discerned how radical a readjustment of all English ideas would be entailed by the magnitude of the struggle. In a field where too rapid and sudden advances would have meant irremediable disaster, the Government had no alternative but to feel its way along the path of negotiation, bargaining, and timely concession. The spirit in which Ministers and Labour leaders co-operated weathered the critical points where a failure of tact or goodwill on either side might have shipwrecked the State. That the State has not been shipwrecked is in itself a strong answer to those critics of the Act and of the Labour department which administered it, who are disposed to magnify the troubles that attract public attention and to ignore the immense volume of work that has all the time been going forward without friction and without pause.

APPENDICES.

APPENDIX I.

Munitions of War Act, 1915.

[5 & 6 Geo. 5. Ch. 54.]

ARRANGEMENT OF SECTIONS.

Part I.

Section.

Part II.

Part III.

An Act to make provision for furthering the efficient manufacture, transport, and supply of Munitions for the present War; and for purposes incidental thereto.

[2nd July, 1915].

BE it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

PART I.

1.—(1) If any difference exists or is apprehended between any employer and persons employed, or between any two or more classes of persons employed, and the difference is one to which this Part of this Act applies, that difference, if not determined by the parties directly concerned or their representatives or under existing agreements, may be reported to the Board of Trade, by or on behalf of either party to the difference, and the decision of the Board of Trade as to whether a difference has been so reported to them or not, and as to the time at which a difference has been so reported, shall be conclusive for all purposes.

(2) The Board of Trade shall consider any difference so reported and take any steps which seem to them expedient to promote a settlement of the difference, and, in any case in which they think fit, may refer the matter for settlement either in accordance with the provision of the First Schedule to this Act or, if in their opinion suitable means for settlement already exist in pursuance of any agreement between employers and persons employed, for settlement in accordance with those means.

(3) Where a matter is referred under the last foregoing subsection for settlement otherwise than in accordance with the provisions of the First Schedule to this Act, and the settlement is in the opinion of the Board of Trade unduly delayed, the Board may annul the reference and substitute therefor a reference in accordance with the provisions of the said Schedule.

(4) The award on any such settlement shall be binding both on employers and employed and may be retrospective; and if any employer, or person employed, thereafter acts in contravention of, or fails to comply with, the award, he shall be guilty of an offence under this Act.

2.—(1) An employer shall not declare, cause or take part in a lock-out, and a person employed shall not take part in a strike, in connexion with any difference to which this Part of this Act applies, unless the difference has been reported to the Board of Trade, and twenty-one days have elapsed since the date of the report, and the difference has not during that time been referred by the Board of Trade for settlement in accordance with this Act.

(2) If any person acts in contravention of this section, he shall be guilty of an offence under this Act.

3. The differences to which this Part of this Act applies are differences as to rates of wages, hours of work, or otherwise as to terms or conditions of or affecting employment on the manufacture or repair of arms, ammunition, ships, vehicles, aircraft, or any other articles required for use in war, or of the metals, machines, or tools required for that manufacture or repair (in this Act referred to as munitions work) ; and also any differences as to rates of wages, hours of work, or otherwise as to terms or conditions of or affecting employment on any other work of any description, if this Part of this Act is applied to such a difference by His Majesty by Proclamation on the ground that in the opinion of His Majesty the existence or continuance of the difference is directly or indirectly prejudicial to the manufacture, transport, or supply of Munitions of War.

This Part of this Act may be so applied to such a difference at any time, whether a lock-out or strike is in existence in connexion with the difference to which it is applied or not :

Provided that if in the case of any industry the Minister of Munitions is satisfied that effective means exist to secure the settlement without stoppage of any difference arising on work other than on munitions work, no proclamation shall be made under this section with respect to any such difference.

When this Part of this Act is applied to any difference concerning work other than munitions work the conditions of labour and the remuneration thereof prevailing before the difference arose shall be continued until the said difference is settled in accordance with the provisions of this Part of this Act.

Part II.

4. If the Minister of Munitions considers it expedient for the purpose of the successful prosecution of the war that any establishment in which munitions work is carried on should be subject to the special provisions as to limitation of employers' profits and control of persons employed and other matters contained in this section, he may make an order declaring that establishment to be a controlled establishment, and on such order being made the following provisions shall apply thereto :—

(1) Any excess of the net profits of the controlled establishment over the amount divisible under this Act, as ascertained in accordance with the provisions of this Act, shall be paid into the Exchequer.

(2) Any proposal for any change in the rate of wages, salary, or other emoluments of any class of persons employed in the establishment, or of any persons engaged in the management or the direction of the establishment (other than a change for giving effect to any Government conditions as to fair wages or to any agreement between the

owner of the establishment and the workmen which was made before the twenty-third day of June, nineteen hundred and fifteen), shall be submitted to the Minister of Munitions, who may withhold his consent within fourteen days of the date of the submission :

Provided that if the Minister of Munitions so directs, or if the Minister's consent is withheld and the persons proposing the change so require, the matter shall be referred for settlement in accordance with the provisions of the First Schedule to this Act, and the consent of the arbitration tribunal, if given, shall in that case have the same effect as the consent of the Minister of Munitions.

If the owner of the establishment or any contractor or sub-contractor employing labour therein makes any such change, or attempts to make any such change, without submitting the proposal for the change to the Minister of Munitions or when the consent of the Minister has been withheld, he shall be guilty of an offence under this Act.

(3) Any rule, practice, or custom not having the force of law which tends to restrict production or employment shall be suspended in the establishment, and if any person induces or attempts to induce any other person (whether any particular person or generally) to comply, or continue to comply, with such a rule, practice, or custom, that person shall be guilty of an offence under this Act.

If any question arises whether any rule, practice or custom is a rule, practice or custom which tends to restrict production or employment, that question shall be referred to the Board of Trade, and the Board of Trade shall either determine the question themselves or, if they think it expedient or either party requires it, refer the question for settlement in accordance with the provisions contained in the First Schedule to this Act. The decision of the Board of Trade or arbitration tribunal, as the case may be, shall be conclusive for all purposes.

(4) The owner of the establishment shall be deemed to have entered into an undertaking to carry out the provisions set out in the Second Schedule to this Act, and any owner or contractor or sub-contractor who breaks or attempts to break such an undertaking shall be guilty of an offence under this Act.

(5) The employer and every person employed in the establishment shall comply with any regulations made applicable to that establishment by the Minister of Munitions with respect to the general ordering of the work in the establishment with a view to attaining and maintaining a proper standard of efficiency and with respect to the due observance of the rules of the establishment.

If the employer or any person so employed acts in contravention of or fails to comply with any such regulation, that employer or person shall be guilty of an offence under this Act.

(6) The owners of an establishment shall have power, notwithstanding anything in any Act, Order, or deed under which they are governed, to do all things necessary for compliance with any provisions of this section, and any owner of an establishment shall comply with any reasonable requirements of the Minister of Munitions as to information or otherwise made for the purposes of this section, and, if he fails to do so, shall be guilty of an offence under this Act.

Where in any establishment munitions work is carried on in some part of the establishment but not in other parts, the Minister of Munitions may, if he considers that it is practicable to do so, treat any part of the establishment in which munitions work is not carried on as a separate establishment, and the provisions of this Act shall take effect accordingly.

5.—(1) The net profits of a controlled establishment shall be ascertained in accordance with the provisions of this section and rules made thereunder and the amount of profits divisible under this Act shall be taken to be an amount exceeding by one-fifth the standard amount of profits.

(2) The standard amount of profits for any period shall be taken to be the average of the amount of the net profits for the two financial years of the establishment completed next before the outbreak of the war or a proportionate part thereof.

(3) If in any case it appears or is represented to the Minister of Munitions that the net profits or losses of all or any other establishments belonging to the same owner should be brought into account, or that the average under this section affords or may afford an unfair standard of comparison or affords no standard of comparison, the Minister may, if he thinks just, allow those net profits or losses to be brought into account, or substitute for the average such an amount as the standard amount of profits as may be agreed upon with the owner of the establishment.

The Minister of Munitions may, if he thinks fit, and shall, if the owner of the establishment so requires, refer the matter to be determined by a referee or board of referees appointed or designated by him for the purpose, and the decision of the referee or board shall be conclusive on the matter for all purposes.

(4) The Minister of Munitions may make rules for carrying the provisions of this section into effect, and these rules shall provide for due consideration being given in carrying out the provisions of this section as respects any establishment to any special circumstances such as increase of output, provision of new machinery or plant, alteration of capital or other matters which require special consideration in relation to the particular establishment.

6.—(1) If any workman in accordance with arrangements made by the Minister of Munitions with or on behalf of trade unions enters into an undertaking with the Minister of Munitions that he will work at any controlled establishment to which he may be assigned by the Minister, and be subject to the penalty imposed by this Act if he acts in contravention of or fails to comply with the undertaking, that workman shall if he acts in contravention of or fails to comply with his undertaking be guilty of an offence under this Act.

(2) If any employer dissuades or attempts to dissuade a workman in his employment from entering into an undertaking under this section, or retains or offers to retain in his employment any workman who has entered into such an undertaking after he has received notice from the Minister of Munitions that the workman is to work at some other establishment, that employer shall be guilty of an offence under this Act.

7.—(1) A person shall not give employment to a workman, who has within the last previous six weeks, or such other period as may be provided by Order of the Minister of Munitions as respects any class of establishment, been employed on or in connexion with munitions work in any establishment of a class to which the provisions of this section are applied by Order of the Minister of Munitions, unless he holds a certificate from the employer by whom he was last so employed that he left work with the consent of his employer or a certificate from the munitions tribunal that the consent has been unreasonably withheld.

(2) If any workman or his trade union representative complains to a munitions tribunal in accordance with rules made with respect to those tribunals that the consent of an employer has been unreasonably withheld that tribunal may, after examining into the case, if they think fit, grant a certificate which shall, for the purposes of this section, have the same effect as a certificate from the employer.

(3) If any person gives employment in contravention of the provisions of this section, he shall be guilty of an offence under this Act.

8.—(1) The Minister of Munitions may make rules authorising the wearing of badges or other distinctive marks by persons engaged on munitions work or other work for war purposes, and as to the issue and return of any such badges or marks, and may by those rules prohibit the use, wearing or issue of any such badges or of any badges or marks indicating or suggesting that any person is engaged on munitions work or work for war purposes except as authorised by those rules.

(2) If any person acts in contravention of, or fails to comply with any such rules, he shall be guilty of an offence against this Act.

9. This Part of this Act shall apply to any docks used by the Admiralty for any purposes connected with the war as it applies to establishments in which munitions work is carried on, with the substitution in relation to any such docks or persons employed in any such docks of the Admiralty for the Minister of Munitions.

PART III.

10. The following paragraph shall be substituted for paragraph (*d*) set out in subsection (1) of section one of the Defence of the Realm (Amendment) No. 2 Act, 1915, and shall be deemed to have been contained in that Act, namely :—

(*d*) to regulate or restrict the carrying on of any work in any factory, workshop, or other premises, or the engagement or employment of any workman or all or any classes of workmen therein, or to remove the plant therefrom with a view to maintaining or increasing the production of munitions in other factories, workshops, or premises, or to regulate and control the supply of metals and material that may be required for any articles for use in war.

11.—(1) The owner of any establishment in which persons are employed shall, if so required by the Minister of Munitions, give to the Minister such information, in such form and in such manner, as the Minister may require as to

(*a*) the numbers and classes of persons employed or likely to be employed in the establishment from time to time ;

(*b*) the numbers and classes of machines at any such establishment ;

(*c*) the nature of the work on which any such persons are employed, or any such machines are engaged, from time to time ;

(*d*) any other matters with respect to which the Minister may desire information for the purpose of his powers and duties ;

and the Minister may arrange with any other Government department for the collection of any such information.

(2) If the owner of any establishment fails to comply with this section he shall be guilty of an offence under this Act.

12. If any employer, or the owner of any establishment or any workman, for the purpose of evading any provision of this Act, makes any false statement or representation, or gives any false certificate, or furnishes any false information, he shall be guilty of an offence under this Act.

13. There shall be paid out of moneys provided by Parliament to any person being a member of an arbitration tribunal, munitions tribunal, or board of referees under this Act, or being a referee under this Act, and to any other officers required in connexion with any such tribunal or board, such remuneration and travelling or other expenses (including compensation for loss of time) as the Minister of Munitions or Board of Trade, as the case may be, with the sanction of the Treasury may determine.

14.—(1) Any person guilty of an offence under this Act—

(*a*) shall, if the offence is a contravention of or failure to comply with an award, be liable to a fine not exceeding five pounds for each day or part of a day during which the contravention or failure to comply continues, and, if the person guilty of the offence is an employer, for each man in respect of whom the contravention or failure takes place; and

(*b*) shall, if the offence is a contravention of the provisions of this Act with respect to the prevention of lock-outs, be liable to a fine not exceeding five pounds, in respect of each man locked out, for each day or part of a day during which the contravention continues; and

(*c*) shall, if the offence is a contravention of the provisions of this Act with respect to the prohibition of strikes, be liable to a fine not exceeding five pounds for each day or part of a day during which the contravention continues; and

(*d*) shall, if the offence is a contravention of or failure to comply with any regulations in a controlled establishment or any undertaking given by a workman under Part II. of this Act, be liable in respect of each offence to a fine not exceeding three pounds; and

(*e*) shall, if the offence is a contravention of or failure to comply with any other provisions of this Act, be liable in respect of each offence to a fine not exceeding fifty pounds.

(2) A fine for any offence, under this Act, shall be recoverable only before the munitions tribunal established for the purpose under this Act.

15.—(1) The munitions tribunal shall be a person, appointed for the purpose by the Ministry of Munitions, sitting with two or some other even number of assessors, one half being chosen by the Minister of Munitions from a panel constituted by the Minister of Munitions of persons representing employers and the other half being so chosen from a panel constituted by the Minister of Munitions of persons representing workmen and the Minister of Munitions may constitute two classes of munitions tribunals, the first class having jurisdiction to deal with all offences and matters under this Act, the second class having jurisdiction, so far as offences are concerned, to deal only with any contravention of, or failure to comply with, any regulation made applicable to a controlled establishment or any undertaking given by a workman under Part II. of this Act.

The Admiralty shall be substituted for the Minister of Munitions under this provision as the authority to appoint and choose members of a munitions tribunal to deal with offences by persons employed in any docks declared to be controlled establishments by the Admiralty.

(2) The Minister of Munitions or the Admiralty shall constitute munitions tribunals as and when occasion requires.

(3) Rules may be made for regulating the munitions tribunals or either class of munitions tribunals so far as relates to offences under this Act by a Secretary of State, and so far as relates to any other matters which are referred to them under this Act by the Minister of Munitions, and rules made by the Secretary of State may apply, with the necessary modifications, any of the provisions of the Summary Jurisdiction Acts or any provisions applicable to a court of summary jurisdiction, which it appears expedient to apply, and any provisions so applied shall apply to munitions tribunals accordingly.

In the application of this provision to Scotland the Secretary for Scotland shall be substituted for the Secretary of State, and in the application of this provision to Ireland the Lord Lieutenant shall be substituted for the Secretary of State.

(4) A person employed or workman shall not be imprisoned in respect of the non-payment of a fine imposed by a munitions tribunal for an offence within the jurisdiction of a tribunal of the second class, but that tribunal may, without prejudice to any other available means of recovery, make an order requiring such deductions to be made on account of the fine from the wages of the person employed or workman as the tribunal think fit, and requiring the person by whom the wages are paid to account for any sums deducted in accordance with the order.

16. Any company, association, or body of persons shall have power, notwithstanding anything contained in any Act, order, or instrument by or under which it is constituted or regulated, to carry on munitions work during the present war.

17. Any rule made under this Act shall be laid before each House of Parliament forthwith, and, if an Address is presented to His Majesty by either House of Parliament within the next subsequent twenty-one days on which that House has sat next after any such rule is laid before it praying that the rule may be annulled, His Majesty in Council may annul the rule and it shall thenceforth be void, but without prejudice to the validity of anything previously done thereunder.

18. The Documentary Evidence Act, 1868, as amended by the Documentary Evidence Act, 1882, shall apply to the Minister of Munitions in like manner as if that Minister were mentioned in the first column of the Schedule to the first-mentioned Act, and as if that Minister, or a secretary in the Ministry or any person authorised by the Minister to act on his behalf, were mentioned in the second column of that Schedule, and as if the regulations referred to in those Acts included any document issued by the Minister.

19. In this Act, unless the context otherwise requires,—

(*a*) The expression "lock-out" means the closing of a place of employment, or the suspension of work, or the refusal by an employer to continue to employ any number of persons employed by him in consequence of a dispute, done with a view to compelling those persons, or to aid another employer in compelling persons employed by him, to accept terms or conditions of or affecting employment :

(*b*) The expression "strike" means the cessation of work by a body of persons employed acting in combination, or a concerted refusal or a refusal under a common understanding of any number of persons employed to continue to work for an employer in consequence of a dispute, done as a means of compelling their employer or any person or body of persons employed, or to aid other workmen in compelling their employer or any person or body of persons employed, to accept or not to accept terms or conditions of or affecting employment.

20.—(1) This Act may be cited as the Munitions of War Act, 1915.

(2) This Act shall have effect only so long as the office of Minister of Munitions and the Ministry of Munitions exist:

Provided that Part I. of this Act shall continue to apply for a period of twelve months after the conclusion of the present war to any difference arising in relation to the performance by the owner of any establishment of his undertaking to carry out the provisions set out in the Second Schedule to this Act notwithstanding that the office of Minister of Munitions and the Ministry of Munitions have ceased to exist.

SCHEDULES.

Schedule I.

1. Any difference, matter or question to be referred for settlement in accordance with the provisions of this Schedule shall be referred to one of the three following arbitration tribunals:—

(*a*) The Committee appointed by the First Lord of the Treasury known as the Committee on Production; or

(*b*) A single arbitrator to be agreed upon by the parties or in default of agreement appointed by the Board of Trade; or

(*c*) A court of arbitration consisting of an equal number of persons representing employers and persons representing workmen with a chairman appointed by the Board of Trade.

2. The tribunal to which the reference is made shall be determined by agreement between the parties to the difference or in default of such agreement by the Board of Trade.

3. The Arbitration Act, 1889, shall not apply to any reference under the provisions of this Schedule.

Schedule II.

1. Any departure during the war from the practice ruling in the workshops, shipyards, and other industries prior to the war, shall only be for the period of the war.

2. No change in practice made during the war shall be allowed to prejudice the position of the workmen in the owners' employment, or of their trade unions in regard to the resumption and maintenance after the war of any rules or customs existing prior to the war.

3. In any readjustment of staff which may have to be effected after the war priority of employment will be given to workmen in the owners' employment at the beginning of the war who have been serving with the colours or who were in the owners' employment when the establishment became a controlled establishment.

4. Where the custom of a shop is changed during the war by the introduction of semi-skilled men to perform work hitherto performed by a class of workmen of higher skill, the time and piece rates paid shall be the usual rates of the district for that class of work.

5. The relaxation of existing demarcation restrictions or admission of semi-skilled or female labour shall not affect adversely the rates customarily paid for the job. In cases where men who ordinarily do the work are adversely affected thereby, the necessary readjustments shall be made so that they can maintain their previous earnings.

6. A record of the nature of the departure from the conditions prevailing when the establishment became a controlled establishment shall be kept, and shall be open for inspection by the authorised representative of the Government.

7. Due notice shall be given to the workmen concerned wherever practicable of any changes of working conditions which it is desired to introduce as the result of the establishment becoming a controlled establishment, and opportunity for local consultation with workmen or their representatives shall be given if desired.

8. All differences with workmen engaged on Government work arising out of changes so introduced or with regard to wages or conditions of employment arising out of the war shall be settled in accordance with this Act without stoppage of work.

9. Nothing in this Schedule (except as provided by the fourth[1] paragraph thereof) shall prejudice the position of employers or persons employed after the war.

---

[1] "Fourth," a drafting error for "third," corrected by the Amending Act, 1916, Section 19.

APPENDIX II.

Memorandum by the National Advisory Committee.

ACCELERATION OF SUPPLY OF MUNITIONS.

The Organisation of Labour.

The serious position of the British Army in Flanders and of Russia in consequence of an inadequate supply of munitions—especially shells and fuses—was the subject of an interview between the Minister of Munitions (Mr. Lloyd George) and the National Advisory Committee on Tuesday, 8 June.

The statements made by Mr. Lloyd George clearly indicated a situation that was both grave and menacing, and demonstrated the essential importance of bringing home to the skilled and organised workers not only its extreme gravity and danger, but also its supreme urgency.

The extent of the nation's requirements, which Parliament has charged the Minister of Munitions with supplying with all possible speed, is such as to demand that the entire organising capacity of the nation be concentrated upon it.

In this effort, which may mean the saving of the nation, organised labour can and must take an essential and indispensable part, for with enthusiasm and unselfishness it can render invaluable service in a great national crisis.

If the world of industry is to be changed and adapted to meet the clamant and paramount need of the hour, it must be obvious that something more is required than the transfer of a few men here and there. It means that all our available resources of skilled, semi-skilled, and unskilled labour (male and female) must be utilised.

To enable this to be done speedily and efficiently there are two points that must be considered, both of primary and essential importance :—

1. The responsibility of the Trade Unions to the country for so increasing, by their assistance, the production of munitions of war as to place the issue of the war beyond all doubt or uncertainty.

2. The responsibility of the Government to the Trade Unions and the workers generally for preventing their established position from being prejudiced, and in safeguarding their social and economic interests by eliminating the element of excessive profits or exorbitant prices of the necessities of life.

The Trade Unions have the best machinery of registration, especially as concerns the skilled trades immediately concerned with the output of munitions. This machinery, worked in conjunction with the Returns made voluntarily by employers to the Board of Trade, which if thought desirable could be made universal, could with the

least possible delay place the Minister of Munitions in possession of the best information as to the resources available for his purpose.

Regard must be had to the extreme urgency of the problem, and the small amount of unemployed labour available either at home or in the oversea dominions.

We cannot afford the time that would be unavoidably occupied were the Government to embark upon a scheme for the national registration of the names, addresses, age, and occupation of all workers, who might be called upon for some form of service in the making of munitions of war. It must also be recognised that, as time is so important an element, the training of semi- or unskilled workers cannot be accomplished on any extensive scale.

We are forced, therefore, to consider whether the available resources can be efficiently and effectively applied so as to increase the production of munitions to meet the demands of our own country and any of the Allies without having to resort to any form of compulsion, even as a temporary expedient. The application of any form of compulsion to workmen concerned in the manufacture of munitions of war, except as a last and unavoidable resource, would be so disturbing as to defeat the object in view.

In order that a voluntary system of transfer of workmen from one shop or locality to another be given the fullest possible trial, we request :—

1. That the Minister shall state the kind of munitions required, the areas in which their manufacture can be most readily carried on, and the class and number of men necessary.

2. That in these areas the workmen required, and who are at present engaged on non-Government work, be invited to volunteer for service with such firms as are or may be engaged in the manufacture of war munitions, under Government control, and whose profits will consequently be restricted.

3. That a list of volunteer workmen shall be submitted to their present employers, and to the Trade Unions representing each particular trade, who shall report to the Local Munitions Committee as to the suitability of the workman for the particular class of work which it is designed he shall be called upon to do.

4. That the lists of volunteer workmen shall be closed within seven days of the issue of the invitation, and a completed list, when vouched, shall be lodged with the Local War Munitions Committee, who shall immediately report to the Ministry of Munitions.

Any transference of labour shall receive consideration in respect of fares and subsistence allowances in accordance with the following conditions[1] :—

1. No workman shall suffer pecuniarily by being transferred to armament work, and no attempt shall be made by or on behalf of

[1] Note.—The rules for labour transference are those which were drawn up by the North East Coast Armaments Committee and approved by the Munitions of War Committee on 12 May, 1915. (See Vol. I., Part III., App. XIV.).

workmen to derive any actual profit from the country's critical position, and the Government's undertaking to pay subsistence allowance, train fares, and travelling expenses as stated below. Subsistence and travelling allowances will only be paid to men already in employment who cannot be otherwise obtained, and who are transferred to British Government work at the request of the Local Munitions Committee.

2. Subsistence allowance, *i.e.*, lodging allowance at the rate of 2s. 6d. a day for seven days per week, will be paid to men brought from a distance beyond that which they can reasonably travel daily, so long as they are in the employment of the firm to which they are transferred. Railway fare will be paid to the men transferred from a distance at the commencement and completion of the work for which they were transferred.

3. When the man is within daily travelling distance, *e.g.*, Sunderland to Newcastle, the man shall receive the value of workmen's tickets and one hour's travelling time per day, at the rate of time and a half, but he should start work at 6 a.m., finishing at 5 p.m. If on night shift, he shall start work at 5 p.m. and work until 6 a.m. The Armaments Committee shall take steps where necessary to secure suitable train or tram service.

4. If, however, a man be living at Newcastle and be working at Wallsend, and he is transferred to a works at Newcastle, such man shall only receive his travelling expenses, *e.g.*, tram fare from Byket or Heaton to Elswick or Scotswood, and similar cases will be considered on their merits.

5. Lodging money shall be paid by the firm employing the man to the man with his weekly wages.

6. The Armaments Committee shall issue a warrant to the firm for each man, stating the nature of the allowance he is to receive and the amount. This warrant to be numbered, and the firm to make a detailed monthly statement to the Committee of the men transferred and the amount due to them. The Committee shall then verify and forward this to the Government for payment.

7. Men seeking employment in the ordinary way will receive the usual district rates, but are not entitled to subsistence allowance.

8. Should the Committee find that men have been paid off by an employer with the object of having them transferred to another locality without receiving the authorised allowances, then the Armaments Committee shall reserve to themselves the right of deciding such a case on its merits.

9. The Armaments Committee shall undertake that every workman transferred shall receive the same rate, at least, as in his previous employment.

10. All men who are moved will be provided with the certificate or warrant stating the name of the employer they are leaving and the name of the employer to whom they are going. This warrant to be issued in triplicate, one for the late employer, one for the new employer, and one for the man himself. The Armaments Committee will issue it.

11. The release is to be for a period not exceeding three months in the first instance, but may be renewed by the Armaments Committee if required, subject to the approval of the Government.

The Trade Unions assure the Government that any of their members selected by any Local Armaments Committee for war work shall be immediately placed at the disposal of the Government on the rates of wages and allowances decided upon by the Local Armaments Committee. Such selected men shall continue to work at the factory or yard appointed by the Government, and shall not change their employment without the consent of the Committee. Workmen refusing to abide by these conditions shall be dealt with on lines agreed to by the Local Armaments Committee.

In view of a continued shortage of men, skilled workmen who are at present serving with the colours may be drafted back to the workshop and less skilled and female labour shall be used on minor operations connected with munitions production in accordance with the Treasury Agreement, the whole of the provisions of which must be carefully observed.

The National Advisory Committee rely upon the Government realising their responsibility, referred to previously, for preventing the established position of the workmen from being prejudiced and for safeguarding their social and economic interests by eliminating the element of excessive profits or exorbitant prices of the necessities of life. The Committee also rely upon the whole of the organised machinery of the Trade Unions being placed at the disposal of the Government in their endeavour vastly to increase the output of war munitions, and the Committee appeal with confidence to the organised workers to assist to the utmost extent of their powers to this end. The National Advisory Committee, in conjunction with the Local Advisory Committees, will be prepared to co-operate in this work in every way open to them, either by the distribution of literature or addressing public meetings.

ARTHUR HENDERSON (*Chairman*).
J. T. BROWNLIE.
JOHN HILL.
FRANK SMITH.
ALEX. WILKIE.
C. W. BOWERMAN.
WM. MOSSES (*Secretary*).

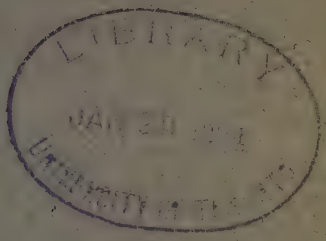
10 *June*, 1915.

INDEX.

CONTENTS OF VOLUME I.

NOTE.—The present issue is subject to revision, and must be regarded as provisional.

HISTORY OF THE MINISTRY OF MUNITIONS



VOLUME II

GENERAL ORGANISATION FOR MUNITIONS SUPPLY

PART I

ADMINISTRATIVE POLICY AND ORGANISATION

1921

VOLUME II

GENERAL ORGANISATION FOR MUNITIONS SUPPLY

PART I

ADMINISTRATIVE POLICY AND ORGANISATION

CONTENTS.

(4271) Wt. 16382/X3845 250 9/21 Harrow G.36

CHAPTER III.

Departmental Development under Mr. E. S. Montagu and Dr. C. Addison.

CHAPTER IV.

Mr. Churchill's Administration—Co-ordinated Effort.

CHAPTER V.

Growth and Structure of the Department.

CHAPTER VI.

The Problem of Central Control.

CHAPTER VI—*cont.*

CHAPTER VII.

The Powers and Responsibilities of the Minister of Munitions.

APPENDICES.

CHAPTER I.

THE OFFICE OF MINISTER OF MUNITIONS.

Rt. Hon. D. Lloyd George, M.P.

On 26 May, 1915, the names of the first Coalition Cabinet were published and the following announcement appeared in the Press :—

> " The Prime Minister has decided that a new Department shall be created, to be called the Ministry of Munitions, charged with organising the supply of munitions of war. Mr. Lloyd George has undertaken the formation and temporary direction of this Department, and during his tenure of office as Minister of Munitions will vacate the office of Chancellor of the Exchequer."

Mr. Lloyd George was formally appointed Minister of Munitions by Royal Warrant on 9 June, the day on which the Ministry of Munitions Act became law. He had already at the date of the public announcement established himself at Whitehall Gardens, where he was joined by Dr. Addison and a small secretariat which had been assisting in the work of the Munitions of War Committee.

Rt. Hon. E. S. Montagu, M.P.

After the death of Lord Kitchener, Mr. Lloyd George became Secretary of State for War, and was succeeded at the Ministry of Munitions on 12 July, 1916, by Mr. E. S. Montagu, M.P., who had held the position of Financial Secretary to the Treasury. He now entered the Cabinet, and by virtue of his office became a member of the War Committee of the Cabinet. When Mr. Lloyd George became Prime Minister on 9 December, 1916, and the War Cabinet was constituted, Mr. Montagu undertook the office of Vice-Chairman of the Committee of the Cabinet on Reconstruction.

Rt. Hon. Dr. C. Addison, M.P.

Dr. C. Addison, who succeeded Mr. Montagu as Minister of Munitions in December, 1916, had acted as Parliamentary Secretary to the Ministry since its foundation. He held this office until July, 1917, when he was appointed to take charge of the newly formed Ministry of Reconstruction.

Rt. Hon. W. S. Churchill, M.P.

Mr. Winston Churchill, the fourth Minister of Munitions, had held the office of First Lord of the Admiralty on the outbreak of the war. At the end of May, 1915, when the Cabinet was reconstructed and the

Coalition Government was formed, he became Chancellor of the Duchy of Lancaster, but on 13 November he resigned his office, and during 1916 was on active service in France. On 20 July, 1917, he was appointed Minister of Munitions and held this office until January, 1919, when he succeeded Lord Milner as Secretary of State for War.

Rt. Hon. Lord Inverforth.

Lord Inverforth, then Mr. Andrew Weir, senior partner of the shipping firm of Messrs. Andrew Weir and Company, had been appointed Surveyor-General of Supply at the War Office in April, 1917. At the beginning of 1919 he was granted a Peerage, and on 14 January, 1919, became Minister of Munitions, which office he held until the Ministry ceased to exist at the end of March, 1921. He served as Chairman of the Disposal and Liquidation Commission until his resignation on 31 May, 1921.

The Act creating the office of Minister of Munitions "for the purpose of supplying munitions for the present war" laid it down that the existence of the Department and its official head should terminate "twelve months after the conclusion of the present war or such earlier date as may be fixed by His Majesty in Council." Its actual official end took place on 31 March, 1921, five months in advance of the date fixed as the end of the war for statutory purposes.

The chapters which immediately follow trace the administrative development of the Ministry of Munitions in outline from its establishment in 1915 to the close of the year 1918. The activities of the Department subsequent to this date, more particularly the liquidation of the Ministry's organisation and commitments and the work of the Surplus Government Property Disposal Board, are reserved for review in a supplementary chapter.

CHAPTER II.

THE ESTABLISHMENT OF THE MINISTRY OF MUNITIONS UNDER MR. LLOYD GEORGE.

I. Mr. Lloyd George's War Policy.

Mr. Lloyd George had realised earlier than most people that it was " an engineers' war," and that it was going to be fought in the workshops of France and Great Britain as well as on the battlefields of Belgium and Poland.[1] He was Chancellor of the Exchequer when war broke out and was able, in that position, to do much to further the national effort and remove financial restrictions which hampered industrial developments. A beginning was made by the Treasury Minute of 20 August, 1914, to relax the normal procedure governing expenditure by the War Department.[2] In September the Treasury ear-marked a substantial sum from the Vote of Credit as a fund from which advances could be made to contractors, whose power to produce munitions in the quantities required was limited by the heavy outlay for plant and extensions which had to be faced. Full advantage was taken of this provision in the succeeding months, when it became necessary to bring pressure to bear upon all the principal armament manufacturers to undertake reduplications of their already extended programmes, and almost every important contract contained an agreement as to an advance of capital. Since such advances were only recoverable by taking deliveries under the contract, the effect was that the risk of loss consequent upon a sudden and early termination of the war was to that extent transferred to the Exchequer :

> " I ventured, on behalf of the Treasury," said Mr. Lloyd George at a later date, " to give a guarantee that whatever capital expenditure was necessary in order to increase the capacity of output, we would see them indemnified against loss. The result has been that they have taken very full advantage of that, and incurred capital expenditure on the strength of that guarantee, which up to that moment they were unwilling to undertake."[3]

The seriousness of the munitions situation was of course apparent as soon as the creation of the new armies was undertaken. The Cabinet were fully seized of the gravity of the burden thus cast upon the War Office. In order to assist Lord Kitchener, who was absorbed in the primary and essential work of raising and training the new armies, in addition to his immediate concern in the daily development

---

[1] Speech at Bangor, 28 February, 1915.

[2] *Correspondence relating to Financial Responsibility.* (Hist. Rec./R/200/2). Appendix A. See also Treasury Minute of 8 December, 1914, *ibid.*, Appendix B.

[3] *Parliamentary Debates* (1915), *H. of C.*, LXXI, 322-3.

of the anxious situation at the front, Mr. Asquith appointed a Committee to examine the munitions situation and exploit available sources of supply. This Committee met at the War Office under Lord Kitchener's chairmanship, and two of its principal members, Mr. Lloyd George and Mr. Churchill, thus acquired a first-hand knowledge of the problems which were subsequently to absorb their energies at the Ministry of Munitions. The Committee examined successively the situation in regard to guns, ammunition, and explosives, and a greatly extended programme of orders was arranged. The principal contractors were interviewed and given direct instructions, being authorised to proceed without awaiting the completion of contract formalities. A mission was sent to France to study the methods by which that country was dealing with the mobilisation of industry.

By the end of the year the policy adopted by the Cabinet Committee, on the advice of the experts, of developing the resources of existing firms with armament experience had been given its full application. The limiting factor was now the supply of skilled labour to the Arsenal and contracting firms, and this problem was remitted by the Cabinet Committee to the Board of Trade.

Mr. Lloyd George consistently advocated the maximum extension of these preparatory measures, and his initiative had an important influence in stimulating the War Office efforts to place additional orders in Britain, in Canada, and in the United States of America. Nor did he lose sight of the problem after the close of 1914, when the Cabinet Committee no longer met as a body.

A memorandum[1] which Mr. Lloyd George laid before his colleagues in February, 1915, was of the first importance as the origin of a new departure in munitions policy. He pointed out that the preparations that were being made to supply munitions were wholly inadequate, and that the number of men who could be put into the field was seriously limited by the number of guns and rifles that could be supplied. Great Britain had not done anything like what she could do to increase her war equipment, and he believed that the effective energies of the country could be doubled if her factories were thoroughly organised. Instead of assuming that the war would be over in the autumn, it should be assumed that it would last through 1916. All the engineering works of the country ought to be turned on to the production of war material, and new machinery for producing guns and rifles in the following year must be laid down. Legislation which would enable the Government to commandeer works and deal with labour difficulties and shortcomings was desirable, and power might even be taken to close public-houses in areas where munitions were being manufactured. It would be a disaster to face another year of war with inadequate preparation.

During the succeeding months the mobilisation of the national resources for the production of munitions of war was Mr. Lloyd George's chief preoccupation. He played a considerable part in the discussions which preceded the introduction of the Defence of the Realm Amend-

[1] HIST. REC. /R/170/23.

ment (No. 2) Act, under which the Government took power to take over non-munition factories and to require their owners to use them for the production of war material as directed by the Admiralty or Army Council. In his speech on the introduction of that Bill (9 March), which was his first public connection with the munitions campaign, he stated that the duration of the war and the success of the war depended on the output of munitions, and foreshadowed the development of local organisation for munitions production, in full consultation with manufacturers, controlled by a central committee with a business man at the head of it.[1] Speaking on the following day (10 March), he said that increased production of munitions was "a matter of life and death to this country. . . . All those who know the military position know how much depends upon getting an adequate supply, and, if necessary, an overwhelming supply of the necessary explosives at the critical moment."[2]

This speech stimulated manufacturers to offer their buildings and plant to the Government for the production of munitions, and gave an impetus to the formation of local committees to organise production, on the lines of the co-operative group at Leicester, which was already in existence.[3] At the same time the War Office and Board of Trade were arranging exhibitions of shells and fuses in Liverpool, Manchester, Glasgow, Leeds, Coventry, Sheffield, Birmingham, and London;[4] and the movement for organising munitions production locally gathered force rapidly.

The vital necessity of enlisting the support of labour was not overlooked, and at the Treasury Conference[5] with the representatives of Trade Unions on 19 March Mr. Lloyd George shaped the terms of a voluntary agreement with labour which was ultimately given legal sanction in the Munitions of War Act—the suspension, for the duration of the war, of all trade union restrictions which limited output in return for the limitation of employers' profits.

A little later (8 April) Mr. Lloyd George became chairman of a new committee, the Munitions of War Committee, appointed by the Prime Minister "to ensure the promptest and most efficient application of all the available productive resources of the country to the manufacture and supply of munitions of war for the Navy and Army." This committee shaped what might be called the munitions policy of the country, working through the Armaments Output Committee, which had been appointed a week earlier by Lord Kitchener, with the view of improving the supply of labour available for munitions production. The latter committee gained authority and prestige from the former, and during the months that followed it made considerable progress in the task of organising munitions supply throughout the country. Its principal task was to carry out the new policy of spreading contracts which had now superseded that of reliance

[1] *Parliamentary Debates* (1915), *H. of C.*, LXX, 1277.
[2] *Ibid.*, 1461. See Vol. I, Part III, p. 20.
[3] See Vol. I, Part III, pp. 13–15.
[4] *Ibid.*, p. 9.
[5] For a full account of the Treasury Conference see Vol I, Part II.

upon the armament firms. Local armament committees, on which representatives of Government Departments sat with representatives of the employers and of the trade unions, were set up at Newcastle and Glasgow, and in many other districts munitions committees were encouraged to develop munitions production on a co-operative basis, the work involved being distributed among engineering firms in the district.

Impetus was given to the movement by the publication on 15 April of a despatch from Sir John French, stating that "an almost unlimited supply of ammunition was necessary,"[1] and by the end of April the establishment of National Factories which were to produce shell at the expense of the State, eliminating private profit, had been decided upon. In his speech on 21 April, Mr. Lloyd George summarised the new policy.[2] Success in the war was a question of ammunition, and since it was clear that no process of sub-contracting under, or transfer of labour to, the armament firms would suffice to meet the demands of the army, it was therefore necessary to take the risk of organising munitions production by firms who had not hitherto been employed for that purpose.[3] The armament firms were helping with skilled advice and were training labour for the new factories, and the organisation of the whole engineering industry in this way promised a great increase in munitions production.

Mr. Lloyd George had already made some outspoken and much criticised speeches on the delays due to excessive drinking on the part of a section of the men employed in the engineering trade, and on 29 April he introduced the Defence of the Realm (Amendment No. 3) Act,[4] under which powers were taken to close public-houses and restrict hours in certain munitions areas, such powers being exercised through a Central Board. The working out of this experiment, which was undertaken with "one object and one only in view, to increase the output of munitions," will be considered in detail elsewhere.

Meanwhile, the situation at the front was very serious. The shortage of ammunition, especially of high explosive ammunition, entailed drastic rationing of guns, and the army had to stand up to the terrific weight of the German bombardments without being able to make an effective reply. A gas attack on 22 April showed that the enemy had a new and formidable weapon, and in the second Battle of Ypres the superior weight and number of the enemy's guns inflicted enormous losses and compelled a slight withdrawal of the British line.

On the other hand, the German lines seemed impregnable. The first position consisted of several lines of very deep trenches with strong redoubts at intervals, and with dug-outs and bomb-proof shelters sometimes as much as 40 ft. below the surface. Second and third lines fortified like the first lay to the rear, and the labyrinths

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXI, 302.
[2] See Vol. I, Part III, p. 70.
[3] *Parliamentary Debates* (1915), *H. of C.*, LXXI, 318, 319.
[4] *Ibid.*, 864 ff.

of trenches were further defended by concreted machine gun stations and forests of barbed wire entanglements. The German lines, in fact, were a series of fortresses which could only be attacked by the methods and with the weapons of siege warfare; and an infantry assault without a preliminary and sustained bombardment with artillery as heavy as that used in previous wars for regular siege operations was a vain sacrifice of life and effort.

Considerable orders for artillery and ammunition of all kinds were placed as a result of Cabinet decisions in October, 1914,[1] not only in Great Britain, but also in Canada and America,[2] but it was, of course, impossible to obtain rapidly an effective output of a type of shell to which manufacturers were unaccustomed.[3] Large orders for high explosive shell were placed in America in the spring of 1915, but deliveries were at first disappointing.

On 14 May, the dominating factor of the situation, at the moment, was revealed to the British public by Colonel Repington's article in the *Times*.

> "We had not sufficient high explosive to level the enemy's parapets to the ground, after the French practice. The infantry did splendidly, but the conditions were too hard. The want of an unlimited supply of high explosive was a fatal bar to our success."

The result of this revelation, in conjunction with the Russian disasters in Galicia and East Prussia and the check in the Dardanelles, was that the pending reconstruction of the Government "on a broader personal and political basis for the purposes of the war alone," was announced by Mr. Asquith on 19 May. A week later it was announced that a Ministry of Munitions was to be set up, with Mr. Lloyd George as its first Minister, the Act creating it receiving the royal assent on 9 June.

II. The Appeal to the Workshop.

During the first week in June Mr. Lloyd George made a tour of the districts which were the centres of the engineering industry, in order to harness local enthusiasm for munitions production to the service of the new Ministry. At Manchester, Liverpool, Birmingham, Cardiff, and Bristol, he met representatives of the chief engineering firms and urged them to organise local committees to assist in munitions production and allocate contracts, so as to make the best use of the engineering resources of the district.[4] He laid stress on the necessity for decentralisation in order to save time, and appealed to business men and trade unionists to work together to supply

---

[1] A full account of this will be given elsewhere.
[2] Hist. Rec./R/1000/10.
[3] *See* Vol. II, Parts III, IV.
[4] Hist. Rec./R/1121. 22/1, 2, 3, 4, 5, 6. *Ibid.*, 1121. 26/3. *Ibid.*, H/1121. 22/1. 6.

munitions. These appeals stimulated the growth of the local munitions committees considered in detail elsewhere, though, perhaps unfortunately, the example of Newcastle and Glasgow was not followed, and representatives of labour did not, after the beginning, save in two or three cases, sit on Boards of Management.

The most vital part of this campaign lay in his appeal to labour. His speech at Manchester, which attracted a great deal of attention, crystallised his labour policy, which was coloured throughout by his intense conviction that the war could not be won without the sacrifice of individual liberty to the needs of the State, which involved a much wider measure of State control over labour.

On the question of the relaxation of trade union practices and restrictions, Mr. Lloyd George was very outspoken. He appealed to the workmen to give up, for the period of the war, the unwritten rules by which output was limited, and gave an undertaking that piece rates should not be reduced.[1] In the same way he urged the suspension of trade union rules forbidding dilution in order that unskilled men and women might be brought in to make up for the shortage of skilled men.[2]

He laid stress on the fact that the nation had an enormous leeway to make up, that the army was suffering for the mistakes and delays of the last twelve months, and that, in spite of the vast resources of raw material which were at the disposal of the Allies, the Central Powers still had an overwhelming superiority in all the material and equipment of war.

> "We were the worst organised nation in the world for this war. . . . . It is a war of munitions. We are fighting against the best organised community in the world, the best organised either for war or peace, and we have been employing too much the haphazard, leisurely, go-as-you-please methods, which, believe me, would not have enabled us to maintain our place as a nation even in peace very much longer. The nation now needs all the machinery that is capable of being used for turning out munitions or equipment, all the skill that is available for the purpose, all the industry, all the labour, and all the strength, power and resource of everyone to the utmost. . . . . That means victory."

The German triumph in Russia was due entirely to superior equipment, overwhelming superiority of shot and shell, of the munitions and equipment of war; the victory was won not by the strategy of German generals or the greater gallantry of their troops, but by the use they had made of their skilled industry, and especially by the superior organisation of their workshops.[3]

---

[1] Speeches at Bangor, 28 February, 1915; Manchester, 3 June, 1915. See also *Parliamentary Debates* (1915), *H. of C.*, LXXII, 1198–9, LXXIII, 2362–3.

[2] Speeches at Manchester, 3 June; Liverpool, 4 June, 1915.

[3] Speech at Manchester, 3 June, 1915.

He pointed out that the refusal of unenlisted labour to submit to discipline contrasted strangely with the position of the voluntary army at the front.

> "The enlisted workman cannot choose his locality of action. He cannot say, 'I am quite prepared to fight at Neuve Chapelle, but I won't fight at Festubert, and I am not going near the place they call "Wipers."' He cannot say, 'I have been in the trenches ten hours and a half and my trade union won't allow me to work more than ten hours.'"

The regulations, the customs and the practices which might be of great service in times of peace were utterly inapplicable and out of place in the terrible urgency of war.

Elsewhere he showed that he was strongly impressed by the advantages of the French system of National Service, under which all the labour in France was at the disposal of the State.

> "Workmen can be sent either to this or that factory, according to the Minister's view as to where they can be most useful; they can be grouped and concentrated exactly as is most serviceable for producing the greatest number of machines and of munitions of war. In Italy all the masters and workmen alike were completely under the control and direction of the State during the period of the war, as completely as their comrades in the trenches."

The State as an organised democracy had a right to the services of its citizens. Every man and woman was bound to render the services that the State required of them, and which in the opinion of the State they could best render. In time of war it was every citizen's duty either to work or to fight; the Commonwealth had no room for drones. If this elementary principle were once accepted, most of the difficulties that prevented the nation from throwing its full strength into the struggle would disappear—the hardships of the voluntary system that penalised patriotic trades and favoured cowards and shirkers, the waste of highly skilled labour in the ranks of the army, and the economic extravagance of voluntary recruiting.

His attitude was still more clearly revealed by his speech on the Munitions of War Bill, in which he stated that he had warned the labour leaders that if the war munitions volunteer scheme failed and the supply of munitions labour fell short, compulsion was inevitable.[1]

Mr. Lloyd George's arguments went too far for a large section of public opinion.[2] They raised the spectre of industrial conscription, and were interpreted as an attempt "to fasten forced labour upon the working classes," and to introduce Prussianism—"the curse and blight of mankind," while the Government was warned that it would

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII, 1201. Speech on 6 June. See Vol. IV, Part I, p. 5, for an account of the war munitions volunteer scheme.

[2] *e.g.*, Mr. Snowden, *Parliamentary Debates* (1915), *H. of C.*, LXXII, 107. Mr. Pringle, *ibid.*, 103. Mr. Dillon, *ibid.*, 108. Mr. Crooks, *ibid.*, 110. Mr. Hobhouse, *ibid.*, 114. Mr. J. H. Thomas, *ibid.*, 144.

be faced by factories full of sullen workers supported by a riotous and rebellious proletariat.[1]

Since it was clear that he would fail to carry the country with him in a policy involving industrial compulsion, Mr. Lloyd George fell back upon more limited measures, and the Munitions of War Bill was introduced as an alternative means of organising the labour of the country for the production of munitions of war. He viewed it purely as an expedient adopted because the country had not accepted the other and wider view, that " a perfectly democratic State has . . the right to commandeer every resource, every power, life, limb, wealth, and everything else for the interest of the State."[2]

The Munitions of War Act (2 July, 1915), therefore, went as far as the labour leaders were prepared to go in submitting labour to the control of the State. It limited the right to strike on munitions work, it included provisions for declaring munitions works controlled, which involved the limitation of profits and the suspension, for the period of the war only, of trade union restrictions and practices, it limited the freedom of labour to leave munitions work by setting up the machinery of leaving certificates, and it made arrangements to protect munitions labour from recruitment and established munitions tribunals.[3]

The Munitions of War (Amendment) Act (27 January, 1916) made certain concessions to ensure the smoother working of the original Act, of which the most important were the amendment of the clauses relating to leaving certificates, the provision of an appeal tribunal, and the abolition of imprisonment for munitions offences.[4]

Mr. Lloyd George's speech on the Munitions of War Bill (23 June) summarises the whole position and the task which the new Ministry had to face :—

> " Ultimate victory or defeat in this war depends upon the supply of munitions which the rival countries can produce, and with which they can equip their armies in the field. That is the cardinal fact of the military situation."[5]

Germany had achieved a temporary predominance in material by accumulating great stores before the war and by mobilising the whole of her industries after the war. German superiority in material was most marked in heavy guns, high explosive shell, rifles and machine guns, which last had turned out to be probably the most formidable weapons of the war. The Germans had undoubtedly anticipated the character of the war—that it was going to be a trench war—in a way that no other Power had done, and they were fully prepared both with heavy guns and high explosives to destroy the trenches of the

[1] Memorandum by Mr. Harcourt.

[2] *Parliamentary Debates* (1915), *H. of C.*, LXXVI, 2123. See also Vol. IV, Part II, Chapter III, p. 66.

[3] For a full account of the Act, see Vol. I, Part IV.

[4] For a full account of the Amending Act, see Vol. IV, Part II, Chapter III.

[5] *Parliamentary Debates* (1915), *H. of C.* LXXII, 1184–6.

enemy, and with machine guns to defend their own. On the Allied side much time had been lost owing to the obsession that trench warfare was purely a temporary phase. The professional mind was essentially a very conservative mind, and there were competent soldiers who still assumed that trench warfare would not last long and that the old conditions would return.

All this had delayed the Allies, but Mr. Lloyd George was convinced that the German and Austrian output of munitions could not only be equalled but surpassed, if the nation was in earnest and began to organise victory instead of taking it for granted.

Germany and Austria were turning out 250,000 shells per day, very nearly 8,000,000 per month, but the Central Powers had probably attained something like the limit of their possible output, while the Allies had only just crossed the threshold of their possibilities.

France had accomplished great things in spite of the fact that her most important industrial provinces and 70 per cent. of her steel production were in the hands of the enemy. Compared with Great Britain, France had certain advantages—she had more complete command over her labour ; her arsenals at the outbreak of war corresponded to the magnitude of her standing army ; she had a large trade with other countries in the production of the equipment of war, and she had not the same large navy to draw upon the engineering resources of the country. But after taking all these things into account, the surplus of engineering resources available for the material of war was undoubtedly greater in England than in France, which was an agricultural and pastoral rather than a great industrial country.

III. The Responsibility of the Minister of Munitions.

(*a*) Personal Initiative.

Mr. Lloyd George was empowered to accept full responsibility for the supply of munitions to the army. The circumstances of his appointment and the failure of the supplies arranged by the War Office to meet the needs of the army gave him a special position.[1] Feeling in Parliament had been very strong on this point, and members pressed that the new department should be allowed to establish direct communications with the army in the field,[2] and even that it should be "wholly independent of the War Office, Lord Kitchener, and everybody else,"[3] and should have the widest possible powers.[4]

The powers given to the Minister in clause 7 of the Munitions of War Act and the liberal definition of the term "munitions of war" went some way towards meeting this point of view. When the supply functions of the War Office were transferred to the Ministry it was laid down that the duties of the new department would begin when the requirements of the War Office had been made known to it, and

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII, 99–101.
[2] *Ibid.*, 1213 (Captain Guest).
[3] *Ibid.*, 1262 (Sir A. Markham).
[4] *Ibid.*, 212 (Mr. G. Lambert).

that the new department should be guided by the "general requirements and specific requisitions" of the Army Council.[1]

But the Order in Council defining the functions of the Minister of Munitions was even more explicit. It was to be his duty

> "to ensure such supply of munitions for the present war as may be required by the Army Council or the Admiralty, or may otherwise be found to be necessary."[2]

And this final clause, which met the point made so strongly in Parliament—that Mr. Lloyd George was not merely the head of a Supply Department charged with the duty of meeting War Office requirements—was emphasised by Mr. Lloyd George's declaration in the House that he would acquaint himself with the necessities of the Army and that he felt his responsibility.

This wide view of his position and responsibilities is reflected throughout his career as Minister of Munitions, and his vision of the character and probable length of the conflict that lay ahead not only had a profound effect on the munitions programmes actually adopted in his period, but enabled the Ministry to meet much larger programmes later on. He laid the foundations of the Ministry's productive capacity on a scale so vast that it was almost sufficient—as far as guns, gun ammunition, rifles, machine guns, and trench warfare supplies were concerned—to carry the country to the end of the war. The great developments undertaken under his successors were principally directed to meet new demands for aircraft, for chemical warfare, and for increased quantities of steel for shipbuilding, motor transport, tanks and railways.

In his first months of office Mr. Lloyd George made plans not only to satisfy all the demands of the Army that were known to him, but to arrange for the production of certain munitions (*e.g.*, heavy guns, machine guns, and trench warfare supplies) in excess of War Office requirements, anticipating an increased demand later on.[3]

The most striking feature in which his policy contrasted with the policy of the War Office was in the length of his vision. During the first year of the war the War Office was absorbed in the task of discovering sources of supply which would mitigate the immediate shortage, and for this reason was less willing to place American orders on which deliveries would not be obtained until 1916.[4] But Mr. Lloyd George gave orders spreading over two years, and was prepared —as in the case of big guns—to order in excess even of the maximum programme laid down by the War Office, if by that means he could induce contractors to undertake extensions which would give earlier deliveries.

---

[1] M.W./1374 and 1374/2.
[2] 16 June. Copy in M.W./1374/3.
[3] See Vol. X, Part I.
[4] See Vol. II, Part III.

As he was convinced that the war would be a long and exhausting one, he regarded capacity for future production as even more important than immediate output,[1] and this led him to supplement the existing shell factories by the erection of huge new factories which, on the most optimistic calculations, would not reach their full output until the end of 1916.

Again and again in his speeches he had insisted on the need for taking long views. In the autumn of 1914 he warned the people that they were fighting a very tough enemy who would probably fight on till he was exhausted.[2] In February, 1915, he insisted that the war would last long and that victory would not be secured without a prolonged struggle ;[3] in July he stated that the situation was serious if not perilous.

> "Nothing I can possibly say will do more to convince the people of this country of the danger than the facts that appear from day to day in the papers—not the headlines ; please pass those over. Read the news. The men who after doing that do not understand the peril of their country would not believe it though one rose from the dead to tell them."[4]

In December he was facing the possibility of a protracted war and urging the House of Commons to "cast aside the fond illusion that you can win victory by an elaborate pretence that you are doing so" and to throw the whole energies of the country into the struggle.[5] Later on he warned the people not to underestimate the strength of the enemy,[6] and emphasised the fact that the military situation was an anxious one and that victory was still a long way off.[7]

This conviction coloured the main lines of Mr. Lloyd George's policy—his insistence on the maximum munitions programmes, his anxiety for the introduction of compulsory military service, for greater control of capital and labour by the State, and his advocacy of national economy and of the fullest co-operation with the Allies.

(*b*) Financial Responsibility.

Mr. Lloyd George was convinced that since ultimate victory or defeat in the war depended on the supply of munitions, it was impossible to place any financial limit on munitions programmes.[8]

As far as Treasury control was concerned, the War Department and the Admiralty had been virtually emancipated for the period of the war from the necessity of obtaining Treasury sanction as a

---

[1] Speech at Conway, 6 May, 1916.
[2] Speech at the Treasury, 8 September, 1914; at Queen's Hall, 19 September, 1914; in the House of Commons, 17 November, 1914, *Parliamentary Debates* (1914), *H. of C.*, LXVIII, 353.
[3] Speech at Bangor, 28 February, 1915.
[4] Speech to miners' representatives, 28 July, 1915.
[5] *Parliamentary Debates* (1915), *H. of C.*, LXXVII, 122.
[6] Speech at Conway, 6 May, 1916.
[7] 23 February, 1917.
[8] *Parliamentary Debates* (1915), *H. of C.*, LXXII, 1184.

preliminary to expenditure "vitally necessary in the public interest," except with regard to expenditure on land and buildings and with reference to minor questions like staff and salaries, where delay would not be prejudicial to public interests.[1] Contracts for munitions involving capital advances, which in normal times would have required Treasury sanction, were also exempted, for reasons given by Mr. Lloyd George, then Chancellor of the Exchequer, as follows :—

> "In dealing with the contractors for these vitally necessary supplies, rapidity in the conclusion of agreements is of paramount necessity. . . . The first interest of the taxpayer is that the supplies should be secured. With this object it may be to the public advantage to conclude contracts in the negotiation of which the prime necessity of securing expeditious and satisfactory delivery has been regarded as of more urgent importance than the actual terms of the bargain."[2]

The same freedom was extended to the new Ministry, when, in September, 1915, it took over from the War Office financial responsibility for munitions expenditure.[3] It was provided that purchases of land or leases of land for more than seven years would require Treasury sanction, and that Treasury sanction must also be obtained for expenditure on factories and other buildings, "the responsibility for the distribution of expenditure as between individual undertakings being left with the Minister of Munitions."[4]

This abdication of Treasury control increased the responsibility of the Minister of Munitions for carrying out munitions programmes as economically as possible, but Mr. Lloyd George always made it clear that the actual size of the programmes must be determined by the needs of the army and of the Allies, not by any financial considerations.

> "What we stint in materials we squander in life . . . what you spare in money you spill in blood. . . . The most fatuous way of economising is to produce an inadequate supply. . . . Two hundred million pounds can produce an enormous quantity of ammunition. It is forty days' cost of the war. . . . You must not pay extravagant prices, but for Heaven's sake, if there are any risks to be taken let them be risks for the pockets of the taxpayers, not for the lives of the soldiers!"[5]

He claimed, too, that the ordinary standards of careful financial administration could not always be maintained, owing to the desperate character of the situation. We have no time to bargain, he said

---

[1] Treasury Minutes, 20 August and 8 December, 1914. *Correspondence and Memoranda relating to the Financial Responsibility of the Ministry of Munitions*, pp. 38–40.

[2] Treasury Minute, 29 January, 1915. *Ibid.*, p. 41.

[3] See the terms of Treasury Minute, 24 January, 1916. *Ibid.*, p. 30.

[4] Treasury Minute, 24 January, 1916. *Correspondence and Memoranda relating to the Financial Responsibility of the Ministry of Munitions*, p. 32.

[5] *Parliamentary Debates* (1915), *H..of C.*, LXXVII, 118.

frankly, and must trust to the business men to do their best for the country.[1]

On the other hand, the new Ministry developed some financial principles of the first importance. The appointment of Mr. Lever[2] was followed by the inauguration of a system of cost returns at all national factories, which gave results of increasing value as the area of comparison widened. The inflation of contract prices for munitions had already reached its limit before Mr. Lloyd George took office. The War Office had learnt, from the prices quoted by certain firms who were outside the armaments group, that prices which were legitimate in time of peace for small scale production were too high when production was on an enormous scale.

The Ministry system of comparing cost returns, fortified by the power of examining contractors' books, made it possible to base contract prices on costs of production,[3] and put the Government in a much stronger position than it had been in since the system of competitive tendering broke down under the pressure of the enormous demand.[4] Again, as Mr. Lloyd George pointed out, a proper checking of costs and expenditure was essential to efficient factory management, and necessary, therefore, to secure the maximum output of munitions.

(c) Co-operation with the Allies.

Mr. Lloyd George felt that his responsibility for munitions supply included also the responsibility for working in close touch with the Allies, and making the best of their combined resources.

The strength and solidarity of the Central Powers convinced him that the Allies could never win until they renounced the independence and detachment which resulted in separate plans of campaign and competition in neutral markets for munitions and raw material. As early as February, 1915, he protested against " an Alliance conducted on limited liability principles," and urged that the Allies must bring all their resources into the common stock against the common enemy if they were to have any hope of success "[5]; and from that date, until the spring of 1918, he never ceased to struggle against the international jealousies and suspicions which stood in the way of a common policy in finance and munitions, a single plan of campaign and a single command.

---

[1] See also *Parliamentary Debates* (1915), *H. of C.*, LXXVII, 115.

[2] M.W./63878. *Parliamentary Debates* (1915), *H. of C.*, LXXVII, 114. Mr. Lever was given general responsibility for munitions expenditure, and before approving any expenditure was required " to satisfy himself that it was reasonable from the point of view of cost, and that proper steps had been taken to secure economy." General Office Notice, No. 11. 29 April, 1916.

[3] *Parliamentary Debates* (1915), *H. of C.*, LXXVI, 2078.

[4] The Financial Advisory Committee, appointed in December, 1915, after analysing costs of production, recommended large reductions in the contract prices for 18-pdr. and 4·5-in. ammunition. *Parliamentary Debates* (1915), *H. of C.*, LXXVII, 114, 115. For a full account of financial administration under Mr. Lloyd George, see Vol. III.

[5] *Parliamentary Debates* (1915), *H. of C.*, LXIX, 913.

His first achievement in this direction was when, as Chancellor of the Exchequer, he helped the Alliance towards a common policy in finance, the principle that Great Britain, France, and Russia should contribute proportionately to loans to the smaller States of the Alliance being adopted by a conference at Paris (5 February), which also sanctioned joint purchasing arrangements which would, it was hoped, do away with the ruinous competition in America.[1]

As soon as he became Minister of Munitions, Mr. Lloyd George got into close touch with M. Thomas, the French Minister of Munitions; and the conference at Boulogne (19 and 20 June), which shaped the Ministry's first munitions programme in the light of French experience, was followed by other meetings (7 and 8 July, 4–7 October) at which outstanding points of difficulty were settled; and M. Thomas and Mr. Lloyd George were able "to foresee a common programme."[2] Meanwhile various representatives of the Ministry were sent to visit French explosives, steel, and shell factories to gain knowledge of French methods, and of French labour conditions and labour-saving devices.[3]

At a conference between representatives of Great Britain, France, Russia, and Italy (23 and 24 November), Mr. Lloyd George did his utmost to bring about closer union from the munitions point of view, and to induce the Powers represented to show complete confidence in each other and contribute definite information as to their resources of raw material, machinery, and labour, and as to the use that was being made of those resources, especially the extent to which raw materials were being economised and skilled labour diluted. The conference decided to set up a central munitions office to collect information from all the Allies as to their munitions programmes, the orders placed at home and abroad, their reserves of raw materials, machinery or labour. At the same conference, Mr. Lloyd George repeated his plea for a general plan of campaign.

The plan for a central munitions office broke down owing to the reluctance of the General Staffs to disclose their secrets, and the general plan of campaign did not materialise.

Mr. Lloyd George's last appeal for unity during his tenure of office at the Ministry was on 6 May, 1916:—

> "We must have unity among the Allies, design and co-operation. . . . Design and co-ordination leave yet a great deal to be desired. Strategy must come before geography. The Central Powers are pooling all their forces, all their intelligence, all their brains, all their efforts. We have the means; they too often have the methods. Let us apply their methods to our means and we win."[4]

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXIX, 910–8.

[2] Speech by M. Thomas, 6 October.

[3] *e.g.*, Lord Chetwynd's mission. Sir F. Black's mission, 22–28 September, 1916 (C.R./4512). Mr. Duckham's mission, Sir Croydon Mark's mission (C.R./4512).

[4] Speech at Conway, 6 May, 1916.

IV. Organisation of the Ministry of Munitions.

(*a*) "Captains of Industry."

One of the most distinctive features of the Ministry of Munitions, as created by Mr. Lloyd George, was the appointment of successful business men to the chief executive posts. On 14 June he had announced his intention of utilising, as far as possible, the "business brains of the community . . . some of them at my elbow in London, to advise, to counsel, to guide, to inform and instruct and to direct," others "in the localities, to organise for us, to undertake the business in each particular locality on our behalf."[1]

The services of business men had already been utilised in Government Offices, but only in an advisory capacity; and, though there is some evidence that Mr. Lloyd George proposed at the outset to use the business capacity he had enlisted in the form of a central advisory committee,[2] this idea was soon thrown overboard, and the chief executive posts in the new Ministry were given to men of proved capacity in business.

The experiment he initiated was justified by its success, was continued by his successors, and was not without its influence on the composition of the administration formed in December, 1916.[3]

The value of business training in placing large scale contracts had already been recognised by the War Office, which had utilised the services of a number of business men—Sir George Gibb, who had been general manager and director of great railway undertakings like the North-Eastern Railway and the Underground Electric Railways; Mr. George Booth, a shipowner and a director of the Bank of England; Major-General Sir Percy Girouard, who, in addition to his experience as director of military railway traffic in Egypt and South Africa, and his administrative experience in Nigeria and East Africa,[4] had since 1913 been on the board of directors of Armstrong, Whitworth & Company; Mr. G. H. West,[5] local director and shell-shop manager of the same firm, who had unrivalled knowledge of shell production; and Mr. Alfred Herbert,[6] head of the machine tool firm of Alfred Herbert & Company, Ltd., of Coventry.

---

[1] Speech at Liverpool, 14 June, 1915.

[2] "We are on the look out for a good strong business man with some go in him, who will be able to push the thing through and be at the head of a Central Committee." *Parliamentary Debates* (1915), *H. of C.*, LXX, 1277. See also LXXII, 1190. As a result of this announcement public attention fastened upon the supposed search for a superman, and the phrase "a man of push and go" obtained the widest currency.

[3] *Parliamentary Debates* (1916), *H. of C.*, LXXXVIII, 1341.

[4] Railway traffic manager, Royal Arsenal, Woolwich, 1890–95; Director of Soudan railways, 1896–8; Director of railways, South Africa, 1899-1902; Governor of Northern Nigeria, 1908-9; Governor and Commander-in-Chief of East African Protectorate, 1909–12. His appointment as the head of "an emergency armament committee or department" had been suggested to Mr. Churchill by Captain Hankey in September, 1914. Hist. Rec./R/170/21.

[5] Afterwards Sir Glynn West.

[6] Afterwards Sir Alfred Herbert, K.B.E.

Most of these men, however, had been acting in an advisory capacity, and Mr. Lloyd George made a great breach in Government Office tradition when he appointed them and others of their type as heads of departments in the new Ministry. Thus Sir Percy Girouard became Director-General of Munitions Supply, Mr. West and Mr. Booth becoming heads of departments under him ; while Mr. Herbert continued his control of machine tools.

The new men introduced by Mr. Lloyd George included Mr. Eric Geddes, deputy general manager of the North-Eastern Railway, and Mr. Ellis, the managing director of John Brown and Company, which controlled the Coventry Ordnance Works, both of whom became Deputy Directors-General of Munitions Supply ; Major Symon, of Vickers, Ltd. ; Mr. James Stevenson, managing director of John Walker & Sons, Ltd., distillers, who became Director of Area Organisation ; Mr. E. W. Moir, a partner in the firm of S. Pearson & Sons and the designer of many great public works, who became head of an Inventions Department ; Mr. Alexander Roger, director of the Aberdeen Trust Company, the Premier Investment Company, etc., who became Director-General of the Trench Warfare Supply Department ; Mr. John Hunter, chairman of the Clyde Shipbuilding and Engineering Company, who was appointed Director of Factory Construction in October ; Mr. Owen Hugh Smith, director of Hay's Wharf, Ltd., the British-Thomson Houston Company, Ltd., etc., who was appointed Assistant Secretary ; Mr. Leonard Llewelyn, general manager of the Cambrian Coal Combine, who became responsible for raw materials ; and Mr. Lever, a distinguished chartered accountant and expert in cost accountancy, who was appointed to advise on contracts and cost accounts and later became Assistant Financial Secretary.[1]

This list is only an indication of the lines upon which Mr. Lloyd George worked. On 28 July he stated that there were

> " at least ninety men of first-class business experience who had placed their services voluntarily at the disposal of the Ministry of Munitions, the vast majority of them without any remuneration at all. . . . . Without their help it would have been quite impossible to have improvised a great department on the scale on which this department necessarily had to be organised."[2]

The same principle was followed in the country, where " management boards of business men " were set up in the areas to organise the available machinery for increasing the output of shells and other war material,[3] and in the administration of the National

---

[1] These afterwards became Rt. Hon. Sir Eric Geddes, G.C.B., G.B.E. ; Sir Charles Ellis, G.B.E., K.C.B. ; Lieut.-Colonel W. C. Symon, C.M.G. ; Sir James Stevenson, Bart. ; Sir Ernest Moir, Bart. ; Sir Alexander Roger ; Sir John Hunter, K.B.E. ; Sir Leonard Llewelyn, K.B.E. ; Sir Hardman Lever, K.C.B.

[2] *Parliamentary Debates* (1915), *H. of C.*, LXXIII, 2358. See also *Parliamentary Debates* (1915), *H. of C.*, LXXVII, 99.

[3] *Ibid.*, LXXVII, 107.

Projectile Factories and many of the Filling and Explosive Factories, where the Ministry delegated the work of erection and management to armament firms who had experience in running similar factories.

Everything was to be done promptly which involved "trusting to the integrity, to the loyalty, to the patriotism of the business men to do their best for the Government and to do it on fair terms."[1]

The ordinary traditions of Government Offices were followed in the staffing of the Secretariat and of the Contracts and Finance Departments, where the chief posts were held by permanent civil servants lent by other Government Departments—Sir Hubert Llewellyn Smith, Mr. Beveridge,[2] Mr. Rey, Mr. Wolfe, Mr. Hanson,[3] and Mr. Dannreuther.[4] The Inspection Department and the Design Department were almost entirely military, while another element was added to this composite Ministry by distinguished men of science like Lord Moulton and Sir Richard Glazebrook, the heads of the Explosives Supply Department and the National Physical Laboratory, respectively.

Under Mr. Lloyd George's system of administration the business men employed in the Ministry were given a very free hand, and allowed to transact business very largely by personal interview. Difficulty was therefore experienced in regard to the preservation of records of transactions, and in the frequent failure of the "captain of industry" to subordinate the interests of his own department to those of the Ministry as a whole.

The post of Director-General of Munitions Supply, occupied, after Sir Percy Girouard's retirement, by Sir Frederick Black, was designed to harmonise the activities of these powerful individual officials,[5] but as each of the Deputy Directors retained the right of personal access to the Minister,[6] the Director-General's authority was rather of an administrative than an executive character, and did not act as a curb on the activities of Mr. Lloyd George's captains of industry. Nor, in the early days of the Ministry, was there any reason for such restrictive action. Throughout the first year of the Ministry the ambitious and driving policy of these business heads of departments was just what was needed to stimulate the rapid production of munitions, but as man-power and material resources shrank it became necessary to limit their rivalling activities. In brief, in Mr. Lloyd George's time, it was almost impossible for any department to over-produce, but in the time of his successors an over-ambitious programme for one type of store might hamper the production of others equally necessary.

---

[1] Speech at Liverpool, 14 June, 1915.

[2] Afterwards Sir William Beveridge, K.C.B.

[3] Afterwards Sir Philip Hanson.

[4] Afterwards Sir Sigmund Dannreuther.

[5] Mr. Lloyd George had foreseen that there was a danger of their energies neutralising each other. *Parliamentary Debates* (1915), *H. of C.*, LXXII, 1190.

[6] Sir Percy Girouard's staff letter. Hist. Rec./R/263. 3/6.

It was the realisation of this danger that made the word " co-ordinate " almost an obsession in the later days of the Ministry, and necessitated the reform of administrative organisation under Mr. Churchill.[1]

The achievements of the Ministry were undoubtedly a triumph of the business man system, and looking back later on his work, Mr. Lloyd George paid a tribute to " a fine body of men of able experience."[2]

(*b*) Area Organisation.

The area organisation of the Ministry embodied another interesting administrative experiment.[3] The Boards of Management were designed as a device for decentralisation—to make the best use of local knowledge and local resources, and to avoid the delays and correspondence inevitable when transacting business with a Government Office in London.[4] Though not endowed with all the powers wielded by the Newcastle and Glasgow Committees,[5] they were responsible for organising the resources of their localities for munitions production. As Mr. Lloyd George pointed out, " there was no time to organise a central department which would be sufficiently strong and sufficiently well equipped to make the most of the resources of each district. . . . . We must rely upon the great business men to do the organisation in the districts for themselves."[6] The division of England into areas administered by Area Offices was also, in theory, a decentralising device. But during the first three months of the Ministry's existence the tendency towards centralisation became apparent. The supply officers at headquarters claimed and exercised more and more control over the production of the stores produced under Board of Management contracts, and the Contracts and Finance Branches exercised a closer supervision over the placing of those contracts.[7] Again, practically the only departments who worked through Boards of Management, even in this limited way, were the Gun Ammunition Department and the Trench Warfare Department—the latter to a very small extent. The other departments ignored the Boards of Management and placed their contracts directly. Local manufacturers were summoned to London for interviews ; all the important business of the Ministry tended to be transacted at headquarters. The prestige of the Boards of Management declined, and it was not until late in the history of the Ministry that a reaction against this centralisation became apparent.

---

[1] See below, Chapter IV.
[2] *Parliamentary Debates*, 23 February, 1917.
[3] For a full account of this, see Vol. II, Part II.
[4] *Parliamentary Debates* (1915), *H. of C.*, LXXII, 1188, 1192 ; LXXVII, 106.
[5] See Vol. I, Part III.
[6] *Parliamentary Debates* (1915), *H. of C.*, LXXII, 1191.
[7] Hist. Rec./H/1121, 22/1.

V. Munitions Policy in the Summer of 1915.

(*a*) The Boulogne Conference and the Calais Conference.

The conference at Boulogne (19 and 20 June) between Mr. Lloyd George and representatives of the French War Office and Ministry of Munitions was of vital importance.[1] In addition to the suggestions for closer contact and for better organisation of Allied purchases, which bore fruit later on, the conference revealed the need for an immense increase in the provision of heavy artillery for the British army. The British Higher Command had, of course, varied its standards of equipment with the experience of the war, but the standard set at the Boulogne Conference went far beyond anything hitherto accepted. The French representatives urged that armies engaged in trench warfare ought to be provided with as many heavy guns or howitzers as field guns, and that all the heavy pieces should be of 6-in. calibre and upwards, as medium weight guns and howitzers were useless against the German defences. In their opinion, practically all the ammunition for these heavy guns should be of the high explosive type, and in order to equal the combined German and Austrian output the Allies would have to produce ammunition at the rate of 230,000 rounds per day or 1,750,000 per week.

The magnitude of the effort necessary to meet this may be judged from the fact that the British army then had in the field 1,263 field guns and howitzers, but only 61 pieces of 6-in. and upwards. A certain amount of heavy artillery had been ordered by the War Office, but the maximum deliveries would fall far short of the standard set at the Boulogne Conference. The position with regard to gun ammunition was equally discouraging, the total deliveries from home and abroad for the week preceding the meeting at Boulogne being less than 125,000 rounds.

General Headquarters accepted the conclusions reached at the Boulogne Conference, and the statement of requirements forwarded by Sir John French to the War Office on 25 June was based on the needs of an army of 50 divisions armed with heavy guns on the scale advocated by the French. When forwarding Sir John French's letter to the Ministry on 30 June, the War Office asked for additional guns to equip 70 instead of 50 divisions and to provide for wastage and reserves.

Throughout June there was much public discussion in the newspapers and elsewhere on the extent and limits of the nation's military effort, but it was not until the Calais Conference of 7 July that any authoritative information was available.

At this conference, which was attended by the Prime Minister, Lord Crewe, Mr. Balfour, Lord Kitchener and Sir John French, and on behalf of the French by M. Viviani, M. Delcassé, M. Millerand, M. Augagneur, M. Thomas, and General Joffre, the whole military position and the prospects of the Allies were discussed, and Lord

[1] An account of this conference is given in Vol. II, Part VIII.

Kitchener stated that he contemplated putting an army of 70 divisions into the field in 1916. No definite pledge was given, and failure to provide that number could not be regarded as a breach of faith, though there was no doubt that the French would be very much disappointed.

But the pressure of events forced the Government to contemplate the necessity of putting a larger force into the field. During July and August the military position of the Allies was altered for the worse by the continued retirement of the Russians. The Germans began a new offensive towards Riga on 14 July, and on 17 July the Russian line was broken by General von Mackensen. By 22 July the Russians had fallen back across the Narev in the north and across the Vistula in the south. Warsaw fell on 4 August. Three weeks later the German centre had advanced about 100 miles, and on 25 August Brest Litovsk fell. The Russians had lost very heavily in men and material, and it was clear that the burden of the war must be borne by the French and the British until the Russian armies were re-armed and reorganised.

The situation on the western front was not encouraging. The army of the Crown Prince was resuming the offensive in the Argonne and the British lines were being attacked in Flanders, asphyxiating shells and flame projectors being used in both sectors to reinforce exceptionally severe bombardments. Owing to a shortage of ammunition no Allied offensive on a large scale could be contemplated, but local sorties and counter-attacks took a steady toll of the army's fighting strength, and large reinforcements were being called for.

Meanwhile the campaign in the Dardanelles was proving very costly. A fresh landing was effected at Suvla Bay, but the ammunition supply permitted only one attack on a large scale, which made no progress. On 16 August Sir Ian Hamilton cabled for reinforcements of men and munitions; but "the flow of munitions and drafts fell away," the enemy increased in strength, and sickness took a heavy toll of the troops, the casualties during the first three weeks of August amounting to 40,000 men, a very heavy sacrifice in view of the numbers engaged and the fruitlessness of their effort.

(*b*) Allied Resources in Men and Munitions.

Though on paper and on the population basis the Allies had an enormous superiority, on the basis of the armies that could be equipped and munitioned they had but a narrow margin.

As Mr. Lloyd George pointed out, Russia's unarmed millions could not be counted upon as an effective fighting force, and the rifle strength of her armies was dwindling daily. It was a war of munitions and of financial and industrial strength as much as of men, and it was this fact that neutralised the apparent superiority produced by Russia's vast population and natural resources.

Mr. Lloyd George laid stress on the danger of underrating the staying power of the principal enemy. He thought that before the Germans gave in they would call out one in eight of their population. That was their tradition and the tradition of Frederick the Great,

who called out boys of 16, and since the population of Germany and Austria was 120,000,000, they could call out 15,000,000 men before they gave in. The French were calling up one in nine of their population, and in the last resort Great Britain, which required a good deal of labour to finance the Alliance, might have to call up one in ten of the whole population of the Empire, which would mean about 6,000,000 men between 18 and 45.[1]

Again, the military position weighed the balance heavily against the Allies. There was no chance of breaking the German lines in the west until the Allied armies were supplied with heavy guns and ammunition on an enormous scale, which at the earliest would not be before the summer of 1916, and in the meantime there was more than a chance that the Germans would march on Petrograd and put the Russians out of the war. Even if a complete Russian *débâcle* was avoided, it would take two years to equip the Russian armies.

Italy was not a great industrial or military nation, and it was a mistake to reckon her possible contribution to the Allied cause, as some did, at three and a half million men—one in ten of her population—as even if she could raise such an army she could not equip it.

> "There is only Britain left. Is Britain prepared to fill up the great gap that will be created when Russia has retired to re-arm? Is she fully prepared to cope with all the possibilities of the next few months—in the west without forgetting the east? Upon the answer which Government, employers, workmen, financiers, young men who can bear arms, women who can work in factories, in fact the whole people of this great land, give to this question, will depend the liberties of Europe for many a generation."[2]

Faced with a crisis full of peril to the Allied cause, the Government concluded that it would be quite unsafe to draw a sanguine conclusion from the figures of belligerent strength. Apart from the grave military position of the moment and the prospective difficulty of providing munitions for the Allied armies, the holding of the interior lines by the Central Powers and their practical unity of command, to say nothing of the prestige of recent successes, were worth several army corps to them. The military situation and the needs of the Allies therefore called for the largest army Great Britain could maintain and equip without imperilling her other contributions to the Alliance. Since it appeared that an army of 70 divisions would give but a trifling superiority over the enemy, every division up to a 100 that could be formed should be placed in the field.

In Mr. Lloyd George's words :—

> "The number of men you put at the front does not depend upon us in the least. It is going to depend on the Germans, and what the Germans are going to do during the next three months in Russia. If they succeed in putting the Russians

[1] By 11 November, 1918, one in eight of the population had been called up.
[2] *Through Terror to Triumph*, August, 1915.

out of action . . . during 1916, as a great offensive force, for us simply to keep 70 divisions at the front is suicide; not only that, it is murder, because to send a number of men who are obviously insufficient to defend a position which requires a much more considerable force is just murdering our countrymen without attaining any purpose at all."

(c) The Financial Limits of Enlistment.

From the financial point of view the policy of raising an army of more than 50 divisions was a debatable one. Great Britain was making a four-fold contribution to the Alliance. In addition to maintaining and equipping the navy and the army, she had to provide money and munitions for her Allies. It was vital to find out how the national effort could be best directed and how large an army could be equipped and put in the field without jeopardising the supremacy of the navy, and without allowing such a decline of exports as would create a ruinous balance of trade and prevent Great Britain financing herself and helping to finance her Allies. Sea power was of paramount importance; and the navy, which had the first call on the nation's manhood, workshops, and revenue, absorbed 342,465 men plus a monthly intake of 4,000, and was estimated to employ two-thirds of the engineering resources of the country.

The strain upon Great Britain was enormous. The army cost about £2,000,000 a day and the navy over £200,000,000 a year. She was spending therefore nearly a £1,000,000,000 a year on her fighting forces, while loans to Allies approximated £1,000,000 per day with a constant tendency to increase.

As the war went on the Allies became more and more dependent upon Great Britain's productive power. Some of the most important industrial districts of France, with her steel works and coal mines, were in the hands of the enemy, and France wanted steel and other material from outside, which were either supplied by Great Britain or bought on her credit. The advances to France were taking the form of millions of yards of cloth, large quantities of coal and coke, explosives materials, manufactured steel, barbed wire, etc., and Great Britain was financing Russia's purchases of munitions in the United States.[1]

There was an adverse balance of trade amounting to about £400,000,000 a year in 1914, which was reflected in the fall of the exchanges. During the first seven months of 1915 there had been a decline of some 27 per cent. in the exports of British production as compared with the corresponding period of 1914, side by side with an increase of about 16 per cent. in the value of imports.[2] As long

[1] By June, 1916, one-third of the whole British production of shell steel was given to France, and 20 per cent. of the British machine tool production was destined for the Allies. *Parliamentary Debates* (1916), *H. of C.*, LXXXV, 1683.

[2] Memorandum by Sir William Ashley.

as the war lasted this excess of imports would continue. England at war consumed larger quantities of food; it imperatively required material for munitions and other military supplies.

No precise figure could be given as to the income from invisible exports in 1915, but it was estimated that £300,000,000 was an extreme maximum figure for the income in question, so that an adverse balance of at least £100,000,000 a year would have to be financed in addition to the expenditure on munitions, which did not enter into the ordinary trade returns.

During the first year of the war the adverse balance of trade had been financed by the export of gold to America and by the sale of American securities, but it was thought that the potentialities of both these remedies were nearing their limit. British investments in the United States only amounted to about £600,000,000, and when these had been sold or pledged it was difficult to see how American purchases of munitions, which already amounted to about £200,000,000, were to be financed. A further fall in the exchange could only be retarded by raising a loan in America, but this again was a strictly limited remedy, since Americans had not learnt the habit of making extensive investments in foreign securities, and most of the big contractors insisted on payment in cash in order to re-invest it in their businesses.

It could therefore be argued that Great Britain could not increase her military effort without risking a financial collapse that would bring down the whole Alliance, and that her best contribution to the Allied cause was to limit her military effort in order to equip and munition her Allies, especially those who were not industrial nations.

Mr. Lloyd George, however, was not prepared to admit that the nation's military effort must be limited by these financial considerations. He laid stress on possibilities of replacing male labour taken for the army by the labour of women, boys and older men, and on the elasticity of production which followed on the adoption of better methods, the increased use of machinery and other labour-saving devices, and a greater effort on the part of the workers. The effect of this had obviously already been enormous and its possibilities were by no means exhausted. Though some 2,500,000 men had been withdrawn from industry, the export trade had not fallen to nearly the extent which might have been expected, while the production for domestic consumption had actually increased.

Again, a great reservoir of energy might be released by enforcing economies in domestic consumption, by discriminating against luxury trades by heavy taxation, and by withdrawing labour from all occupations which did not assist, directly or indirectly, to kill Germans or to maintain the export trade, and might therefore be regarded as unnecessary and non-productive.

The community, he argued, would have to return to its older and simpler level of expenditure, and would have to realise that the prevalent prosperity was artificial and that the nation was living

upon borrowed money.[1] The potato-bread spirit in Germany was a thing to dread, not to mock at.[2] In England there was too much disposition "to cling to the amenities of peace—business as usual, enjoyment as usual, fashions, lock-outs, strikes, ca'canny, sprees—all as usual."[3]

He argued that Great Britain's power of borrowing in America and the strength of the country's credit had been underestimated. In this time of necessity and crisis, the productive energies of the world had been spurred on to a greater effort which, in some degree, compensated for the wastage of war. It was certain that the financial situation could be brought into conformity with the natural and actual facts of the world's production. It had already been the experience of every belligerent country in the war to be informed that the financial difficulties at this or at that stage were insuperable, but they had in all cases been overcome with surprising ease.[4]

Arguments of this kind, together with the critical military situation and the fact that Lord Kitchener had already given a virtual if not an explicit promise that Great Britain would put 70 divisions into the field in the spring of 1916, made the Government decide (August, 1915) that 70 divisions was the minimum force which Great Britain must raise, equip and maintain.

VI. The Development of Munitions Programmes (August to September, 1915).

The decision that 70 divisions was to be the nation's minimum effort raised vital questions of munitions and man power.

From the munitions point of view the situation was very hopeful. The new Ministry had already accomplished much, and, most important of all, it had been inspired by Mr. Lloyd George with a clear-cut policy—the determination to achieve and, if possible, surpass the Boulogne standard of equipment for an army of 70 divisions by the opening of the 1916 campaign, and to reach that standard for an army of 100 divisions later in the year. This involved preparations for production on an immense scale—the setting up of national factories all over the kingdom,[5] the exploitation of the local energy already harnessed in the production of munitions, the control of the Ordnance Factories, and the placing of huge contracts in the United States and Canada.

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXI, 1742.
[2] Speech at Bangor, 28 February, 1915.
[3] 29 July, 1915.
[4] By 1 November the American exchange had fallen to 4·64, 20 cents below the normal rate. Shipments of gold and the sale of securities brought it back to 4·70 by 22 November, and by January, 1916, the Government scheme for mobilising British-owned American securities had raised it to 4·78½.
[5] During his period of office 95 new factories were built, including 18 Filling Factories, 32 National Shell Factories, 12 National Projectile Factories, 22 Explosives Factories, 6 Cartridge and Cartridge Case Factories, 1 Gauge Factory, and 1 Small Tool Factory. *Parliamentary Debates* (1916), *H. of C.*, LXXXV, 1695–6.

Though the campaign of 1916 was not the limit of his horizon, no effort was spared and no possible source of supply left untried which might increase the supply of munitions for the critical months of that campaign, and by 16 August, 1915, Mr. Lloyd George had made arrangements which enabled him to speak with a certain amount of confidence. He anticipated that the scale laid down at Boulogne for an army of 70 divisions could be reached in many, but not quite all, essentials from April, 1916, onwards, and that later in the year a 100-division army could be provided for.

(*a*) GUNS.

The chief difficulty was with guns, especially of the heavy types, as the experience of the war and the decisions of the Boulogne Conference had revolutionised all the standards of equipment in this respect.

There was, comparatively speaking, little difficulty with field guns. The pre-war standard of the British army had been a generous one, 897 guns of this type being in existence at the outbreak of the war. Large additional orders had been placed in October, 1914, and on 30 June, 1915, there was a stock of 1,700 guns, with a certain number of 15-pdrs. and 13-pdrs. in addition. It was hoped that the 3,407 extra guns required to bring the number up to the 5,107 asked for by Sir John French would be ready by June, 1916—that is to say, that there would be field guns for 100 divisions with a margin of 600 18-pdrs., 228 15-pdrs., and 312 13-pdrs.[1]

The field howitzer position was less satisfactory. The number existing at the outbreak of war, 169, had been almost doubled, which made a stock of 334 on 30 June, but there were very heavy arrears on the War Office orders owing to the fact that the principal contractor for 4·5-in. guns—the Coventry Ordnance Works—had been exceptionally busy with naval work.[2] In spite of French opinion, British General Headquarters attached great importance to this weapon, and a total of 1,618 was aimed at. Only 1,000 of these guns would be delivered by March, 1916, and the total would not be reached until December.[3] Though this showed an extraordinary improvement on the position at the outbreak of the war, it was clear that the provision of 4·5-in. howitzers would not be up to the 70 division standard in time for the spring offensive, though the 80 5-in. howitzers already in the field might make up the deficiency to some extent.

There would be no difficulty in providing the very heavy artillery, 12-in. and 15-in., by the spring of 1916. The 12 15-in. howitzers ordered by the Admiralty in August, 1914, were expected by the end of 1915 and 48 12-in. howitzers were to be ready in March, 1916.[4]

[1] Between 30 June, 1915, and 1 July, 1916, 2,586 new 18-pdr. guns were approved or under inspection. (HIST. REC./H/1200/14.)

[2] HIST. REC./R/1000/10.

[3] Between 30 June, 1915, and 1 July, 1916, 1,103 new 4·5-in. howitzers were approved or under inspection, 1,059 had been delivered to service, which made a total of 1,393 at that date. (HIST. REC./H/1200/14.)

[4] The number of 15-in. howitzers was complete in July, 1916, but only 38 12-in. howitzers had been approved or were under inspection at that date.

The most formidable problem was to equip the army with guns and howitzers of calibres between 4·5 in. and 12 in. The bulk of the orders was not placed until after the formation of the Ministry, and there was no prospect of arming 70 divisions with 60-pdr., 6-in., 8-in. and 9·2-in. weapons on the scale agreed upon at Boulogne until the end of 1916.

On 30 June, 1915, there were only 68 60-pdrs. and 86 6-in. howitzers in existence, and only 148 new 60-pdrs. and 16 new 6-in. howitzers had been ordered up to 31 May; these numbers would have to be raised to 800 60-pdrs. and 560 6-in., which could not possibly be delivered until October and September, 1916, respectively. There was the same difficulty with 8-in. and 9·2-in. weapons. The War Office had ordered before 31 May 23 8-in. and 32 9·2-in. howitzers, and the Ministry had given orders which would bring the totals up to 72 8-in. and 300 9·2-in. The 72 8-in. would not be delivered until May, and by the end of 1916 only 270 9·2-in. would be available. As it was much easier to make the 8-in. than the 9·2-in., there was afterwards some substitution of the former for the latter in the proportion of five to three.[1]

Mr. Lloyd George pointed out that though the Boulogne standard for guns of these types would not be reached, even for 70 divisions, by the spring of 1916, the armament that would be available by that date was immensely superior to anything hitherto contemplated. By September, 1916, 70 divisions could be armed with many more field guns and many more 4·5-in. howitzers than the old standard required, and with about six times as many heavy guns (1,892 instead of 235) as were regarded as necessary under the old standard. It was quite clear to him that a shortage of artillery would not be the limiting factor which would prevent 70 or, if need be, 100 divisions from being put into the field.

As has been seen, he was convinced that 100 divisions were called for by the needs of the Alliance, and in order that there should be no shortage of munitions if the Government decided to put such a force into the field he determined to provide guns on the 100 divisions scale. At the end of August, therefore, he gave on his own responsibility additional orders for heavy guns, and in addition to providing a margin in each nature, he deliberately ordered extra guns in the hope of obtaining earlier deliveries in the critical months of 1916. This bold measure provoked controversy with the War Office, which was not prepared to admit the necessity for these huge orders, and

---

[1] See Vol. X, Part I. Between 30 June, 1915, and 1 July, 1916, the following new guns had been approved or were under inspection :—

404 60-pdrs.
300 6-in. howitzers.
73 8-in. howitzers.
112 9·2-in. howitzers.

Between June, 1915, and June, 1916, the monthly output of heavy guns increased more than sixfold. *Parliamentary Debates* (1916), *H. of C.*, LXXXV, 1681.

doubted its ability to supply gunners and gunner officers for these additional weapons. Mr. Lloyd George, however, maintained his position.[1] He was supported by the Cabinet[2] and justified by the fact that the War Office later increased its requirements.[3]

"For this one courageous feat alone," said Mr. Montagu later, "the country owes him the greatest debt of gratitude."[4]

(*b*) Artillery Ammunition.

The shortage of artillery ammunition was a source of grave anxiety. Of the 5,573,000 shell bodies ordered by the War Office at home and abroad for delivery by 1 June, 1915, only 1,992,000 had been delivered.[5] Mr. Lloyd George thought that the failure of the British contractors, who had delivered 852,000 out of the 2,786,000 due from them by the terms of their contract, was not entirely due to the labour shortage, and that orders should be spread as widely as possible among the engineering firms of the country instead of being congested in a few hands.[6]

> "To be quite candid, the armament firms were inadequate to the gigantic task cast upon them not merely of organising their own work, but of developing the resources of the country outside. They could not command a staff. Sub-contracting therefore has undoubtedly been a failure."

In August, Mr. Lloyd George drew attention to the delay which occurred between delivery of empty shell at Woolwich and its issue as a complete round, which was largely responsible for the fact that the War Office requirements for ammunition could not yet be met. During the previous six weeks the discrepancy between shell delivery and issue had amounted to 600,000 rounds,[7] and in Mr. Lloyd George's opinion this discrepancy was due to inadequate capacity for filling and storing and to the delay in delivering certain components such as primers and gaines, which in turn was due to War Office delays in ordering these components and making timely arrangements for their delivery. Steps had been taken to remedy this ; new Filling Factories and storage bonds were being set up, arrangements were made so that all the components should keep step in delivery, while in order to put an end to the duplication of authority the control of the Ordnance Factories was transferred to the Ministry, including the Royal Laboratory at Woolwich, which was still responsible for nearly the whole of the shell filling and completion.

Mr. Lloyd George now adopted the definite policy of budgeting for a surplus. Accordingly the full amount of ammunition required

---

[1] See Vol. X, Part I.
[2] *Ibid.*
[3] *Parliamentary Debates* (1916), *H. of C.*, LXXXV, 1703.
[4] *Ibid.*
[5] Hist. Rec./R/1000/10.
[6] For a full account of this policy and its supersession in March, 1915, by the policy of spreading contracts, see Volume I, Part III.
[7] Hist. Rec./R/1000/10.

was ordered in the United Kingdom, and additional orders were given in the United States and Canada to create a margin of one-third for fear deliveries should not come up to time.

In this way Mr. Lloyd George hoped to secure that the supply of shells would not be a limiting factor in the future, and that the Ministry would be able to provide sufficient ammunition for defensive operations by October, 1915, and for offensive operations by March, 1916.

In the September battles, in spite of the fact that the expenditure of ammunition surpassed all previous records, there was no shortage, and the Chief of the Imperial General Staff reported that supplies were sufficient.[1]

The improvement continued, and by the end of Mr. Lloyd George's tenure of office the output which, in 1914–15, it took twelve whole months to produce could be attained from home sources in the following periods :—

For 18-pdr. ammunition in three weeks ;
For field howitzer ammunition in two weeks ;
For medium-sized shell in eleven days ;
For heavy shell in four days.

The weekly deliveries to the War Office averaged just over a million rounds in July, 1916, of which rather over 50 per cent. were high explosive shell,[2] as compared with a weekly average of 166,500 rounds in June, 1915, of which only 23 per cent. were high explosive.[3]

(*c*) Explosives and Propellant.

The strongest point of the whole munitions programme of August, 1915, was the prospective supply of explosives and propellant.

A letter from Lord Moulton to the Minister (13 September) summarised the position :—

> " Supply has always been more than equal to the demand, and there is every reason to believe that in the future it will be abundantly sufficient to meet the largely increased demand."

The output of all kinds of explosives was about 100 tons a day, and was expected to reach 300 tons a day by the beginning of 1916.[4] Substantial stocks had been accumulated, and both raw material and finished explosives in large quantities had been given to the Allies. The sufficiency of the supply of high explosives, however, was entirely dependent on the use by the army of the amatol mixtures, and on the 80/20 mixture being accepted for two-thirds of the amatol supply, since the supply of pure T.N.T. and picric acid would only go a very little way towards satisfying the requirements of the Navy and Army. Though a prospective shortage of propellant had caused some anxiety in May and June, the erection of the new

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXVII, 109.
[2] 1,086,500 rounds, of which 593,200 were H.E. and 493,300 were shrapnel.
[3] See Vol. X, Part III.
[4] By June, 1916, the daily output was over 500 tons.

factories at Gretna and Queensferry and the adoption for the land service of a substitute for cordite had made the future in this respect pretty secure.[1]

(*d*) Rifles.

When the Ministry was formed the rifle position was very serious, and no considerable improvement could be expected until March, 1916, when deliveries on the big American orders placed in March, 1915, would probably begin. Mr. Lloyd George thought that the difficulty was entirely due to the War Office delay in placing orders on a big scale, and to the fact that no order was given for new machinery at a time when it might have been quickly obtained.

The shortage of rifles resulting from the late placing of the necessary orders was aggravated by the high rate of wastage, which was calculated by the War Office at 12 per cent. gross and 8 per cent. net per month. By June, 1915, the wastage already aggregated 118,000, and if it were to continue at the same rate over the larger armies it was proposed to keep in the field it would aggregate 1,312,000 by June, 1916, or considerably more than the total number of rifles ordered before the big orders of April, 1915, were placed.

It was estimated that in August, 1915, the army had 1,400,000 rifles, and that by March, 1916, 1,068,000 new rifles would have been delivered, from which wastage would have to be deducted. Even at that date the home supply would hardly be sufficient to cover wastage,[2] and if the American supply fell short of expectations there would be no increase in the total available for the army.

Rifle plants had been extended, and a large amount of work had been "peddled out" to firms who undertook to make components, but Mr. Lloyd George drew attention to an alarming fact—

> "We in this country are working up to practically all our capacity, and while it is true that in a few months we shall be able to turn out 90,000 where we are now turning out 50,000 there is nothing which we can think of which would enable us to turn out much more than a million new rifles in this country in a year."[3]

It was anticipated that 361,000 rifles would be delivered (96,000 British and 264,000 American and Canadian) in June, 1916; 309,000 in July; 264,000 in August, and 308,000 in September, which would bring the total number supplied to the troops from the outbreak of the war to 4,501,000, of which 3,337,000 would be new production.[4]

---

[1] During the last six months of 1916 the output of propellant was 45,812 tons as compared with 17,019 tons from July to December, 1915.

[2] The home output in March would be 92,000 per month, which was a little short of the estimated wastage of an army of 70 divisions.

[3] *Parliamentary Debates* (1915), *H. of C.*, LXXVII, 112. In June, 1916, the British output of new rifles averaged 18,818 per week—less than a million a year—while, including American and Canadian rifles, the rifles accepted from 30 May, 1915, to 1 July, 1916, totalled 1,152,680.

[4] Hist. Rec./R/1000/10. In the third quarter of 1916, the number of rifles accepted was 807,639 as compared with Mr. Lloyd George's estimate of 881,000.

It was not easy to translate these figures in terms of the divisions that could be placed in the field, owing to the fact that the War Office figures as to the number of rifles required to equip a division varied. On the basis of the lowest estimate—12,000 per division—the 1,034,000 rifles which would be available for the Expeditionary Force in March, 1916, would equip 80 divisions. One hundred divisions could be equipped on the same basis in June, leaving at home a reserve of 755,000 rifles in March and 905,000 in June. Mr. Lloyd George therefore calculated that, by leaving a smaller reserve at home, 100 divisions could be equipped, as far as rifles were concerned, in March. Further, he had a feeling that the figures of wastage calculated by the War Office ought to be checked by information from the front, wastage on the scale given implying a good deal of carelessness. He hoped that as the armies increased in size the wastage of rifles would diminish, as a larger proportion of troops would be out of the line. The heavy rate of wastage was largely due to the mud, and when the pressure on the army became less, it might be diminished by increased care and improved arrangements for salvage.

(*e*) Machine Guns.

The prospects of getting the army adequately equipped with machine guns was not very hopeful. As Mr. Lloyd George pointed out (16 August), it was the most unsatisfactory item in the whole equipment. The Germans had an overwhelming supply of machine guns —at least 16 per battalion, probably more, as well as unattached batteries which moved about from place to place. The British equipment was a great contrast to this. The idea before the war was to equip each battalion with two machine guns. The standard had already been raised to four, and would be raised to eight as soon as possible. At the moment, however, the important question was whether the War Office requirements could be met. A 70 division army on the scale of four guns per battalion would need about 6,000 guns, exclusive of wastage, the minimum on the German scale being 18,000 guns.

There were only 1,920 machine guns in the field, and the War Office estimated that 4,409 additional guns were needed in August to bring the establishment up to strength (allowing for wastage), yet deliveries were only at the rate of 110 a week, about 11 per cent. of the requirements.

The Ministry had placed orders at home and abroad for 30,000 new guns. The firms had been helped with machinery, labour, and material. A new factory had been equipped for the manufacture of the Vickers gun, and two new factories for the manufacture of other types,[1] and it was hoped that the position would gradually right itself. Though in March deliveries, allowing for wastage, would barely suffice to arm 70 divisions on the new scale of eight guns per battalion, by June 100 divisions could be armed on this scale, while from September onwards there was a prospect of arming them on the German scale.

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXVII, 3.

The following table gives the official estimate of the position as submitted by Mr. Lloyd George :—

Date.	*War Office requirement on a 70 division basis.*	*Probable deliveries.*
31 October, 1915	6,025 ..	1,895
January, 1916	8,689 ..	5,591
31 March	10,825 ..	9,316
30 June	13,000 ..	17,856
September	15,000 ..	28,800

This forecast was realised. By the end of June 18,843 machine guns had been delivered,[1] and by July, 1916, the weekly output had increased fourteenfold since the Ministry of Munitions was founded, and Mr. Montagu stated that the increasing demands of the War Office would shortly be satisfied.[2]

(*f*) Small Arms Ammunition.

There was a considerable gap between estimated requirements and deliveries of small arms ammunition during the first twelve months of the war. It is estimated that requirements were over 1,000,000,000 rounds, while the total deliveries for the period were 643,727,000, made up of 119,521,000 from Woolwich, 432,777,000 from British trade, and 91,423,000 from the United States.[3]

Issues had steadily increased from 17,000,000 rounds a month in August, 1914, to 115,000,000 rounds a month in June, 1915, and at the beginning of July the situation was very serious, the stock at Woolwich on 1 July being only 1,000,000 rounds.

On the formation of the Ministry the War Office forwarded requirements based upon an expenditure in the Expeditionary Force of four rounds per day per man for 80 per cent. of the total force, with additions for machine gun requirements, practice rounds and reserves.[4] In August deliveries of small arms ammunition were still short of these requirements, but it was anticipated that in a few weeks' time requirements would be met, the estimated monthly output being as follows :—

July, 1915	129,000,000
August, 1915	173,000,000
September, 1915	186,000,000
December, 1915	233,000,000
March, 1916	305,000,000
April, 1916	371,000,000

This represented a huge growth in output since August, 1914, when the total production for the month had been approximately 11,000,000.

---

[1] (Printed) *Weekly Report*, No. 49, VI (8/7/16).

[2] *Parliamentary Debates* (1916), *H. of C.*, LXXXV, 1681. The weekly output in the third quarter of 1916 averaged 736. *Review of Munitions Output*, 1914–18.

[3] D.D.G.E./E.M.2/208.

[4] Hist. Rec./H/1440/3.

Mr. Lloyd George thought it probable that the War Office would increase its demand in view of the large number of machine guns that were being ordered, but additional output would be arranged to meet this. Experience was already showing that the wastage in the field was over-estimated and that output was more nearly meeting requirements than the figures showed.

By July, 1916, the home production of small arms ammunition was nearly three times as much per week as it was a year before,[1] the acceptances amounting to 61,000,000 a week as compared with 22,000,000.[2]

(*g*) Trench Warfare Supplies.

When reviewing the general situation in August, 1915, Mr. Lloyd George showed that supplies for trench warfare would not be a limiting factor. Great progress had been made since the establishment of the Ministry and he had already ordered 1,000 Stokes mortars with a supply of ammunition in anticipation of a specific demand from the War Office, his object being to widen the source of supply by making use of the services of firms which had never before made munitions. A very large quantity of hand grenades were being provided, a proportion of the latter being filled with chemicals.[3] Defences against German "frightfulness" had been improvised, and means of retaliation were being prepared. Great volumes of gas were being provided for the first time, 3,000 cylinders of gas having been sent to France and the Dardanelles by August, and 6,000 by 25 September, when the first British gas attack took place. About 150 tons a week of chlorine were being produced, and other poison gases were ready, and awaiting War Office approval of a suitable form of shell.

(*h*) Summary.

The final result of Mr. Lloyd George's survey of the position was his conviction that the military effort of the country in the following year would no longer be neutralised by the shortage of munitions, and that in 1916 the Ministry would be able to equip the largest armies that were likely to be put into the field with munitions on the new scale that had been laid down at Boulogne. Munitions could be provided for 70 divisions in the spring and for 100 divisions very soon after. There were several weak spots, notably medium heavy guns, 4·5-in. howitzers, and machine guns, but if some assistance was obtained from the Admiralty two of these weak spots might be strengthened.

---

[1] *Parliamentary Debates* (1916), *H. of C.*, LXXXV, 1682.

[2] (Printed) *Weekly Report*, No. 49, VI (8/7/16). The total production in the second quarter of 1916 was 734,597,000 as compared with 239,505,000 in the same quarter of 1915. *Review of Munitions Output*, 1914–18.

[3] By December the output of grenades was forty times what it was when the Ministry was set up. (*Parliamentary Debates* (1915), *H. of C.*, LXXVII, 113.) The output of trench mortar bombs increased thirty-threefold between May, 1915, and May, 1916, and at the latter date 150 times the amount of high explosive was required to fill them. (*Parliamentary Debates* (1916), *H. of C.*, LXXXV, 1683.)

In any event the equipment even of an army of 100 divisions would be on a scale infinitely superior to the equipment of the smaller army then in the field.

VII. The Man Power Problem.

(*a*) Supply of Male Labour.

A munitions programme of this magnitude made large demands upon man power. The whole of Mr. Lloyd George's forecasts as to munitions supply depended, as he had pointed out again and again, on obtaining a sufficient supply of labour.

> "The difference between promise and performance is almost entirely due to scarcity of skilled labour. The Government have to choose between their heavy gun programme time and keeping about 40,000 skilled men with the colours in France and in this country. There are 120,000 men in the skilled trades who have already joined the colours, and I cannot get them back. I am going to urge you strongly to press for the restoration of these men to the yards. Without it we cannot hope to carry out our old, let alone our new, programme."

The prospects of obtaining enough men by existing methods were not very encouraging. The Labour Department of the Ministry had been actively at work. The number of workers employed at Waltham, Enfield, and Woolwich and at 13 private works had increased between 3 April, 1915, and 11 September, 1915, by 44 per cent.,[1] the transfers having been effected through the Labour Exchanges and through the war munitions volunteers' scheme, while night shifts and the dilution of labour had been extended. New arrangements for the release of men from the colours were in force, and a scheme for the issue of badges to munition workers had been adopted, 150,000 badges having been issued up to 10 September. Finally, under the provisions of the Munitions of War Act, 715 firms,[2] employing nearly 700,000 workpeople, had been declared controlled establishments, which involved the limitation of profits and the suspension of trade union rules. But this was not enough. The number of men available for transfer under the war munitions volunteer scheme was disappointing and fell far short of the demand, and he emphasised the difficulty under existing arrangements of getting releases from the colours.[3] The output of the men already employed on munitions

---

	Employed on 3 April.	*Employed on 11 September.*
[1] In Government Arsenals	36,393 ..	47,954
In 13 Private Works	62,924 ..	94,993
Total	99,317	142,947

[2] The figures are up to 6 September. By 6 December 2,026 works had been declared controlled.

[3] For a full account of the supply of labour under both these schemes, see Vol. IV, Part I.

could be improved by the suspension of restrictions on output already arranged for, by increased dilution, and by the introduction of labour-saving devices wherever possible. But even if, as was estimated, an increase of 25 per cent. on the normal output could be obtained by these means, the fact still remained that the new munitions programme called for the release of 100,000 skilled men from the army, which meant the addition of 100,000 men to the 1,500,000 recruits who would be required during 1916 to keep 70 divisions in the field.

Mr Lloyd George took a very strong line on the question of compulsory military service. He was convinced that compulsion was inevitable, that the struggle could not be settled by a decisive victory until the autumn of 1916 at the earliest, and that voluntary recruiting would not suffice to meet the appalling wastage of modern war. He combated the idea that there was any indignity about compulsion. He showed that great democracies in peril had always had to resort to compulsion to save themselves, and appealed to the French conception of liberty, equality, and fraternity.

> "When the country is in danger, then liberty means the right of every man to defend her; equality means equality of sacrifice . . . . fraternity means the brotherhood of endurance."

The Russian *débâcle* threw a vivid light on the dangers of post-poning compulsion.

> "I think the longer you delay it, the nearer you will be to disaster. I do not believe, for instance, that you can keep up your armies at the front without it, unless you are going deliberately to cut the numbers of the forces down to a figure which will be inadequate and which is known to be inadequate in advance. . . . Can we keep things going for two years merely upon the voluntary system? We cannot. . . . . The drafts we have to send to France now are nothing to the drafts we will have to send when the Germans begin to attack in earnest."

The Government as a whole was not prepared to go as far or as fast as Mr. Lloyd George, and the Prime Minister decided that the introduction of conscription should be delayed until the voluntary system had been given a further trial.

The work of preparation for a final effort began at once. When Parliament met on 14 September, the Prime Minister and Lord Kitchener made some significant comments on the military situation and on the need for sustained effort,[1] and on 6 October they issued a very strongly worded appeal for men. On 11 October Lord Derby was appointed as Director of Recruiting, and on 19 October the Derby scheme was launched. Four days later came the King's appeal for men of all classes to make good the sacrifices already given by coming forward voluntarily to take their share in the fight.

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXIV, 47, 50–51; *H. of L.*, XIX, 816–818.

Voluntary recruiting then entered upon its final campaign, and the nation knew that if this effort failed conscription would inevitably follow.

Lord Derby's report (4 January, 1916) showed that 651,660 single unstarred men had not attested. The Prime Minister, therefore, redeemed his pledge that single men should be called up first by introducing a Military Service Bill (5 January), which received the royal assent and came into force on 11 February. The second Military Service Act was passed on 25 May, and on the same day the King congratulated the nation on the magnificent results achieved by voluntary enlistment, 5,041,000 men having been voluntarily enrolled since the beginning of the war.

The fears aroused by Mr. Lloyd George's statements that if voluntary methods failed to produce the labour required for munitions work compulsion must follow were revived by the introduction of the Military Service Bills. Labour leaders feared that they might be used as a lever to promote industrial conscription, and the Government had to give a specific pledge to the contrary.

(*b*) Dilution.

Since he had failed to carry his wider policy of national service, Mr. Lloyd George turned his energies to making the best use of the labour available under the existing system by diluting it with unskilled and women's labour. He made many efforts to overcome the obstinate resistance to dilution. In his speech at the Trade Union Conference at Bristol (9 September), he called upon labour to carry out the bargain made by its leaders at the Treasury Conference—that in return for the limitation of profits and the guarantee that pre-war conditions should be restored at the end of the war, that piece rates should not be reduced and that the time rate of the skilled men should be paid to dilutees, they would suspend every regulation or practice which restricted output or interfered with the best use being made of the labour available.[1]

On 20 December, 1915, he made another powerful appeal to both employers and workmen not to delay any longer in introducing unskilled labour into the workshops. He showed that, owing to the shortage of skilled labour, machines for machine-gun production were standing idle, and that unless skilled labour was replaced by unskilled labour wherever possible the new factories could not be manned.

He showed that victory depended upon it, and that further delay would be fatal.

> "In this war the footsteps of the Allied forces have been dogged by the mocking spectre of 'too late'; and unless we quicken our movements, damnation will fall on the sacred

[1] Extracts from this speech and a full account of the beginnings of dilution are given in Vol. IV, Part I, Chapter III.

cause for which so much gallant blood has flowed. I beg employers and workmen not to have 'too late' inscribed upon the portals of their workshops."[1]

(c) Women's Labour.

Mr. Lloyd George was convinced of the necessity of making the fullest possible use of women's labour, both in munitions production and in other directions. He pointed out that while in Germany, Austria, and France agricultural work was being done by women, there was in England a notion that it was degrading to call upon women to do work of that kind, and there was a great deal of women's labour available that was not being used at all. He arranged that women's labour should be used to the fullest possible extent in the national factories, and the dilution there practised became the standard by which dilution on other armament work was judged.[2]

The wages policy he adopted is "a landmark in the history of women's wages."[3] It was founded on the principle of equal pay for equal work, and was designed to protect the skilled workman against the competition of cheap unskilled labour—the dread of which was the chief obstacle to dilution. The decision that women performing skilled work were to be paid at the skilled man's rate, and that the minimum time rate was to be £1 per week, introduced a new standard which has reacted upon women's wages throughout the whole industry of the country.

Mr. Lloyd George made another departure from practice when he assumed responsibility for the health of workers and conditions of work in munition factories. In January, 1915, he appointed Mr. Seebohm Rowntree to advise on problems arising out of the employment of women as munition workers,[4] and his powers being confirmed by the Munitions of War (Amendment) Act,[5] a branch of the Ministry known as the Welfare Department developed which was specially concerned to improve the conditions under which women and boys worked in Government factories, in controlled establishments, and in factories where a leaving certificate was required by employees.

Though the Minister was empowered to order firms to appoint welfare superintendents, these compulsory powers were not exercised, the policy of the Ministry being "to educate rather than compel."[6] The work of the department expanded rapidly; the supervision of working conditions and housing accommodation, and the provision of good food at a low cost and of facilities for recreation, improved the efficiency of the workers, and the activities of the department will probably have a permanent effect on working conditions in factories employing women and boys.

---

[1] All through the spring Mr. Lloyd George was pressing for further dilution. Minister's meetings. (C.R. 4514.)

[2] *Parliamentary Debates* (1915), *H. of C.*, LXXII, 1196.

[3] See Vol. IV, Part I, Chapter IV, pp. 54–64, 70–75; Vol. V, Part II, pp. 1-7.

[4] *The Times*, 4 January, 1916.

[5] Vol. IV., Part I., Chapter IV., and Vol. IV., Part II., Chapter III., p. 84.

[6] Hist. Rec./H/346/1.

VIII. Reorganisation of Supply.

By the end of 1915 the lines upon which the Ministry was to develop had been laid down, and it had already assumed responsibilities with regard to the supply of labour, of raw materials, and of machinery which ultimately subjected nearly every industry in the country to some measure of State control.

(*a*) National Factories.

National factories were being built all over the country to supplement trade production of essential munitions. In addition to the National Shell Factories, new National Projectile Factories, together with new Filling Factories, under the direct control of the Ministry, were being built to provide ammunition for the heavy guns ordered as a result of the Boulogne Conference, and an experiment had been begun which resulted in the erection of scores of State-owned and managed factories engaged in the production of every variety of munitions of war.

The decision to build new national factories was a bold one, but Mr. Lloyd George anticipated great results from this policy. He expected to turn out shells and explosives at a lower price than that at which they were being obtained from private enterprise, and he hoped that there would be less trouble with labour, which would, he thought, be readier to dispense with restrictive practices when working in a national factory where there could be no suggestion of profit being made except for the nation. Events justified this expectation. After a year's working the Projectile Factories showed a saving over contract prices of £2,760,000, and the Shell Factories a saving of £584,736,[1] while the Explosives and Propellant Factories achieved results equally satisfactory, and laid down standards of economy in the use of raw material that were of the utmost value. In addition to re-introducing competition and keeping down prices, the national factories relieved the Ministry of part of its dependence on American supplies, which were costly and subject to the risk of loss at sea. From the labour point of view, they were undoubtedly successful. National factories led the way in dilution and set standards in the percentage of female and unskilled labour employed which could be used with advantage when pressing for further dilution in private workshops. Again, the collection of monthly costs of production from a large range of national factories varying in size or equipment afforded a sound basis for comparison, for checking contract prices and improving manufacturing methods.[1]

But the industrial activities of the Ministry of Munitions went far beyond the national factory experiment. Its control of raw materials and of machinery—the latter exercised through the Machine Tool Department—and the powers held in reserve under the Defence of the Realm Act, enabled it to interfere with the processes of manufacture in non-munitions industries in order to increase the output or economise the use of munitions materials.[2]

---

[1] For details see Vol. VIII, Part I.

[2] See Vol. VII., Part I.

(*b*) Control of Industry.

The Raw Materials Department had made arrangements to centralise the purchases of munitions materials required by the Allies and by the British Government, and a system of fixing maximum prices, at first by voluntary agreement with the trade and later by regulations issued under the Defence of the Realm Act, which was destined to great development later, had been adopted.[1]

Meanwhile, the competition of the Admiralty for labour and machinery, which became a formidable problem later on, was beginning to be felt, and the necessity of priority regulations to discriminate between the competing claims of munitions, shipbuilding, and private trade, and between various firms in the same industry, became apparent. Thus the control of the State upon industry tightened, and a graded system of permits and licences which postponed non-essential work to war work and placed the latter in different categories in order of urgency, was set up.[2]

The effects of State control of the munitions industry soon became visible in the introduction of economies in labour and material through the spread of mass production, in increased standardisation, and the increased sub-division of manufacturing processes, which allowed the employment of automatic machinery and of unskilled labour, and in the pooling of manufacturing skill and experience.[3]

The inexhaustible demand which gave manufacturers a secure market for the whole of their output led to some slackening of competition and to the deadening of trade rivalries, and in the case of weak firms to a diminution of individual effort. Ultimately, the fact that the Ministry had encouraged the formation of associations of manufacturers stimulated post-war combination among firms which had become accustomed to corporate action during the war.

(*c*) Speeding up Output.

The Ministry went through a very difficult time in the autumn of 1915. In August "a state of congestion bordering on chaos" was discovered at Woolwich; there were not enough primers and gaines to enable the shells to be made into complete rounds, T tubes were short, and filling capacity was inadequate. In September a series of prematures condemned the 80/44 fuses which were being relied upon to fuse a large part of the output of H.E. shell, and the position was complicated by the fact that Canada was delivering empty shell instead of the complete rounds that had been ordered. Mr. Lloyd George made some severe comments, and pressed for a better system of co-operation with Woolwich which would obviate these miscalculations and fix the responsibility for them.

The National Shell Factories were giving very poor deliveries, mainly owing to the shortage of gauges, and the National Projectile

---

[1] See Vol. VII, Parts II and III.

[2] See Vol. VII, Part I.

[3] For illustrations of this, see Vol. X, Parts III and IV.

Factories, which were then being built, were getting on very slowly, and Mr. John Hunter had to be specially appointed to hasten the work of construction. The progress of the new Filling Factories, upon which the realisation of the ammunition programme depended, was also disappointing, and Mr. Lloyd George had to make special efforts to hasten their erection. There was also great delay in getting deliveries of the machine tools which had been ordered in America and at home to equip the new factories.[1] Again, the quality of the shell that was being manufactured was not very satisfactory; the percentage of rejections was high and contrasted unfavourably with the normal average before the war. This was partly due to the employment of inexperienced firms, partly to defective steel and defective gauging, and partly to the difficulty of training inspectors rapidly enough to keep pace with the growing output of ammunition.[2]

In order to meet these difficulties, a system of personal visits to contractors was inaugurated.[3] Engineers on the staff of the Ministry visited factories which fell short in their deliveries and put an end to the slackness and bad management which were reported from many parts of the country.[4]

Another feature of the autumn of 1915 was the reorganisation of munitions supply in Canada and the United States.[5] When Mr. Lloyd George took office, the situation was very unsatisfactory. Very large orders had been placed in the United States, but deliveries were disappointing; transport and forwarding arrangements were in a chaotic state and the Inspection Department was understaffed and overworked. Orders had been placed in Canada on a smaller scale, but for political and financial reasons Mr. Lloyd George thought it desirable that as large a proportion as possible of the overseas orders should be given to Canada. The Shell Committee appointed in September, 1914, though successful in inducing Canadian manufacturers to take up shell work and in creating an industry which by the end of 1915 was the largest in the Dominion, had not sufficient administrative experience to organise production on a very large scale.

Mr. Lloyd George was convinced that a full use of the resources of both Canada and the United States was essential to the Allies and that these resources had not been fully exploited by existing organisations. While giving largely increased orders for heavy guns and ammunition in the United States and for the latter in Canada, he sent Mr. D. A. Thomas[6] on a mission to report on the causes that delayed production.[7]

---

[1] Minister's Meetings, 11, 18 January, 1916 (C.R. 4514).

[2] C.R. 4514.

[3] Mr. Lloyd George claimed that these efforts had resulted in much better deliveries on the old contracts, the deliveries on contracts for 18-pdr. H.E. shell bodies rising from 16 per cent. of the promises in May, when bulk output was just beginning, to 80 per cent. in October. (*Parliamentary Debates* (1915), *H. of C.*, LXX.)

[4] C.R. /4495. Minister's Meetings (C.R. 4514).

[5] See Vol. II, Parts II and III.

[6] Afterwards Lord Rhondda.

[7] August and September, 1915. 94/Gen. No. /329.

In the United States, Messrs. Morgan's appointment as purchasing agents, which was found to have worked well, was confirmed, and an organisation for watching deliveries and speeding up production was formed under General Pease. This was superseded in January, 1916, by a more elaborate organisation under Mr. E. W. Moir, which became an American branch of the Ministry of Munitions. Special attention was paid to the transport problem in order to lessen the congestion on the railways and at the ports, which was impeding the movement of shipping. In Canada, Mr. Lionel Hichens was appointed by Mr. Lloyd George to reorganise the existing machinery. The Shell Committee was dissolved and an Imperial Munitions Board was set up in November, 1915, which developed Canadian production of shells and steel and raw materials so vigorously that by the end of the war the value of the munitions supplied by Canada to the British army was almost equal to that of the munitions supplied by the United States.

(*d*) PREPARATIONS FOR THE BATTLE OF THE SOMME.

The deliveries of guns and ammunition gradually improved during the winter months, especially the deliveries of the lighter natures, owing to the increased production of the National Shell Factories, and in spite of fuse and gaine difficulties which held up supply in December and January, the surplus of deliveries over expenditure enabled a reserve to be accumulated in anticipation of the summer campaign. The fuse and gaine difficulties and the comparative failure of the H.E. shell as produced by the Ministry had one good effect—the transfer of the responsibility for design to the Ministry, and the reorganisation of the Ordnance Board on lines which ensured closer contact between design and supply.

During the early months of 1916, attention was concentrated on improving the quality of the ammunition and overcoming detonation difficulties with good results which appeared in the battle period that followed.[1] Home production of rifles increased rapidly, and the first American rifles arrived in March. Meanwhile new trench warfare weapons, the flame projector, and the Stokes mortar were being developed, and the tank was being evolved in secret. From 31 October onwards the supply of steel helmets began. The winter of 1915 saw, too, the first considerable experiments with the manufacture of gas shells of the lachrymatory type, and 10,000 cast-iron 4·5-in. shells filled with S.K. were despatched to France by the end of April, 1916. Lethal shells were not approved by the Cabinet until 28 July, but lachrymatory gas shell were being supplied on a considerable scale before the Battle of the Somme. From October, 1915, onwards, British troops had been supplied with smoke shells to screen attacks.

The winter, then, was a period of intense preparation at the Ministry, but every battle that was fought proved that the Boulogne Conference standard was an under-estimate and not an over-estimate, and Mr. Lloyd George poured scorn on the criticism that the Ministry was "over-doing it, over-ordering, over-building, over-producing."[2]

---

[1] Minister's Meetings, 18 January, 1916; 10 March, 1916 (C.R. 4514).
[2] *Parliamentary Debates* (1915), *H. of C.*, LXXVII, 117.

In spite of the great efforts that had been made, British production had not yet approached German and French production, and France was of the opinion that even her colossal efforts were inadequate. It was no secret that in the last great battle (at Loos) there was

> "a prodigious accumulation of ammunition. There is not a general who was in the battle who does not tell you that, with three times the quantity of ammunition, especially in the higher natures, they would have achieved twenty times the result."[1]
>
> "The place acquired by machinery in the arts of peace in the nineteenth century has been won by machinery in the grim art of war in the twentieth century. In no war ever fought in this world has the preponderance of machinery been so completely established."[2]

The standards set at Boulogne and revised at Loos were dwarfed by Verdun. The German attack began on 21 February, 1916, and it was not until the end of June, when the German lines were within 5 miles of Verdun, that the battle died down. The loss of life on both sides had been enormous. The expenditure of ammunition had passed all records, and Mr. Lloyd George drew the attention of his supply officers to the fact that new standards had been set, especially with regard to the expenditure of heavy shell, and that the supply of heavy howitzers and their ammunition was of the first importance.[3] By April heavy shell was being delivered from the Projectile Factories in small quantities, and as the chances of the British offensive, which was timed for the late summer, appeared to depend on an abundant supply of ammunition for heavy guns, every effort was made to hasten output. The munition workers gave up their Whitsuntide holidays, the factories making heavy shell worked Sundays as well as week-days, and a certain amount of heavy shell from experienced manufacturers was even released for filling without being inspected.

In order to relieve the German pressure on the French, the British took the offensive earlier than had been arranged for, and following a bombardment which began on 25 June the Battle of the Somme opened on 1 July. The battle lasted three months. On 26 September the enemy's line was broken between Bapaume, Combles and Péronne; 43 villages were captured, and the British line was advanced from Fricourt to Flers, a distance of 6 miles on a front of 6 miles; while 121 German guns and howitzers, 500 trench mortars and guns, and 11,000 prisoners were captured from the enemy.

This territorial advance was no adequate measure of the importance of the battle. It was the cause of the great German withdrawal in the spring of 1917, and was in Sir Douglas Haig's opinion one of the decisive battles of the war, the enemy's casualty list being the true measure of progress.

---

[1] *Parliamentary Debates* (1915), H. of C., LXXVII, 118.

[2] *Ibid.*, 96.

[3] Minister's Weekly Meetings, 5, 11, 18, 25 January, 2 March, 1916 (C.R. 4514).

From the munitions point of view the battle was distinguished by the enormous expenditure of ammunition, by the use of aircraft to attack troops on the field of battle, and by the appearance of the tanks on 15 September. During the whole battle period an average weight of 26,000 tons of shell was hurled at the enemy every week, and when the battle ended, " after four months of incessant bombardment night and day, there were more guns and there was more ammunition than on the first day the battle began."[1] The German reports on the battle (26 September) laid stress on the fact that the Anglo-French forces were " provided with a great mass of material prepared during many months by the war industry of the entire world."

IX. Mr. Lloyd George's Achievement.

The Battle of the Somme was a demonstration of the success of Mr. Lloyd George's achievement at the Ministry. But munitions supply at the Somme represented only the first fruits of the organisation he set up. Rifles, small arms ammunition and trench artillery and ammunition were being produced on a sufficient scale, but the supply of guns, gun ammunition, and machine guns had by no means reached its climax. The Projectile Factories and many of the Filling and Explosives Factories were then only beginning their work, and it was not until 1917 that they reached their maximum output, an output which in large measure is directly attributable to the courage and foresight which he exercised in elaborating the great productive organisation of the Ministry of Munitions. The progress made is clearly brought out by the following table of munitions deliveries :—

MUNITIONS DELIVERIES IN 1915, 1916, AND 1917.

	July to Sept. 1915.	*July to Sept.* 1916.	*July to Sept.* 1917.
GUNS AND HOWITZERS (number delivered to Service).			
Light	997	501	1,187
Medium	193	449	285
Heavy	—	256	370
Very heavy	16	134	234
Total	1,206	1,340	2,076
GUN AMMUNITION (number of rounds filled and completed).			
Light	1,680,400	11,229,500	13,170,800
Medium	407,300	4,011,100	5,055,400
Heavy	63,000	922,200	3,902,800
Very heavy	21,700	693,000	995,600
Total	2,172,400	16,855,800	23,124,600
TRENCH MORTARS (number accepted after proof).			
Light	93	1,094	799
Medium	59	124	786
Heavy	—	74	122
Total	152	1,292	1,707

[1] Mr. Lloyd George's speech at Carnarvon, 3 February, 1917.

MUNITIONS DELIVERIES IN 1915, 1916, AND 1917—(*cont.*).

	July to Sept. 1915.	*July to Sept.* 1916.	*July to Sept.* 1917.
TRENCH WARFARE AMMUNITION (number of rounds filled and completed).			
Grenades	2,355,076 ..	8,969,694 ..	7,668,206
Trench howitzer bombs.			
Light	39,790 ..	1,230,609 ..	1,337,320
Medium	41,893 ..	211,475 ..	363,730
Heavy	— ..	60,906 ..	64,913
Total	81,683	1,502,990	1,765,963
MACHINE GUNS (number accepted)	1,719 ..	9,572 ..	18,985
RIFLES (number accepted) ..	173,317 ..	457,732 ..	324,423
S.A.A. (number of rounds) ..	395,881,000 ..	807,639,000 ..	318,609,000

Thus, when Mr. Lloyd George left the Ministry the task of organising the production of guns and gun ammunition, of rifles and small arms ammunition, of trench ordnance and artillery on a scale which satisfied the needs of the army was fully accomplished; the provision of aircraft and aerial bombs, of tanks and munitions for chemical warfare on a similar scale was the work of his successors.

Lord Kitchener on whom had fallen the almost intolerable burden of responsibility for these supply services during the early months of the war, was the first to acknowledge the value of Mr. Lloyd George's achievement:—

> "You will realise what a relief it was to me when the Ministry of Munitions was formed and put under the able hand of the then Chancellor of the Exchequer. He and I have ever been in loyal co-operation, and from the day he took charge there has not been a single cause of friction between us."[1]

In his farewell to a department which he had entered with "a great deal of anxiety,"[2] Mr. Lloyd George reminded his hearers of his first day at the Ministry.

> "There was a table. I forget whether there were one or two chairs, but there was no carpet allowed by the Board of Works. That was not in the regulations. I believe I had a greater struggle over getting a carpet than I had over getting 50 millions for munitions. I said to Dr Addison: 'Look at that table! Do you see those two chairs?' 'Yes,' he said, 'what is the matter with them?' I said, 'Those are the Ministry of Munitions.'"

He showed how within a year the Ministry had grown by the exertions of "a body of picked men from every sphere of life . . . . every profession, the Civil Service, every trade and every industry in

[1] Address to Members of Parliament in so-called "secret session," 2 June, 1916.
[2] 1 August, 1916. HIST./REC. R/261/3; General Office Notice No. 26. 11 July, 1916.

England and the Colonies," and by hard work throughout the office from those at the top down to the "little girls bustling about the corridors carrying messages," into a department administering between 400 and 500 millions a year, a department which had quickened the industry of the country and inaugurated a new epoch in the productive economy of the British nation.

> "I have never seen a department work like it . . . . There was a cheerful activity; it was like an ant-heap, each one carrying a bigger load than himself, and carrying it successfully until at last this great structure was built up which has made its mark on the history of the country and on the history of the world."

Speaking in the House of Commons on 15 August, 1916, the new Minister of Munitions, Mr. Montagu, reviewed the work of his predecessor:—

> "The great lesson of the early part of the war was that munitions cannot be obtained merely by ordering. You have got to see that the man who takes your orders has the plant and the labour; you have got to follow up the work process by process; you have got to provide from the beginning to the end everything that is necessary. That is the cardinal principle of the Munitions Department. That is the lesson learned in the first months of the war, and it was this main conception with which my right hon. friend left the Treasury to build out of nothing the Munitions Department and the wonderful output I have described. Everything I have said of our success is a tribute to him. He chose the great leaders of industry who formed the pivots of our machine. He formulated the needs of the moment to labour, and persuaded them to agree to meet our necessities. He realised the scope which our operations should embrace in all the essentials of the production of munitions, and his tireless energy and vigorous personality were the inspiration of the whole vast fabric."[1]

---

[1] *Parliamentary Debates* (1916), H. of C., LXXXV, 1702.

CHAPTER III.

DEPARTMENTAL DEVELOPMENT UNDER MR. E. S. MONTAGU AND DR. C. ADDISON.

I. General Survey.

The second year of the Ministry of Munitions' existence, the third year of the War, covers the administration as Minister of Munitions, first, of Mr. E. S. Montagu (July–December, 1916), and then of Dr. C. Addison (December, 1916–July, 1917). These two brief administrations constitute together the "middle period" in the history of the Ministry. It was a period of continuous growth in every respect. Extensive new responsibilities were undertaken by the Ministry, including the supply of railway material, motor transport, agricultural machinery, and aeroplanes. The output of all kinds of munitions was multiplied. Increased supply was accompanied by improved quality; and before he left the Ministry Dr. Addison was able to quote Sir Douglas Haig's generous appreciation of the success of the Ministry in this particular.[1] Augmented output led to increasing stringency of raw materials, and some of the most important work of the year was done in connection with the control of metals—the primary object being economy of consumption, especially of imported metals such as copper, and increase of output, particularly that of British-made steel. As regards labour, the conflicting claims of the Army and of munitions production upon the diminishing supply of man power, together with the necessity of satisfying the claims of labour itself, formed a subject of almost continuous negotiation, resulting in a series of provisional solutions. A new basis for protection from recruiting was found towards the close of 1916 in the form of the Trade Card Scheme. This, however, broke down and was replaced by the Schedule of Protected Occupations. On the other hand, an attempt was made to extend the dilution of labour to men employed on private work. Before Dr. Addison left the Ministry the important Munitions of War (Amendment) Bill of 1917 had been drafted. Finally, the financial machinery of the Department was overhauled and strengthened. These achievements will be reviewed in greater detail below.

The period in question was marked by immense transformations in the wider history of the war, such as the Russian Revolution and the entry of the United States as a belligerent.

Special missions were sent from the Ministry, both to Russia and to America, in the early months of 1917. Lord Milner's Mission went to Russia in January and arranged with the Russian authorities a programme of munitions and materials to be supplied by the

[1] See below, p. 55.

Allies. After the revolution a second mission, under Colonel Byrne, was sent out to facilitate the transport of these munitions and materials from the ports to the front or the factories. After the United States had declared war, representatives of the Ministry accompanied Mr. Balfour to America to discuss with American officials the best methods by which each country could assist the other with essential munitions. As the variety of agencies of the Ministry in America grew, the whole organisation was, in June, 1917, placed under the direction of Mr. (later Sir) Charles Gordon, Vice-Chairman of the Canadian Munitions Board, Lord Northcliffe having by this time succeeded Mr. Balfour as principal representative of the British Government in America.

The general conduct of the business of the Ministry during this period is marked by a somewhat rapid increase in the number of important departments, each controlled by an independent Director-General,[1] thus continuing the general lines of administrative procedure adopted by Mr. Lloyd George. Co-ordination was therefore the watchword of administrative policy. As Mr. Montagu said to his Heads of Departments :—

> " The first consideration is now no longer a desire to harness energy and speed in developing the sources of production ; what we have now to do is to consider the best use to make of our mobilised resources. The disadvantage of mobilisation is that when you have mobilised what you have got there is less to be mobilised in future, and although I have not the slightest doubt that we are in a better position than any other country in the world, enemy or ally, yet the fact remains that, both in material and man power, the more we do, the shorter we become, and our chief aim, if we are going to husband these resources, ought to be to act collectively, so that there shall be no overlapping, as little competition as possible, and as high a degree of economy of the common services as possible in our desire to supply all we can for the Allies' and our own cause."[2]

Mr. Montagu instituted and Dr. Addison continued fortnightly Meetings of Heads of Departments. These meetings afforded a valuable means of securing community of action and concentration of effort throughout the numerous and scattered branches of the department. On laying down his office Dr. Addison said : " The discussions which have taken place at some of the meetings in this room have laid the foundations of some of the most important departures in policy and in the undertaking of supply that the Ministry has been responsible for." A more important innovation was made when Mr. Montagu set up an Advisory Committee to investigate questions referred to it by himself or the Parliamentary Secretaries. Mr. (later Sir Arthur) Duckham and Mr. (later Sir

[1] This development was reflected in the growth of the headquarters' staff from 5,000 to 12,000. See Appendix IV.

[2] Meeting with Heads of Departments, 12 October, 1916. (HIST. REC. R/263/5.)

James) Stevenson, as Chairman and Vice-Chairman, were relieved of departmental duties to devote their whole time to the committee. The other members, Sir Frederick Black, Sir Ernest Moir, Mr. (later Sir Stephenson) Kent, Mr. (later Sir Hardman) Lever, and Sir Alexander Roger were heads of departments. In defining the position of the Advisory Committee, Mr. Montagu said[1]: "It is in no way executive. It does not absolve me from any responsibility for the affairs of the Ministry. It does not stand between the executive officers of the Ministry and Dr. Addison, Mr. Primrose,[2] and myself. It does not cut across the organisation of the office or interfere with the ordinary procedure of reference of administrative questions from the heads of branches through the heads of departments to the Minister. No officer's responsibility for his work is in the least degree affected by its existence." To this committee the consideration of the very large gun ammunition programme for 1917 was referred in October, 1916; the munitions supply programme was considered as a whole and plans for meeting an unprecedented demand were made, based on the opinions of all the departments concerned. During the ensuing nine months many important new departures in departmental organisation, such as the taking over of aeronautical supplies, were carried through in accordance with plans elaborated by the Advisory Committee.

II. The Work of the Ministry.

Speaking in the House of Commons on 28 June, 1917, Dr. Addison surveyed the work of the Ministry of Munitions. He passed in review the principal departments embraced in that great organisation and voiced his appreciation of the achievements of the many eminent men, who, as heads of their respective branches, had successfully undertaken tremendous responsibilities, had surmounted difficulties which had seemed well nigh insuperable, or had made original contributions in the application of scientific methods and the discovery of new industrial processes. The story he told was:—

> "A story of disappointments many, of difficulties manifold and often unexpected, of expedients without end, and of the resolute determination by which those difficulties were steadily overcome; a story of improvisations gradually leading up to the formation of an organisation which, assuming or having forced upon it first this function and then that, became at last as prodigious in its proportions as in its output of munitions; a story of the courage and uncanny insight of Mr. Lloyd George, of the labours of a band of helpers of a unique and splendid character, and of the untiring and patriotic efforts of men and women, employers and employed, who by their collective efforts have provided an imperishable tribute to British genius and resource."

---

[1] Meeting with Heads of Departments, 12 October, 1916 (HIST. REC./R/263/5).

[2] Major the Hon. Neil Primrose, M.P., occupied the position of Parliamentary Secretary to the Ministry of Munitions from 12 September–14 December, 1916.

The catalogue of departments whose heads were thus signalised and whose successful work received honourable mention was a long one. Some may be recapitulated here.[1]

Lord Moulton had been in charge of the *Explosives Supply Department* ever since its establishment in January, 1915, and had applied his unrivalled knowledge and skill to devising means for procuring an adequate supply of high explosives materials. The vast new factories at Queensferry, Gretna, and elsewhere had been designed, equipped and developed by the genius of Mr. Quinan, an American engineer. These factories "were erected at such a pace that what were untouched green fields one year were the sites a year later of great establishments capable of dealing with the raw materials of minerals or cotton, and of working them up into finished explosives every week." Sir Keith Price, the Deputy Director-General, was primarily responsible for co-ordinating the work of the great chemical trades and developing the supply of essential materials from home and foreign sources.

The scheme of *Area Organisation*, devised by Sir James Stevenson, had come into operation, and the National Shell Factories, administered by local Boards of Management, as well as the infinite number of contracts placed locally through the medium of Co-operative Groups of firms, were in full bearing, yielding together one-quarter of the aggregate shell output.

Shell Manufacture as a whole was in the charge of Sir Glynn West, who, as chief expert of Messrs. Armstrong & Whitworth, had been called in by the War Office to supervise the organisation of the engineering industry and who, starting from small beginnings, had built up a vast organisation for the satisfaction of this most urgent of all requirements. In particular, the demand for heavy shell of all kinds, the production of which could not be undertaken by firms of restricted resources, was now being met by the output of the great new arsenals known as National Projectile Factories, for the supervision of which Sir Glynn West was responsible.

Sir Eric Geddes, later succeeded by Colonel Milman, had in January, 1916, taken over from Sir Glynn West the control of the *Gun Ammunition Filling Department.* This department administered the National Filling Factories, which were then approaching the point at which they could assume the task of loading and completing the shell bodies and components now coming forward in great numbers. The moment was critical and the difficulties endless. By means of sound organisation, built up after careful preparations, the task was accomplished ; not only was output developed, but the cost of filling was reduced by 40 per cent.

The principal overseas agency for supplementing the resources of home manufacture was the *Imperial Munitions Board* of Canada, under the chairmanship of Sir Joseph Flavelle. The Board employed more than 200,000 workpeople, and their supplies, which covered almost the whole field of munitions, were specially important by reason of the large production of shell and completed ammunition.

[1] For further particulars see Chapter V.

Mr. (later Sir Charles) Gordon, who had acted as Vice-Chairman to the Board, was placed in charge of the *Munitions Organisation in the United States*, which had originally been controlled, so far as purchase was concerned, by Messrs. Morgan. There had also been established in London an *Inter-Allied Bureau* for the purpose of pooling the requirements in the American market of all the European Allies, and thus economising purchase and distribution.

The growth of output involved an immense augmentation of the work of the *Inspection Department*, the British staff of which had grown from 8,700 when the Ministry was formed to 40,000 in 1917, together with 8,000 in the United States. The supervision of this development was the work of Sir Sothern Holland and Sir Ross Skinner.

General Bingham, as concerned with *Design and Approval*, was primarily responsible for the effective collaboration established between the staffs of the Design, Inspection, Shell Manufacture and Filling Departments, and also for developing the expert experience of those engaged in manufacture.

The Munitions Inventions Department, in the charge of Colonel Goold Adams, had dealt with a steady stream of suggestions. More than 6,000 had been reported on in six months, and many valuable innovations had resulted. The work of the Nitrogen Products Committee, under the chairmanship of Colonel Goold Adams, was of special significance. Somewhat analogous in its object of diminishing the need for importation was the endeavour to develop the production of oil from British sources organised by Professor Cadman.

Priority of reference has been given to the supply of gun ammunition which occupied the place of primary importance, both because of its vital significance in the campaign and also by reason of the vast bulk and costliness of the output. But the achievements to be recorded are not limited to this form of supply.

Thus to Sir Charles Ellis and Colonel Symon belongs the credit for having successfully confronted the difficulties inherent in the development of *Gun Manufacture*, a form of production highly specialised in its requirements of technical skill and equipment.

Under Mr. Alexander Duckham the output of *Machine Guns and Rifles* had been fully equal to the demand, while the country had become self-sufficing in the matter of *Small Arms Ammunition*. Thanks to the energy of Colonel Stern and his collaborators the new designs of *Tanks* were coming forward and further developments were promised.

The Trench Warfare Supply and Research Departments, under Sir Alexander Roger and General Jackson, respectively, were evolving and developing the supply of a multitude of new munitions and appliances, including trench mortars and ammunition, grenades, fireworks, chemical apparatus, steel helmets, and body armour.

The Optical Munitions Department was charged with responsibility for the supply of scientific instruments, gun sights, apparatus for

aeroplane photography and for telegraphic work, and in addition for the provision of certain forms of scientific and commercial glassware. Under the untiring administration of Mr. Esslemont, and as the result of the scientific researches of Professor Jackson and Mr. Cheshire, a whole group of industries had been placed on a secure foundation, and the reproach of national dependence upon foreign, and hostile, sources of supply had been removed.

Under the guidance of Mr. (later Sir Alfred) Herbert, the *Machine Tool Department* had successfully organised the supply of every variety of workshop equipment from the smallest tools to the mightiest cranes. *A Machine Tool Clearing House*, under Captain Kelly, had also been set up to investigate the supply of idle, or insufficiently used, machinery.

The Steel Department, under the leadership of Mr. (afterwards Sir) John Hunter, was striving to increase output by developing the supply of home ores and the manufacture of basic steel. *The Non-Ferrous Metals Department*, under Mr. (later Sir) Leonard Llewellyn, was responsible for a large volume of varied supplies, including spelter, aluminium, copper, tungsten, brass, lead, nickel, and other metals. The control of these essential materials involved a careful system of allocation and rationing, and the constant endeavour to substitute more for less available supplies. Economy in use was further promoted by the activities of a *Scrap Metals Branch*, under Mr. (later Sir Alexander) Walker; while Sir Lionel Phillips had undertaken the chairmanship of an expert committee charged with responsibility for stimulating the development on commercial lines of the mineral resources of the United Kingdom. Meanwhile, Mr. (later Sir) Edgar Jones, M.P., was continuing, as Controller of the large *Priority Department*, to extend the well-nigh universal scope of the systematic control imposed upon the user of industrial materials in the national interest.

The principal departments so far enumerated dealt with supplies for which the Ministry of Munitions had been responsible since its inception. But between August, 1916, when Mr. Lloyd George left the Ministry, and July, 1917, when Mr. Churchill became Minister, the responsibilities of the department were extended to cover a number of extremely important supplies, including aircraft, mechanical transport vehicles, railway materials, and agricultural machinery. Though latest in order of sequence these departments were by no means last in order of importance. The industrial characteristic of this allied group of supplies lay in the fact that they all involved the use of steam or internal combustion engines. The trades concerned were thus subject to mutual interaction, and it was found advisable to concentrate the control in the hands of a single department in order to avoid the inconvenience of conflicting or competitive demands.

The Mechanical Transport Department had been transferred from the War Office and established under Sir Albert Stanley and Colonel Holden. An *Agricultural Machinery Branch* was set up under Mr. Edge to carry out the large programme of supplies put forward by the Food Production Department. *The Railway Materials Branch*, under

Sir Ernest Moir and Mr. Allen, was created to meet the urgent requirements of the Army, both for track and accessories and for rolling stock, involving the urgent assemblage of available supplies from all parts of the Empire. Mr. Percy Martin was appointed Controller of *Petrol Engine Supplies;* and Sir William (later Lord) Weir, who had served the Ministry as Director of Munitions for Scotland, was entrusted with the organisation of a new *Aircraft Production Department* for securing a greatly extended output of aeroplanes and seaplanes. Both Sir William Weir and Mr. Martin became members of the Air Board, which body undertook the formulation of programmes for the United Air Service.

The work of the Finance Department and the Labour Supply Department are dealt with in detail below ; and space will not permit reference to the many ancillary sections of the Ministry which dealt with activities less directly associated with its main functions, but which were none the less essential to its smooth working. Among these we may only mention the labours of the Health of Munitions Workers Committee ; the work of the welfare supervisors ; the successful campaign for combating T.N.T. poisoning ; the provision of housing accommodation ; the handling of industrial disputes. These and many other labours were carried on under the Minister's charge and responsibility. Dr. Addison did not undervalue the services of those who worked with him under the inspiration of a great national purpose and enthusiasm. He spoke of them as " perhaps the most remarkable aggregation of men and women of diverse qualifications and attainments that has ever been got together in this country."

III. Growth of Output and Improvement in Quality of Munitions.

On 15 August, 1916, shortly after taking up his work as Minister of Munitions, Mr. Montagu reviewed the achievements of the Ministry of Munitions up to that time.[1] On 28 June, 1917, less than a month before leaving the Ministry, Dr. Addison recorded the results of a further ten months of progress, and Mr. Montagu, not yet Secretary of State for India and outside the Government, replied. Both ministerial speeches were largely devoted to statistics of output " by which first and foremost," said Mr. Montagu, " the House and the nation will ultimately judge the Ministry."[2]

(*a*) Guns, Small Arms and Ammunition.

The manufacture of shell bodies and components and the production of finished ammunition constituted far the largest item in the Ministry programme, and had, indeed, been at first the *raison d'être* of the Ministry. Mr. Montagu compared the output in August, 1916, with that of the first year of the war. By way of illustration of the astonishing increase, he pointed out that the whole product of the first year could now be attained, from home sources alone,

[1] *Parliamentary Debates* (1916), *H. of C.*, LXXXV, 1678–1705.
[2] *Parliamentary Debates* (1917), *H. of C.*, XCV, 558–597.

" for 18-pdr. ammunition in three weeks ; for field howitzer ammunition in two weeks ; for medium-sized shell in eleven days ; and for heavy shell in four days." Taking together all natures of gun and howitzer ammunition, there was now being manufactured and issued to France every week about as much as the whole pre-war stock of land service ammunition in the country. When Dr. Addison spoke ten months later, further important developments could be recorded. The great National Projectile Factories for the production of the heavier natures of shell had now come into full operation, with two results : the output of shell bodies and fuses, which in 1916 lagged behind, had now outrun the supply of guns, and it had become possible to divert certain shell factories to cope with the formidable increased demand for repair of worn guns.

Shortly before Dr. Addison left the Ministry the gun ammunition programme for 1918 was formulated.[1] The supply of ammunition was to be maintained for the whole year at the rate per gun per day put forward the previous September for the 1917 programme, though the number of guns was to be increased by one-quarter. As with former programmes, large orders for shell had to be allocated to Canada and the United States in order to preserve home steel for shipbuilding purposes. It was anticipated that the increased quantity of ammunition could be provided with approximately the same manufacturing output and the same scale of importation as in 1917. The estimated output would just about cover the expenditure during the summer fighting season with a small margin. Therefore, if output was maintained at the maximum rate throughout the winter months when expenditure was lower, a sufficient stock of completed ammunition would be accumulated to allow expenditure during 1918 to be raised 40 per cent. above the 1917 level.

The increase of output of ammunition during Mr. Montagu's and Dr. Addison's tenure of office may be summarised as follows. If the figure 1 is taken to represent the weight of weekly output of ammunition at the time of the formation of the Ministry, the following figures indicate the increase recorded : July, 1915, 1 ; July, 1916, 10 ; December, 1916, 15½ ; July, 1917, 26.

As regards improvement in quality during the year 1916–17, the witness of the user is the best evidence. General Tudor, commanding the artillery of the 9th Scottish Division, wrote to the Master-General of the Ordnance in April, 1917 : " The heavy ammunition is a refreshing change from the Somme brand."[2] The testimony of the Commander-in-Chief may be cited in evidence of the success which attended the " prolonged experiments and tedious trials " conducted by the Design Department under General Bingham, and " the increased expertness and careful collaboration of the staffs of the Design Inspection, Supply, and Filling Departments, as well as the growing expert experience of those concerned with manufacture."

[1] HIST. REC./R/1000/116.
[2] Meeting of Heads of Departments, 11 April, 1917 (HIST. REC./R/263/5).

On 25 April, 1917, Sir Douglas Haig wrote to the Army Council :—

> "I have the honour to bring to the notice of the Army Council the extremely good performance of our artillery material including guns, howitzers and ammunition during the recent heavy fighting. . . . All natures of equipment have stood the strain of prolonged firing most satisfactorily and the number of guns and howitzers out of action at any one time has been very small. No defects of serious importance have come to light. The ammunition has also been satisfactory. Detonations have been good, blinds few, and prematures, though not entirely eliminated, have shown a most satisfactory reduction in proportion to the number of rounds fired. The actual number of prematures in the 18-pdr. gun during the period 1 to 15 April was four, which worked out at one premature to every 317,000 rounds of H.E. fired. During last December the proportion was one in every 19,000 rounds. The corresponding figures for the 4·5-in. howitzer during the same period is seven prematures, or one in 106,000 rounds. In January last the proportion was one in 18,000 rounds. The new 106 fuse has proved most valuable, and by its action when used against wire has contributed in no small degree to the success of the operations."

As regards guns, Mr. Montagu was able to show in August, 1916, that the monthly output during the past year had increased threefold in the case of 4·5-in. howitzers and sixfold as regarded heavy guns. The establishment of 18-pdrs. was practically complete. During the following year, however, manufacturing resources were strained to the utmost by the rapid rate of wastage caused by the increased abundance of ammunition, by the demands of the Allies (guns of British manufacture were to be found on both the Russian and Italian fronts), and by demands for guns for anti-aircraft purposes and for the arming of merchant ships against submarines. The assistance given by shell factories in gun repair has already been mentioned. When in 1917 the War Office demanded for 1918 an increase of 25 per cent. in all calibres of guns, the Ministry, while unable to guarantee this percentage in all calibres, anticipated a very substantial all-round increase.

As regards machine guns, rifles, and small arms ammunition, the crisis had already passed before Mr. Lloyd George left the Ministry. Already, when Mr. Montagu made his speech of 15 August, 1916, he was able to state that the weekly output of machine guns had increased fourteenfold in a year, and that the supply of rifles was no longer a limiting factor on the numbers of our armies in the field. In both rifles and machine guns the Army was wholly equipped from home sources.

(*b*) Trench Warfare and Tanks.

There were important developments, however, as regards certain novel stores supplied by the Trench Warfare Department, especially in connection with aerial bombs and fireworks and apparatus for the

discharge of gas. An achievement of considerable significance to the Army was the fact that one and a half million steel helmets were supplied during the first six months of 1917. No experimental store was more urgently demanded by the Army and more carefully investigated in the Ministry during this year than smoke shell, and by May, 1917, the Master-General of the Ordnance was able to show Dr. Addison a letter from a divisional artillery general in France saying: "We find the 18-pdr. smoke shell splendid for the close barrage, and the 4·5-in. guns will be used for a distant smoke barrage to prevent the enemy seeing the others."[1]

Tanks did not see service until two months after Mr. Montagu became Minister. The first machines took the field in the Battle of the Somme on 15 September, 1916. Throughout the winter the supply of tanks was retarded by defects revealed in the original design, but in April, 1917, the type known as Mark IV, with greatly improved track-rollers, began to be supplied, and in this and the three following months nearly 500 Mark IV tanks were delivered by the manufacturers. This was the tank which went into action at the Battle of Cambrai on 20 November, 1917, when, without artillery preparation, they advanced over the Hindenburg line, and "proved that with good training and with a proper combination with the infantry the enemy lines could be broken without the artillery preparation that had hitherto been found absolutely necessary. In fact, the Battle of Cambrai opened an entirely new phase of warfare."[2]

(*c*) Railway Material.

In October, 1916, a new departure was taken when the responsibility for the supply of railway material for the armies in the field was finally taken over and entrusted to Sir Ernest Moir. The position presented immense difficulties, owing to the pressure of demands on the steel supply both for munitions and for shipbuilding. As was stated by the head of the Steel Department at the meeting of Heads of Departments on 27 November, 1916: "Sir Ernest wants 150,000 tons for rails at the front and he can't get any of it."[3] The supply of the home railways was already dangerously depleted, and the extreme suggestion was mooted of reducing all Irish railways to single lines. By March, 1917, the steel position had begun to improve, but the lack of railway transport in England was the main limiting factor on the output of the steel required for increasing railway transport both in England and in France—a vicious circle.[4] At the same time the Master-General of the Ordnance, just returned from France, reported that transport was the "bottle-neck" of supply there also. Three months later, Dr. Addison was able to say:—

> "The other day Sir Douglas Haig paid a high tribute to the work of military transportation. There are few more

[1] Meeting with Heads of Departments, 11 April, 1917 (Hist. Rec./R/263/5).

[2] Sir E. Tennyson d'Eyncourt, 10 September, 1919 (Hist. Rec./R/1940/34).

[3] Meeting of Heads of Departments, 27 November, 1916 (Hist. Rec./R/263/5).

[4] Meeting of Heads of Departments, 13 March, 1917 (Hist. Rec./R/263/5).

thrilling stories in the history of the Ministry than that of how Sir Ernest Moir and his colleagues succeeded in a short time in meeting the enormous demand. The number of locomotives and trucks, with the track required, was so great that to manufacture all in time—even if there had been the raw material to spare, which there was not—would have been an impossibility. We had, therefore, to obtain the balance from existing stock where we could. Track was pulled up at home. India, Australia, and Canada sent their contributions. The Government of Canada held a meeting and within forty-eight hours had arranged, if we wanted it, to pull up 800 miles of track and ship it complete. More than 2,000 miles of track have already been supplied in a complete condition and nearly 1,000 locomotives of different kinds, apart from hundreds supplied by the Railway Executive Committee."[1]

(*d*) AIRCRAFT PRODUCTION.

More important still was the transfer to the Ministry of responsibility for the supply of aeroplanes and seaplanes for the Army and Navy (January, 1917). This was, in fact, the largest single extension of the scope of the Ministry's duties since its inception in 1915. The Aircraft Department of the Ministry at the time of the Armistice had nearly as large a headquarters staff as that of the whole Ministry at the date when Mr. Montagu took it over. The combination of military and naval manufacturing organisations under one head also marks a definite stage in the evolution of a single air force under an Air Ministry out of the separate organisation of the R.N.A.S. and the R.F.C. The transfer of aeronautical supply to the Ministry had been proposed by Sir William Weir in a memorandum[2] to Mr. Lloyd George as far back as May, 1916, but the reasons for such a change became more and more urgent as the year advanced owing to the increasing shortage of petrol engines. These internal combustion engines were not only required to meet the rapid growth of the air programme, but also for the now greatly extended output of motor transport vehicles, a situation which created an inevitable conflict of priority claims between the Government Departments concerned. If the natural reluctance of the fighting services to entrust to a civilian department the supply of so highly technical an article could be overcome, there was everything to be said for drawing together all petrol engine using departments (aeroplanes, tanks, motor transport, and agricultural machinery) under a single Department of State.

On 8 September, 1916, Mr. Montagu laid the proposal before the War Committee.[3] "Time and time again," the memorandum states, "the Ministry has been told that certain munitions require such high skill that only certain firms of long experience can undertake the supply, and time and time again the Ministry, through the magnificent response of engineering firms of all classes, has disproved the

[1] *British Workshops and the War* (HIST. REC./R/160/14).
[2] HIST. REC./R/1960/4.
[3] A.C. 14

statement." The case of gauges was adduced as an outstanding example of this. Ultimately the War Committee accepted the principle of the transfer and the Ministry was requested to elaborate a scheme in detail. Meanwhile the change of Government intervened and the scheme was accepted by Mr. Lloyd George's War Cabinet in January, 1917. The main features of the new organisation were :—

(i) The creation of an Air Board (later the Air Ministry) with executive power, controlling the general policy of the Air Services, together with experimental work, design, requirements, and final inspection.

(ii) The transfer of responsibility for the supply of aircraft required by the Air Board to an Aeronautical Supplies Department in the Ministry of Munitions.

(iii) The establishment of a Petrol Engine Department to control and extend output and allocate it between the engine-using departments.

(iv) The appointment of Sir William Weir and Mr. Percy Martin, Controllers of the Aeronautical Supplies and Petrol Engine Departments, as members of the Air Board, and of its Technical Committee.

The new organisation was some months in getting under way, and the vast increase in the output of aircraft belongs in the main to Mr. Churchill's period of office.

IV. The Supply of Materials.

(*a*) Iron and Steel.

Behind every successful achievement in output of munitions lay a struggle for labour and for materials, and in particular, steel. The man power problem will be dealt with in the next section : the present is concerned with the supply of materials.

Germany controlled, in her own and in conquered territory, a domestic steel supply considerably greater than that of any of the Allies before America came into the war. It was only the ability of the Allies to import shell and shell steel from neutral America and iron ore from neutral Spain that averted the decisive victory of the enemy. When, on 31 January, 1917, the German Chancellor (Dr. Bethmann Hollweg) announced the policy of unlimited submarine warfare, he gave as his first object the cutting off of British ore imports, putting this on the same level of importance as his other object, namely, depriving the country of food imports. The submarine campaign, of course, checked the import of iron ore. It also increased the demand for steel for shipbuilding and for the arming of merchant vessels, and made more difficult the problem of meeting the increasing requirements for munition and other purposes.

The output of steel ingots in this country, which stood at 7,835,000 tons in 1914, had increased to 8,978,000 in 1916, but by the end of that year, owing to shortage of labour and failure of imports, a most

serious crisis was threatened.[1] On 7 February, 1917, Mr. (later Sir John) Hunter, Controller of Iron and Steel Production, wrote to Sir Laming Worthington Evans, who had recently become Parliamentary Secretary: "I cannot express in words the serious position the country is in. The imports of ore are being reduced from day to day and furnaces are being affected accordingly. Next week it is impossible to say what will happen, but a lot of furnaces will be out of blast and iron and steel production will accordingly be reduced. In Spanish harbours we have vessels, loaded with 125,000 to 150,000 tons of ore, afraid to sail. I ask you to do all you can to get the Admiralty to convoy these ships. . . . If we do not get sufficient ore to keep us going, the war will certainly end and not as we wish it."[2]

The history of the following six months is the history of a great recovery based on the development of home resources. In spite of severe losses at sea, imports of Spanish ore were maintained, though they were not increased, averaging 520,000 tons monthly for the first six months of 1917 as compared with 748,000 (the maximum) in July, 1916. The shortage of foreign ore was indeed a continual source of anxiety down to the end of Dr. Addison's ministry. In spite of this, the output of steel was increased, and on 28 June, 1917, Dr. Addison was able to boast:—

> "Before the war the output of steel in this country had been more or less stationary for some time at a little over seven million tons per annum. The output is now nearly ten million tons, and I shall be very much disappointed if, with the schemes which are now being worked at, we have not reached the rate of a twelve million tons output by the end of next year. We shall then have gone far towards doubling the pre-war steel output of this country, and I need not emphasise all that is involved in this addition to our industrial strength and resources."[3]

The means by which the production of steel was increased are summarised in a report submitted by Mr. Hunter to Dr. Addison on 10 July, 1917.[4] The high content of phosphorus in home ores involved the provision of basic lined steel furnaces instead of the acid lined steel furnaces generally used; while, for use in basic furnaces, pig-iron had to be produced in blast furnaces of a suitable composition—low in silicon.

A number of blast furnaces which were idle through being out of date were put into operation on basic iron, some already in operation were changed over to basic iron, and new blast furnaces were built. A number of steel furnaces were altered from acid to basic linings, and others were built in order to provide for the conversion into steel of the pig-iron available from the additional blast furnaces.

---

[1] C.R. 4368.

[2] C.R. 4368.

[3] *British Workshops and the War* (Hist. Rec./R/160/14).

[4] C.R. 4368.

The results anticipated from this programme to 31 May, 1918, were as follows :—

	Tons per annum.
Estimated increase in output of basic steel	1,863,160 of basic steel.
To produce which will require, with the addition of 33⅓ per cent. steel scrap	1,288,891 basic pig-iron.
To produce which is required approximately	4,406,125 home iron ore.

In fine, the total increase of output of steel due to extensions since August, 1914, was estimated at 4,137,618 tons per annum, of which 1,863,160 tons could be got mainly from home ores, leaving 2,274,458 tons to be made from increased import of foreign ores.

(*b*) COPPER.

The copper situation was almost as serious as the steel situation. The United States was the only source of supply, and the British and French 1917 programmes as originally formulated demanded more copper than the total annual output of the United States. Production in the first place was not keeping pace with demands : speculation was rife, and in addition an entirely new factor arose through the competition, in the metal markets, of the controlled establishments.

During the early months of 1916 the Ministry had been able to steady markets somewhat by eliminating a certain amount of competition on the part of the Allies, and also by action taken at the request of the Ministry by the London Metal Exchange, but in the latter part of the year markets were affected by the increasing demands of the controlled establishments. When a firm had earned the standard amount of excess profits allowed under the Munitions of War Act, it was a matter of indifference to them what price they paid for material, as their sole concern then was to keep their works going. With that end in view they were always in the market prepared to overbid any offer. Indeed, there were cases in which they outbid even the Materials Department of the Ministry and forced up prices many points quite unnecessarily.

Faced with this situation and with the increased demand for brass under the new gun ammunition programme, the Ministry began, in the autumn of 1916, to consider taking over the control of copper and spelter. At a conference with the Director of Materials on 22 November, 1916, Sir Charles Fielding, chairman of the Rio Tinto Company, who, at the Minister's request, had accepted the chairmanship of an expert committee charged with the task of making recommendations for the conservation of the more expensive metals, expressed the opinion that even if there was enough copper both for the Ministry and the trade, it was very necessary that any surplus should be regulated by the Ministry.

> "There is enough copper for all purposes, and it is the manufacturers and not the demand that is forcing up the price. . . .

The only way in which the national interest can be protected is by regulating purchases through representatives appointed by the Ministry who will duly allow copper distribution for non-essential war trades after the needs of the Ministry for war purposes have been fully met. This course is the least of two evils. The Ministry must either control copper or else have the price put up to £200.[1]

The conclusions arrived at as the result of this conference were that—

(1) Copper should be put under Regulation 30A so as to prevent all dealing in the metal except by licence from the Ministry of Munitions.
(2) The Government should take over the control and supervision of all copper used in the United Kingdom.
(3) The allocation of all classes of copper should be effected by an individual or individuals, appointed by and attached to the Ministry of Munitions, who had an expert knowledge of the trade.

These proposals were sanctioned by the Minister, and on 8 December, 1916, an order for Government control on these lines was issued.

(c) Control of other Materials.

This order was followed during the subsequent months by similar orders controlling other munitions materials, and by the extended purchases of supplies on Government account for distribution to manufacturers. In this way the Ministry became the largest "shopkeeper" in the world. The policy adopted necessitated controlling the sale and purchase under a system of licences and the consequent rationing of civil industries, which involved an immense growth in the headquarters staff of the Ministry. In order to secure that the work should be carried out with a minimum of hardship to private traders, Dr. Addison appointed a standing committee of business men, the Priority Advisory Committee, under the chairmanship of Mr. John Wormald, of Messrs. Mather & Platt, to examine and advise upon various schemes of priority and rationing as they affected the various industries. On 28 June, 1917, Dr. Addison told the House of Commons: "The trades that have been examined cover a large number of industries, from the manufacture of washing machines to that of jewellery."

Some idea of the magnitude of the work involved by the adoption of the policy of control may be gathered from the remarks of Sir L. Worthington Evans in Parliament on 25 April, 1918:—[2]

> "The Ministry of Munitions is the biggest buying, importing, selling, manufacturing and distributing business in the world. That, of course, means nothing, because by itself it

[1] C.N.F.M.S./138a.
[2] *Parliamentary Debates* (1918), *H. of C.*, CV. 1182-3.

hardly describes even the quite simple operations which we have to carry through. We buy and import a very large quantity of raw materials—about £150,000,000 worth per year. There are, however, no world markets to-day in which you can buy those large quantities of raw materials. So that, although purchasing seems to be quite a simple operation, it means in our case that we have had to establish and maintain offices in the United States, Canada, Paris, and now in Rome. We have had to make arrangements for the control in our Dependencies and self-governing Dominions of the prices of raw materials, the restriction of their user, and the importation into this country of these raw materials. There are very obvious results from endeavouring to obtain raw materials where there are no international markets. Some of the steps we have had to take are the most unheard of and most unlikely steps. For example, in order to make sure of our lead supplies, in Spain we are actually financing the Carthagena and Herrerias Tramway, and in order to get lead from Spain we have had to provide it with coal. Again, in order to secure pyrites, we are having to subsidise freights and supply coal. . . . We have had to arrange for an Empire price to be fixed for wolfram. We are importing on Ministry account, and we have to ration it out to the smelters. We have to take the product and again ration that out to the various steel makers. All these operations are included in the business of buying and importing."

(*d*) Economy and Substitution.

The Ministry also tried to economise in the use of copper and brass. Speaking at the Fortnightly Meeting on 13 October, 1916, Dr. Addison raised the question why we needed copper bands on our shells 50 per cent. heavier than the French, and why we used 5½ lb. of brass to a particular fuse when the French only used a few ounces. The Design Department, however, attributed the longer life of our guns to the heavier copper bands, and Colonel Miller stated that the French 6-in. howitzer with the small copper band was only getting a range of 5,000 yards as against our 10,000 yards. Further, as regarded the life of the gun, it appeared that by adopting the simpler band with less copper in it the life of the 6-in. 20-cwt. howitzer had been reduced from 7,000 rounds to 3,000 rounds.

The matter was, however, submitted to renewed investigation, and Mr. Montagu appointed in November 1916, a Metals and Materials Economy Committee, with Mr. C. W. Fielding as chairman, composed of General Bingham, the head of the Design Department, and various engineering experts and heads of departments.

This Committee reported in December and recommended, *inter alia* :—[1]

(i) The alteration to a narrower type of the driving bands on projectiles for guns and howitzers.

---

[1] Hist. Rec./R/1800/40 and 41.

(ii) The substitution of steel or cast-iron for brass in various fuses.

(iii) The substitution of other materials for aluminium in Mills hand grenades, small arms bullet tips, crank cases, explosives, and smoke mixtures.

It was estimated that, on existing programmes, these modifications would result in a saving of 67,000 tons of copper, valued at over £8,000,000; a saving of 45,000 tons of spelter and 6,200 tons of aluminium.

The Committee also recommended the appointment of a Director of Scrap Metals, and Mr. Alexander Walker was appointed to this post.[1] Mr. Walker undertook, in co-operation with existing Scrap Sections, the collection of ferrous scrap, non-ferrous scrap, scrap wood, and salvage, created within the control of the Admiralty, the War Office, and the Ministry of Munitions; also scrap of all kinds dormant in commercial factories, private houses, and tin scrap in old dump heaps.[2]

(*e*) MINERAL OIL.

Another material the supply of which had to be supervised by the Ministry during Dr. Addison's tenure of office was petroleum. In January, 1917, a Petroleum Supplies Branch was formed under Mr. Houghton Fry[3] to deal with the Government scheme for the importation of mineral oils, supplies of kerosene and gas oil for general consumption, supplies of fuel oil for munition firms, the exportation of creosote and its use as fuel in this country, the supply of petroleum spirit for the use of munition firms, and the home production of petroleum and mineral oils from all possible sources of supply—from the ground, from shale, from coal, from gas works, and from coke ovens. The department was assisted in questions of home production by a Research Department under Sir Boverton Redwood, Bt.

V. The Problem of Man Power.

Speaking at his first Fortnightly Meeting of Heads of Departments on 12 October, 1916, Mr. Montagu said: "Representatives of the new Man Power Board have been to see me, and it is quite obvious that we are going to be challenged more and more by public opinion in this country to economise labour in order to set men free for the Army, while at the same time increasing our output—a very difficult and somewhat contradictory proposition."

Returning to the subject on 30 October, Mr. Montagu discussed the situation in detail:—[4]

> "There is an alarming shortage in the available supply of labour. . . . As regards the War Office and the general necessities of the war situation, we should not be doing our

---

[1] General Office Notice, No. 101.
[2] HIST. REC./R/1800/39.
[3] General Procedure Minute, No. 71.
[4] Meeting of Heads of Departments, 30 October, 1916 (HIST. REC./R/263/5).

duty as a Ministry unless we looked at the other side of the situation, and that is that there is an alarming shortage, which must grow greater as the campaign continues, of recruits for the Army, and we have to try somehow or other to harmonise these two considerations.

"Our shortage of labour cannot be repaired unless the War Office is willing to send back from the Front, as they have got to do in Germany and in France, specially desirable men who are now serving in the Line Regiments. The War Office have released large numbers of these men, but many more are still required. The numbers are not so great as the importance of the particular men. Our difficulties with regard to steel supply are enormously increased by the paramount necessity of returning at once a few score of silica brickmakers, who will I hope be available in a very short time. Almost every department has their own men whom they would like to bring back.

"At the same time we have got many men of military age available for general service working in our factories whom I think it ought to be our aim and ambition to get rid of at the earliest possible moment if we can possibly do without them. The ideal that we all ought to set before ourselves—an unattainable ideal, because there are all kinds of exceptions that have to be made—is that we should not employ anybody who is available for general service, let us say, under thirty years of age. As long as I remain at the Ministry I am going to resist any attempt to get rid of these men on our behalf; we must be allowed to do it ourselves, in relation to the output of munitions for which we are responsible. But if we are to be left alone, we have got to show ourselves willing to help to the best of our ability."

The Minister went on to remark that the men fell into three categories—skilled, semi-skilled, and unskilled. He thought that to free skilled men for general service in the Army was merely wasteful. At the same time there were constant allegations from the Press, the House of Commons, the tribunals, and the military representatives that there were men classed and badged as skilled men who were not entitled to be called skilled men at all.

"The trouble arises," he said, "from the extreme difficulty of finding a definition of skilled men. I do not believe that anyone has satisfactorily solved that problem. But, again, I think that we must be allowed to determine what we regard as skilled men who are working for us, and we must each do our utmost in the department for which we are directly responsible to make sure that no employer or contractor is claiming as a skilled man a man whom we are not thoroughly satisfied is skilled.

"When we come to semi-skilled and unskilled men, I think we ought to part with all of them who are fit for general service except in a category of trades that might easily be agreed upon. A man is little short of an idiot who thinks that he can man

> blast furnaces, steel works, rolling mills, and so forth entirely with women or with wounded soldiers or with octogenarians. We must have young, lusty, vigorous men—as vigorous as any in the trenches—and they have got to have, unless you are going to diminish output, a certain amount of experience, even though they are not classed as skilled men, in the functions that they are asked to perform. But if there are working in munition factories on shell turning or in explosives factories, men with no skill, or men who are only semi-skilled, and their work is work which could be done by older men or women, then I think it is our duty to insist, so far as we can, that the contractors and our own factories let them go at the earliest possible moment, and we have to try and find substitutes for them."

Dr. Addison indicated that the main reservoir for substitutes was non-essential civil industries at home, a fact which led in the course of the year, as will be described below, to an attempt to extend dilution to non-war work.

Mr. Lever pointed to another useful reserve of labour which might be set free by levelling up the efficiency of the Ministry's contractors and factories. For instance, 9·2-in. shell was costing £12 at one factory and £6 19s. at another, and the difference mainly represented wasted labour.

The first scheme for satisfying the claims of the Army on the one hand and the Ministry on the other led to unfortunate results. This was the Trade Card Scheme, which was agreed upon in November, 1916. The idea was to appease the anxieties of labour by throwing upon selected trade unions the responsibility for issuing certificates of exemption to skilled men. Twenty-five trade unions were empowered to issue to their members cards entitling the holders to exemption from military service. If the employers found that under this scheme essential men were called up owing to their not holding cards, they had a right of objection, and the man was not to be called up till his case had been gone into by a local committee consisting of a Ministry representative, a military officer, and a labour representative.[1] The same tribunal dealt with cases in which the military authority asserted that a holder of a card was not entitled to one.

In its working the scheme appears to have broken down along three lines. In the first place, many men were exempted on grounds of union membership who were not essential to munitions production from the point of view of the Ministry. Secondly, there were groups of skilled and essential workmen who, being in no trade union, obtained no cards of exemption. Sir William Weir instanced the magneto makers. He stated that on the very day he was speaking (2 February, 1917), 16 men were being taken for military service whose removal would completely arrest all deliveries of Rolls-Royce magnetos for aircraft.[2] Thirdly, the selection of 25 unions for the privilege of

[1] Meeting of Heads of Departments, 13 February, 1917 (Hist. Rec./R/263/5).
[2] Meeting of Heads of Departments, 13 February, 1917 (Hist. Rec./R/263/5).

issuing cards worked unfairly. On 15 February, 1917, Mr. Clynes and Mr. Thorne, President and Secretary of the National Union of General Workers, addressed a protest to the Minister of Munitions, the Secretary of State for War, and the Director-General of National Service.[1] They pointed out that several thousand general workers who were employed at skilled work as machine men on war work were being called up, whereas under the agreement entered into by the Government with certain other trade unions, workmen doing exactly the same work held exemption cards. They asked that all men should be treated alike, irrespective of trade union membership. Dr. Addison put this point of view strongly before his Heads of Departments a few days later, adding that he had been informed that a number of the unions were using their privileged position as issuers of exemption cards to recruit their membership at the expense of other unions not so privileged.[2]

Thus the Trade Card Scheme had to be abandoned. This was accomplished only after difficult negotiations with the privileged unions, especially with the A.S.E., who, however, agreed on 5 May. The withdrawal was accompanied by serious strikes (which, however, were largely attributable to other causes mentioned later) at Barrow, in the Rochdale district, and at Manchester, Sheffield, and Coventry.

Throughout the period under review the Army Council were of opinion that their difficulties could only be removed by simpler and more drastic methods.

On 28 November, 1916, the military members of the Army Council recommended a scheme for compulsory national service.[3] The War Committee of the Cabinet approved this scheme in principle and appointed a committee under the chairmanship of the Minister of Munitions (Mr. Montagu) to work out details, and placed it on record that they attached great importance to legislation before Christmas.

On 14 December, when Mr. Montagu's committee presented its scheme, Mr. Lloyd George's Government had succeeded Mr. Asquith's and the scheme was dropped. The new War Cabinet decided instead to appoint a Director-General of National Service (Mr. Neville Chamberlain) and a Minister of Labour (Mr. John Hodge), who should take over between them the functions then discharged by the Man Power Board.[4]

On 13 January, 1917, Mr. Chamberlain presented his First Report recommending that all men between the ages of 18 and 22 should be made available for military service. The War Cabinet decided (19 January) to accept this proposal, the so-called "clean cut," but to exempt from its operation men employed on steel production, those

---

[1] HIST. REC./R/1000/116.

[2] Meeting of Heads of Departments, 27 February, 1917 (HIST. REC./R/263/5).

[3] Memorandum by Adjutant-General (HIST. REC./R/1000/116).

[4] The following account is mainly based on a Review of the Man Power Problem prepared for the Cabinet in July, 1917 (HIST. REC./R/1000/116).

covered by the Trade Card Scheme, and men engaged in agriculture, mines and quarries, railway shops, transport works or shipyards. To cover the losses to the Army involved in these exemptions they ordered that by the end of January men fit for general service should be released as follows :—

30,000 from agriculture.
20,000 from mining.
50,000 from munitions.
A number not yet fixed from railways.

On 3 February Mr. Chamberlain reported that the number of men obtainable under the 18 to 22 scheme was now negligible, as all the fruitful sources of supply were excluded.[1] He proposed the abolition of all exemptions up to the age of 31 ; but the War Cabinet adhered to its previous decision.

On 13 February Dr. Addison called attention to the serious effect on output if the decision to release at once 50,000 general service men from munitions was carried out.[2] The War Cabinet, therefore, appointed a committee, consisting of Lord Derby, Lord Rhondda, Dr. Addison, Mr. Hodge, and Mr. N. Chamberlain, to consider the effect of the decisions taken and to inform Sir Douglas Haig. The maximum number of men for general service estimated to be obtained by the War Cabinet's decisions in respect of men between 18 and 22 was 50,000.

This committee reported on 21 March. They found that, to meet the needs of the Army Council during the four months from April to July, 330,000 men would have to be taken from protected industries. They considered that to take this number would endanger the supply of essential needs and recommended that only 250,000 should be released during the four months in question.

The Committee reported against industrial compulsion (with several dissentients), and against raising the age limit, as urged by the Army Council, on the ground that it was industrial compulsion in disguise. It recommended that the Trade Card Scheme should be superseded by a Schedule of Occupations, and that liability to military service should be extended to friendly aliens. The Committee proposed that the 250,000 men required should be obtained by quotas from various sources, 124,000 being badged men, and that shipbuilding should be excluded.

These proposals were in the main accepted by the War Cabinet, except that the Schedule of Protected Occupations was amended so as to give absolute protection to men engaged in shipbuilding and ship-repairing and marine engineering. This meant that the whole of the 124,000 badged men had to come from munitions, and Dr. Addison thought it might be impossible to release so many.

---

[1] Hist. Rec./R/1000/116.

[2] In fact, action on these lines was never taken, and, according to a Report of the Adjutant-General, only 12,000 men had been secured for the Army from munitions under this scheme by 20 May.

The Schedule of Occupations above referred to was in substance an agreement between the Admiralty, the War Office and the Ministry of Munitions on the subject of exemptions. The scheme was to supersede both the Trade Cards and all existing badges and certificates (except exemptions granted by tribunals).[1] The scheme provided for the scheduling of certain occupations. Outside these occupations all general service category "A" men engaged on Admiralty or munitions work who were below the age of 25 might be enlisted; while men in the scheduled occupations who were below the age indicated in the schedule for each occupation might also be enlisted at once or after the date specified. Semi-skilled and unskilled workmen below the age of 32 might still be enlisted unless they were exempted by the schedule.

The number of men to be released by the end of the first month from Admiralty and munitions work respectively was to be fixed at 25 per cent. of the total number due from the department. The release of these men depended upon effective substitutes being provided under the Director of National Service's scheme.

Unfortunately, protracted negotiations with the trade unions were found to be necessary before the new schedule could be put in operation, and a further amendment was found necessary, viz., that all male "diluted labour" should be taken away before any apprentices or skilled men engaged in munitions in any given area were recruited. The result of this pledge was to make it impossible to recruit any munitions workers except dilutees between the ages of 18 and 22. The schedule was limited to men under 32, and the dilutees between 32 and 41 formed a protective barrier to the apprentices and skilled men between 18 and 32. As a result, by the end of July, 1917, the period for which the calculations had been made (which was also approximately the date of Dr. Addison's departure from the Ministry), not more than 18,000 men had been released from munitions industries instead of 124,000.

One result of this was to undermine the position of the National Service Department. In a report, dated 22 June,[2] Mr. N. Chamberlain pointed out that, owing to the breakdown of the schedule scheme, his machinery for obtaining and allocating substitutes had come to nothing because, since the men had not been released, the substitutes would not be required. Mr. Chamberlain's conclusion was that all Class "A" men ought to be at the unfettered disposal of the military authorities; upon which Sir Stephenson Kent commented that Mr. Chamberlain's scheme would ruin output and occasion unrest "of so serious a character as to be more properly described as a revolution." The Ministry had, in fact, during May weathered a series of engineers' strikes which, though sporadic and showing a lack of both organisation and unanimity, caused temporarily a serious fall in output. The causes of these strikes were very variously estimated, but they were such as to make the Ministry chary of accepting "heroic" expedients for the solution of the man power problem.

[1] HIST. REC./R/1000/116. [2] HIST. REC./R/1000/116.

Two reports of the Ministry of Labour indicated the following causes as contributory to the strikes.[1]

(i) The prospect of the introduction of dilution in private industry, coupled with the discontent previously existing on account of the general restrictions on liberty entailed by the Munitions Act, such as the requirement of leaving certificates, the working of the munitions tribunals, and the abolition of the "right to strike."

(ii) The failure of Government Departments to keep the working men clearly informed of the meaning of new measures (such as the Schedule of Occupations), which it has been found imperative to introduce.

(iii) A suspicion that the trade union leaders had been "sold" to the Government, and the consequent rise to power of the Shops Stewards Committees, many of which consisted of mere agitators.

(iv) Alleged food profiteering—a conspicuous charge in labour papers.

(v) Peace talk, stimulated by the "No Annexations" announcement of the Russian Provisional Government (though the influence of this element on the strikes was, in the opinion of the report, exaggerated).

The Ministry had clearly no control over the last two of these causes of discontent, but with regard to (iii) the Ministry of Labour recommended the Ministry and employers generally to recognise elected committees and to go as far as possible in meeting the legitimate side of the movement, *i.e.*, to give the workman some voice in the regulation of matters affecting his employment.[2] They pointed out that some works committees had already been set up in national factories, directly representative of the workers and recognised by the trade unions concerned. These committees had all had good results, for when workmen knew that their committee would be treated seriously and sympathetically they chose responsible men in preference to self-seeking agitators.

With regard to (ii), Dr. Addison said at the Fortnightly Meeting on 6 June: "I feel that we had better start putting our case before the men, because up till now we have been so busy getting supplies that we really have not put our case forward. I feel that the fellows who have been making trouble have had all the innings. I have asked Mr. Glyn Jones, with others to assist him, to undertake a campaign of meetings to put our case before the workpeople so that those who are disposed to make trouble shall be confronted with the other side of the story. I blame myself for not having done that in an energetic form before, but the fact is, we were so busy that we did not think a publicity campaign was any part of our business."

---

[1] HIST. REC./R/1000/116.

[2] The Whitley Committee presented their Report shortly after this date.

With regard to (i), perhaps the fundamental cause of the strikes, before Dr. Addison left the Ministry, the Munitions of War Amendment Bill, 1917, had been drafted with the double object of opening up dilution on private work and of removing where possible those restrictions on liberty to which the Ministry of Labour had referred.

Dr. Addison expounded the Bill to a meeting of delegates of the A.S.E. on 13 July, 1917.[1]

After describing in general outline the immense and increasing demands made by the war on the nation's industrial resources, he said it had become imperative to obtain skilled men from private and commercial work without at the same time strangling the industries upon which the ordinary working life of the community depended. This involved the extension of dilution to private and commercial work, and the Bill, as drafted, contained the following provisions :—

(i) The extension of dilution to particular classes of work and particular establishments by declaring such work as "war work," by a three weeks' notice published in the Press. Any skilled man who moved under this arrangement from commercial to war work would be entitled to the privileges of war munition volunteers as regarded wages, and, if living away from his home, to the special allowance.

(ii) After the war, such workmen would have priority of work in their old firms over all except those who had joined the Colours.

(iii) In any place where dilution was proposed under these conditions, due notice of the proposed change must be given, and an agreement arrived at between the employer and a deputation of the workmen, registered in the Ministry of Labour, either party to be liable to prosecution on failure to carry it out.

(iv) The prohibition under the Munitions of War Act, 1915, of the right to strike was not to be extended to this class of case.

(v) Where non-union labour was employed in a controlled establishment on a class of work performed before the war by union labour, such non-union labour must be dispensed with at the end of the war, under a heavy penalty, namely, a fine not exceeding £5 per day for every man affected.

When the Bill was introduced the attempt to enforce dilution by legislation was abandoned. The rest of the Act dealt with the removal of objectionable points in the existing Munitions Act. In particular the leaving certificate system (Munitions of War Act, 1915, Clause 7) was abolished. In future a workman would be free to leave a

[1] HIST. REC./R/221.1/13.

munition firm and another firm free to engage him, subject to two provisos:—

(i) An employer engaged on private or commercial work could not take on such a workman without the consent of the Ministry.

(ii) To prevent "poaching," no employer engaged on munitions or other work could take on such a workman at rates higher than that paid to other employees doing the same work or higher than that workman himself had obtained at the firm he had left.

In concluding his exposition Dr. Addison said: "Peace and goodwill at home are essential to the prosecution of the war abroad, and I invite you to consider these far-reaching proposals as a whole. I am sure you will give them patriotic and friendly consideration and that you will not forget the overmastering national needs. You will recognise, I am sure, that the Government is prepared to do all that it can to meet objections and to protect your legitimate interests. You are entitled to that protection, for few men at home have made greater sacrifices than skilled workers in our munition factories."

VI. Financial Reorganisation.

By the reforms in the sphere of financial organisation Dr. Addison's administration marked a decisive epoch in the history of the Ministry of Munitions.[1] Two very burdensome tasks were undertaken, each of which occupied nearly the whole of the financial year 1917–1918. The first was the overhauling of all the past accounting transactions of the Ministry with a view to recovering the money that had been temporarily lost through the confusions and deficiencies of the earlier system of records. This bore fruit in recoveries to the amount of some £39,000,000.

The second was the reconstitution of the accounting system on a commercial basis for the future, by substituting double entry for the old single entry system in use before the war in nearly all Government Departments. Since the method of internal book-keeping was dictated by the prescribed form of accounts rendered to the Treasury and Parliament, this reform led incidentally to proposals for a remodelling of the public accounts themselves.

The achievement of these additional tasks involved an astonishing effort. At the end of 1916 the Accounts Department was already overwhelmed by its current work, the Ministry having become not only the largest buying concern in the world, but also, owing to the system of purchasing materials for resale to its contractors, the largest selling concern in the world as well. In 1917 the volume of work was still increasing and the difficulties of finding competent recruits for the

[1] A full account of these reforms will be found in Vol. III, Part I, Chapter III.

staff were certainly not growing less. To undertake in such circumstances the transformation of the whole accounting system, for the past as well as for the future, appears in the retrospect as a remarkable act of faith.

The urgent need for an internal audit of the Ministry's accounts was brought to light by the long delays that took place in charging contractors with material and components issued to them. The reconstitution of accounts which followed was undertaken by Mr. Guy and Mr. (later Sir Gilbert) Garnsey, acting under Mr. (later Sir) John Mann, who had been appointed Assistant Financial Secretary in succession to Mr. Lever. The general lines of their work may be indicated by quotations from a report presented on 12 July, 1917, after they had been engaged on this work for about three months.

> "The terms of reference to us asked us to 'assist in clearing up the position of the financial affairs of the Ministry.'[1] The breakdown of the Ministry's sales activities led us to concentrate on charges to contractors, with the progress which has been noted in our reports, in which we also included comments on such defects of method as were revealed in the course of this work. We feel, however, that the problem is too big to rely on remedies which may be suggested as an incident to the investigation of the contractors' personal accounts. We propose, therefore, to direct your attention to some matters which contain possibilities of danger unless they are more carefully controlled than at the present time.
>
> "In a well-conducted enterprise the management uses the accounts as an instrument of practical administration: the balance sheet, with relevant schedules, to examine the concern's status at any time and its employment of capital; and the earnings statements to examine its costs of operation. In Government accounting, the balance sheet was not much used, money spent being regarded as gone when it was charged to an appropriation account except as it might be represented in physical storage. Having no profit and loss, a substitute was supplied in the shape of departmental appropriations for the year's expenditure, the charges to which were carefully scrutinised and no excess allowed. For practical purposes, the central management was the Treasury, and this doubtless was satisfactory for peace time operations, when the creation of appropriation accounts was most carefully studied before expenditure was incurred, and when the bulk of expenditures were administrative.
>
> "The creation of a general Vote of Credit for the Ministry of Munitions removed the usual governmental form of control, and we gravely question whether any satisfactory substitute has been set up. Financial sanction has, no doubt, been secured at the initiation of each enterprise, but supervision over the conduct of operations seems to us partial and inadequate.

[1] HIST. REC./R/450/16(7).

The Treasury largely waived its control at the outbreak of the war, with the exception of salaries, but corresponding or better machinery should, of course, have been set up by the War Ministries themselves. We have considered how the Ministry of Munitions has met this elementary requirement, and we find the answer not at all satisfying."

The writers then drew attention to the items usually focussed in the balance sheet, which should reflect the Ministry's status at any given time and furnish a basis for inquiry and control of working capital. They illustrated their criticism as regards stores in hand, open accounts, liabilities and operations, and concluded with the words, "If it can possibly be done, the Ministry should prepare and use accounts that will give it a substantial central control over its departmental expenditures other than the piece-meal control of passing on individual contracts."

The work thus undertaken was carried on during Mr. Churchill's administration. When the system of double entry had been instituted for all current transactions, working up to a balance sheet and production statement, a special section was formed to reconstruct the whole of the Ministry's books on the same principle from the beginning of its operations to the date (31 March, 1918) when the new system came into full working order. It was estimated that this undertaking would, under the most favourable conditions, not be finished before the end of 1919.

VII. Reconstruction.

In spite of the pressure of more immediate problems, Dr. Addison found time to take a special and personal interest in questions of post-war reconstruction.

On 17 March, 1917, Dr. Addison addressed the following reference to the Advisory Committee :—[1]

"The time has now arrived at which I should be glad to have the advice of the Advisory Committee upon certain problems which are connected with the work of the Ministry of Munitions. As examples of these problems I may mention those which are related to—

(*a*) The cessation of our own work as a Ministry of Munitions.

(*b*) The steps which may be taken with manufacturers and contractors to bridge over the interval between the cessation of war and the establishment of normal conditions of industries, with the minimum of hardship both to employers and employed.

(*c*) The continuance in industry of methods and systems of organisation or work, or of methods of control of conditions of employment which the experience of the Ministry has shown to be advantageous.

[1] A.C./6.

(*d*) The fuller development of national resources so far as may be, assisted by the experience gained or the organisations set up by the Ministry of Munitions.

(*e*) The assisting in the establishment of new industries, whether conducted by or assisted by the State, or wholly under private management so far as assistance can be rendered by the experience gained, or by the staff of the Ministry.

(*f*) The establishment either of new or of modified industries as might arise out of the adaptation of factories or industries created or assisted by the Ministry.

(*g*) The financial relations and adjustments which it may be desirable to anticipate, or arrange for in advance, in connection with any of the matters above mentioned.

(*h*) In relation to the above, what services or assistance could be rendered by the Ministry of Munitions continued as a separate Ministry in any other form, or possibly merged in any other Government Department.

(*i*) The setting up in a more permanent form, for the assistance of the State, of the nucleus of an organisation, capable of expansion in the case of national emergency, which could provide war material.

(*j*) Whether any special organisation should be set up by the Ministry of Munitions whereby these questions could be more adequately examined or dealt with."

After considering this comprehensive reference the Advisory Committee recommended that a Special Reconstruction Department be constituted (administered by Sir Arthur Duckham and Sir James Stevenson) which would report to the existing Reconstruction Committee already formed by the Prime Minister. This department would collect information from the supply departments, which in turn would obtain the views of manufacturers, the Reconstruction Department suggesting lines of inquiry and acting as co-ordinators of the work in order to prevent overlapping.[1]

Action was taken on these lines and the Reconstruction Department constituted in April,[2] a detailed questionnaire being sent to all departments of the Ministry, to members of the Boards of Management Reconstruction Advisory Panel, and to the Boards of Management.

During the spring of 1917 Dr. Addison promised the Prime Minister that when the time came he would undertake charge of a Ministry of Reconstruction to consider reconstruction questions in their wider aspect and to co-ordinate the work done by various Government Departments, and on 22 July, 1917, the time came for this promise to be redeemed.[3]

---

[1] General Procedure Minute, No. 26.
[2] General Memorandum No. 2.
[3] Meeting of Heads of Departments, 18 July, 1917 (HIST. REC./R/263/5)

CHAPTER IV.

MR. CHURCHILL'S ADMINISTRATION—CO-ORDINATED EFFORT.

I. Introduction.

In July, 1917, when Mr. Churchill became Minister of Munitions, the military situation gave little hope of a speedy decision. The doctrine of the "limited offensive" prevailed on the western front, and from 20 March onwards the Allies had been making a series of attacks on different parts of the front, which resulted in the capture of the Vimy and Messines ridges and of many guns and prisoners, but at the cost of very heavy casualties. Meanwhile the eastern front was breaking up. The revolution in Russia had demoralised her armies, and the retreat, which began in July, threatened to liberate German troops and guns for the western front and to relieve the pressure of the blockade by opening up new resources to Germany.

America, which had declared war on 5 April, had as yet played no part in the struggle,[1] and the need of reinforcing the Allied armies to balance the loss of Russian help was pressing. A schedule of protected occupations replaced badges and trade cards, and in May a systematic combing out of munition works had begun.

The "unrestricted" submarine campaign launched on 1 February was still in its most threatening phase, and though the April losses, which amounted to 560,000 tons of British shipping, had not subsequently been equalled, the net reduction in the merchant fleet of Great Britain averaged 250,000 tons a month from February to July. The Admiralty was making great efforts to increase the output of new shipping—a total of 4,000,000 tons being aimed at for 1918—but progress was disappointing, and Germany was sinking Allied shipping much faster than it was being built. Thus, while tonnage and man power were shrinking, Mr. Churchill had to meet an increased demand for munitions and for steel for shipbuilding.

Mr. Churchill came to his new post with special advantages. He had been trained as a professional soldier, was a lifelong student of military affairs, and had had recent experience in command of an infantry battalion in France. His experience as First Lord of the Admiralty for three and a half years before and during the war had made him familiar with every aspect of Naval administration, and he had always advocated close co-operation between the Navy and

[1] American troops fired their first shot on 27 October, 1917.

Army. In particular he had taken a prominent part in the development of aircraft and the organisation of aerial squadrons, and in the provision of armoured car units, monitors, and other equipment required for amphibious warfare. He had, moreover, kept in close touch with the development of the Flanders campaign, and while First Lord had employed the available resources of the Navy to supplement the deficiencies in the equipment of the armies and in the supply of essential military material, such as cordite. Further, he had urged forward the preparation of naval weapons and supplies of an experimental character adapted to the new forms of warfare. The inception of the tank in particular owed much to his personal initiative.

Finally, he held very definite views on the difficult problem of the relations between the War Office and the Admiralty, and how to avoid competition between them.[1] Mr. Churchill, as will be explained later, during his tenure of office at the Ministry of Munitions developed these views into the concrete proposal that all material for the fighting forces on sea, on land, or in the air should be supplied by one department and all labour by another.[2] The duty of these two departments would be to make the best use of the nation's narrowing resources in man power and material, and "to give satisfaction to their customers, the fighting departments."[3]

II. Reorganisation of the Ministry.

(*a*) The Munitions Council.

The first problem that confronted Mr. Churchill when he became Minister of Munitions was the reform of headquarters organisation.

Mr. Lloyd George's system of relying upon "big business men" had the defects of its qualities. The independent and competitive action by which they had achieved business success was invaluable from the supply point of view, but there was a natural tendency for men of this type to aggrandise their own departments as in private trade, at the expense of all competitors—which in the Ministry meant inter-departmental rivalry. As they gained power and confidence the heads of the supply branches had been created Directors-General, and escaping from their original subordination to the Director-General

[1] In this connection a special significance attaches to Lord Randolph Churchill's memorandum on Army and Navy Administration (1890), which proposed that supplies for the Army and Navy should be in the hands of one Minister, who would control and manage the Ordnance Department and make contracts for both services. "He would, as it were, set up and carry on a great shop from which the military and naval heads would procure most of the supplies which they needed."

[2] Memo. of 26 August, 1917; 2 February, 12 February, 1918.

[3] See below, pp. 83, 84.

of Munitions Supplies, they competed with one another for labour and materials. The whole hierarchy of departmental heads had the right of direct access to the Minister, who was "burdened with much tedious and unimportant detail," as well as with acrimonious conflicts about priorities. The Minister was in the habit of referring important questions to the Advisory Committee, but the latter was open to the criticism that the Committee did not directly represent the heads of the departments who would be responsible for carrying out the policy recommended by it to the Minister.

In order to deal with this position Mr. Churchill grouped the 70 departments of the Ministry into ten large units, each in charge of a head who was directly responsible to the Minister, and who was a member of a standing Munitions Council organised on the lines of the Board of Admiralty or Army Council.[1] Sir Graham Greene, Secretary of the Admiralty, assisted by Mr. Masterton Smith, who were familiar with the working of the Board system at the Admiralty, were appointed Secretary and Assistant Secretary of the Ministry, and helped Mr. Churchill to carry through his reorganisation.

Council members were given dual functions. Their first function was to act for the Minister by exercising a general supervision of the group of departments over which they presided, and their second function was to take a general interest in the whole business of the Ministry, developing a "Council sense" and not regarding themselves as confined to a particular group. This was secured by the formation of Council committees and of the Co-ordinating Committee.

At the same time the Civil Service element in the Ministry was strengthened by the establishment of a Council Secretariat charged with the duty of harmonising action, circulating information, and watching the progress of business. A group secretary, who was in nearly every case a civil servant, was appointed to each member of the Council, and kept in close touch with the heads of the departments in his group. These group secretaries met daily under the chairmanship of the Assistant-Secretary.

This machinery worked well, and Mr. Churchill stated that he almost invariably adopted reports from members of the Council on difficult questions.[2] He thought it possible that in some respects the progress of business was a little slower, but he was quite certain that the decisions which were taken had been well hammered out and he had great confidence in this machinery. One great advantage was that the frequent meetings of committees of the Council, and the circulation of a daily report of Ministry business to all members of the Council and to all heads of Ministry departments, spread a knowledge of the general policy of the Ministry widely among the more important officers, and

---

[1] For a full account of Mr. Churchill's reorganisation, see below, Chapter VI.

[2] 11 December, 1917. HIST. REC./R/263/5.

enabled them to see their own work in relation to the whole programme of the Ministry. The Minister also held occasional meetings with all heads of departments to inform them of the general policy of the Ministry at critical stages in the war.[1]

Reviewing this organisation on 13 January, 1919, Mr. Churchill stated that the whole system had worked with extraordinary smoothness, and he had not the slightest doubt that the existing organisation was " very near the conventional form and model which organisations of this great size will have to assume in the future." In a task like that of the Ministry the combination of business men and of Civil Service officials was vital.

> " You have at once the initiative and the drive and force and practical experience of the open competitive world, coupled with those high standards of duty and that long experience of official routine and of methods which are the qualifications of the Civil Service."

The establishment of the Munitions Council was followed by further important changes in departmental organisation. By arrangement with the Secretary of State for War, Lord Derby, a new Chemical Warfare Department was formed under Major-General H. F. Thuillier to develop the use of gas for offensive purposes, work which was already established in the Ministry, and at the same time take over from the War Office the branch which had been responsible for anti-gas services which dealt with protective appliances. The new department brought into close association the labours of eminent scientists and service experts. A similar reorganisation of the trench warfare services of the Ministry was directed towards the reinforcement of the staff responsible for the functions of research, design and supply in regard to new forms of military apparatus for trench warfare, including not only trench mortars, grenades and bombs, but also trench furniture, fireworks, armour in various forms and ropeways. The activities of the new organisation, as outlined by Mr. Churchill, were to be based upon " a sustained and instructed study of the daily and hourly life of the soldier in the trenches by those who really know what his life is and what his, often unformulated, needs are."[2]

The new departments were predominantly military in character and were appropriately included with the military services of the " Design Group." At a later date (June, 1918) this group was subdivided and a new " Warfare Group " was established under Major-General J. E. B. Seely, D.S.O., which brought together the departments dealing with Chemical and Trench Warfare, Tanks and Inventions. Thus a fresh impetus was given to these rapidly developing services and an important step was taken in the direction of improving the contact between the work of the Ministry and the experience of the forces in the field. The characteristic features of this movement

[1] 11 December, 1917; 15 March, 1918; 8 April, 1918; 3 September, 1918; 22 October, 1918; 11 November, 1918.

[2] Estab. Cent, 53/47.

were the increased reliance upon associated experts whether military or scientific and the energetic search for the most efficient application of mechanical equipment to the new warfare.

(*b*) Financial Administration.

During Mr. Churchill's period the financial arrangements of the Ministry were subjected to a close examination by the Select Committee on Public Expenditure.[1] In an attempt to check the flow of money from the Exchequer and to find some substitute for the control formerly exercised by the Treasury, the Select Committee proposed that munitions programmes should be criticised at the outset by the highest financial authority of the Ministry. But the creator of programmes was not the Ministry but the War Office, and though the Minister of Munitions, through his knowledge of labour conditions and of the supply of materials and tonnage, could help the War Office to readjust its programmes, his responsibility for considering the effect of these programmes upon the national finances was limited.[2]

The War Cabinet, in fact, was the only body which was in a position to know whether the nation could afford to carry out the maximum munitions programmes and to balance the possibilities of bankruptcy or defeat, and the Cabinet in effect decided that the military situation made the maximum munitions programmes a necessity, and that the nation could finance the largest programmes for which tonnage, materials and labour could be found. Finance, therefore, was not the limiting factor of munitions programmes in this period,[3] except temporarily, in the case of adverse foreign exchanges.

It was obvious, moreover, that careful financial administration would enable the Ministry to carry out larger programmes without increasing the burden of national indebtedness, and it was arranged that the criticism of the Contracts and Finance Departments should be brought to bear, at the earliest possible stage, on the programmes drawn up by the supply departments of the Ministry.

The Select Committee thought that the position and authority of the Finance and Contracts Departments, whose duty it was to curb the natural tendency of the Supply Departments towards extravagance, had been diminished by the abolition of the office of Assistant Financial Secretary and by the predominance of supply officers on the Munitions Council. Mr. Churchill met these criticisms by the appointment of one of the Parliamentary Secretaries as Financial Secretary, who was responsible to Parliament and who acted as Chancellor of the Munitions Exchequer,[4] and by the decision that the Contracts Department should have the final responsibility for the terms and prices of contracts.[5] In the case of a difference of opinion between Contracts, Finance, and

---

[1] For a full account of financial administration during the period, see Vol. III, Part I, Chapters IV and V.

[2] See Vol. III, Part I, Chapter IV.

[3] *Parliamentary Debates* (1918), *H. of C.*, CV, 1192.

[4] 4 February, 1918.

[5] 22 February, 1918.

Supply, the ultimate appeal was to lie to the Co-ordinating Committee of the Council with the Financial Secretary in the chair, while in the final scheme of organisation ample provision was made for the representation of Finance and Contracts on the sub-committees charged with the detailed consideration of programmes.

In Mr. Churchill's words, the appointment of Sir Laming Worthington Evans as Financial Secretary was made with the view of bringing "financial practice up to the high level which is expected, and on which the country will certainly insist; and reclaiming for the public, as against private interests, every farthing that can usefully be saved or extracted."[1]

The vindication of the claim of the Contracts Department to be the supreme authority for fixing prices ended a struggle between Contract and Supply officers which had been going on throughout the history of the Ministry. As the Select Committee pointed out, supply officers were tempted to induce manufacturers to work for them rather than for some other department by offering high prices, and Contracts' officers, less preoccupied with production, were likely to be more efficient trustees of the public purse. Though in the beginning it had been necessary to give Supply officers a free hand to produce munitions at almost any cost, such latitude was no longer generally necessary in Mr. Churchill's period, and the decision that the final authority for the prices and terms of contracts rested with the Contracts Department restored a traditional doctrine of the Public Service that had been abrogated in a time of overwhelming pressure. The reforms in accountancy inaugurated by Dr. Addison were continued under Mr. Churchill. The double entry system, introduced in March, 1917, to replace the old single entry system which had proved quite unsuitable to a great manufacturing department, was in use throughout the Ministry by March, 1918, and in June the task of reconstructing on the same principle the whole of the books of the Ministry was undertaken. An annual balance sheet was prepared; large sums of money advanced by the Ministry to contractors in the shape of raw materials or by way of loan were recovered, while a considerable decentralisation of Stores and Accounting diminished clerical work and saved time and labour.[2]

The flexibility of the administrative machine created by Mr. Churchill was proved in November, when the Armistice was signed. Without any dislocation the gears were reversed, and the Munitions Council, that had been charged with the primary duty of supply, was reconstituted, with only slight changes of personnel, to deal with the liquidation of contracts and the demobilisation of munition works.

---

[1] Meeting with Heads of Departments, 15 March, 1918. See also *Parliamentary Debates* (1918), *H. of C.*, CV., 1159–60.

[2] See Vol. III, Part I, Chapter V, Sections VI and VIII.

III. Admiralty Competition and Proposals for a Ministry of Supply.

Throughout the history of the Ministry of Munitions, Admiralty claims on man power and material were a very serious factor, and during Mr. Churchill's term of office, when the demands of the land forces reached their climax and had to be met from waning resources in man power and material, special efforts were made to harmonise the claims of the two departments.

The existing machinery was not working very smoothly.[1] It had been tacitly conceded by the other departments of State that the Ministry of Munitions, which had the largest interest in the manufacturing output of the country, should take the lead in the matter of priority orders, and the Inter-departmental Committee which had been set up had acted throughout under the hegemony of the Ministry.[2] The latter had, however, no statutory authority behind it, and if any other Government Department contested the rulings of the priority department the situation became difficult.

The conflict of interests between the Ministry and the Admiralty may be illustrated by Mr. Churchill's protests against the Admiralty programme for airship construction, which would absorb steel and skilled labour urgently required for aeroplane work, merchant ship building and railway construction,[3] and against the later programme for Zeppelin sheds, which would absorb labour and steel, and which could not be completed until late in 1919.[4]

Considerable progress towards eliminating these difficulties was made during Mr. Churchill's period. The acute competition for materials was remedied to a large extent by the appointment, on 27 September, 1917, of a War Priorities Committee of the Cabinet, under which departments were rationed with steel, non-ferrous metals, timber, and so on, through Allocation Committees, but the competition for machining capacity, and the conflicts over the priority to be given to Admiralty and Ministry orders by contractors who worked for both, remained.

Various solutions of the problem were debated from September, 1917, onwards.[5] All the arguments pointed to the conclusion that there must be " a single priority authority dealing with all classes of work for all departments in accordance with a definite principle, and in pursuance of the decisions of the Cabinet as to the relative importance and urgency of disputed classes of work,"[6] and on 18 October, 1918, a Joint Priority Board was appointed to act as a common service department for all Government Departments.

---

[1] Letter from Admiralty to Ministry, 11 Sept., 1917. C.R.V./Gen./0367.
[2] Letter to Admiralty, 3 October, 1917. C.R.V./Gen./0367.
[3] Memo. by Sir W. Weir and Sir John Hunter, 14 September, 1917; by Mr. Churchill, 25 September, 1917.
[4] Memo. by Sir John Hunter, 30 January, 1918.
[5] See Memo. on Priority Administration. HIST. REC./H./620/5, pp. 30–33.
[6] Letter to the Admiralty, 3 October, 1917. C.R.V./Gen./0367.

Less progress was made in diminishing the competition for labour and the conflict of labour policy.[1] Five-sixths of the labour employed in munitions industries was engaged on work for the Ministry of Munitions, but the Admiralty had absolute labour priority, and owing to the huge programme for merchant ship building—which aimed at producing more than one and a half times the maximum tonnage of merchant vessels previously launched in any one year[2] —it constantly demanded more men.

The Ministry argued that some of the labour required for this urgent work could be diverted from Admiralty work of less importance, such as shells and other munitions, but since the increased output of shipping would be valueless unless there was a corresponding and simultaneous output of devices for protecting ships from submarine attack, the Admiralty was unable to regard their programme for shells and torpedoes and for mines and stationary devices as less important than that for the construction of ships.[3] Again, since Admiralty work as a whole was heavier, more complicated, and less in the nature of repetition work than that of the Ministry, there was far less scope for the release of skilled labour by the substitution of semi-skilled, unskilled, and female labour. The Admiralty therefore put little pressure upon its contractors to dilute. This handicapped the Ministry by making it more difficult to insist on dilution, while some of the labour it displaced by dilution found a safe haven with Admiralty firms.[4] Another difficulty was the reluctance of the Admiralty to release men for the Army. Between March and November, 1917, the Ministry released 53,000 general service men as against 700 released by the Admiralty.[5]

A Labour Dilution Committee of the War Priorities Committee of the Cabinet was formed to deal with this particular aspect of the question, but the much broader question of the relative urgency of Admiralty and Ministry demands upon the man power of the country remained. Mr. Churchill contended that the effect of the superiority enjoyed by the Admiralty and confirmed by a Cabinet decision was to weaken the nation's war effort. The danger of invasion was now remote, and over-insurance in naval provision might mean losing the war through undue weakness on land.[6] He thought that Admiralty demands for men as well as material ought to be scrutinised in relation to their comparative usefulness in the war. He compared the actual achievements of the R.N.A.S., which absorbed 3,000 officers and 25,000 men, with those of the R.F.C., and the 27,000 men employed in the Airship Service with the 27,800 employed in the Tank Corps. Seventy-five per cent. of this high-class material and brilliant personnel would never come in contact with the enemy —yet the Admiralty proposed an overriding priority for naval

[1] Memo., 22 November, 1917; 2 February, 17 April, 17 May, 1918.
[2] Admiralty letter, 9 October, 1917. C.R.V./Gen./0367.
[3] Admiralty letter, 9 October.
[4] Memo. by Sir Stephenson Kent, 17 April, 1918.
[5] Memo., 1 November, 1917.
[6] Memo., 8 May, 1918.

aviation.[1] Mr. Churchill's contention, in short, was that demands for men and material, whether for the War Office, the Ministry, or the Admiralty, should be scrutinised in relation to their immediate value against the enemy in the crisis of the war and that there should be "a single policy for war labour and a single policy for war supplies."

All this strengthened the argument for a Ministry of Supply. There could be no single policy as long as there were *two* Ministries of Munitions,

> "serving separate interests, competing and clashing with one another in an ever narrowing field of labour and materials. Their officers are intermingled all over the country in nearly every district; their work is proceeding side by side in hundreds of cases. They draw on the same resources; they keep their own reserves at every stage of manufacture, and jostle each other with conflicting priorities."

Mr. Churchill proposed that the Labour departments of both the Ministry of Munitions and the Admiralty should be transferred to the Ministry of National Service, and that the Controller's department of the Admiralty should be transferred to the Ministry of Munitions, which would become a supply department responsible for feeding the three fighting departments.

A single Ministry of Supply would eliminate wasteful competition and translate the varying programmes of the War Cabinet, which were governed by the strategic situation, into production with the minimum of dislocation. It would simplify administration by making one department responsible for deciding priorities and allocating materials, do away with the separate contract accountancy, finance, costings and statistical sections at the War Office, Admiralty, and Ministry of Munitions, economise in skilled engineers, chemists, accountants and inspectors,[2] minimise the evils of separate and overlapping returns, and give an opportunity of inducing manufacturers to specialise on the type of munitions they were the most competent to produce.[3] Such a central supply department would be well fitted to dispose of surplus stocks and stores at the end of the war, to control the distribution of raw materials during the period of transition and to help into a position of independence the key industries established during the war.

This last argument was put forward again on 1 November, when the military successes of the Allies suggested that the end of the war was in sight. A Supply department which had the duty of supplying the three fighting services together with other Departments of State with all the commodities they required, and which, therefore, had

---

[1] Memo., 25 September, 1918.

[2] It was not uncommon to find a comparatively small factory with four or five or even six resident engineers supervising contracts placed by various Government Departments.

[3] Memo., 15 March (Sir L. Worthington Evans).

continually to consider the possible requirements of future supply, would be likely to dispose of stores economically, not hastily or short sightedly or with a view simply to the most rapid liquidation.

The general principle for which Mr. Churchill contended was admitted by the decisions that the Ministry of Munitions should control the sale of surplus stocks and should form the nucleus of a general Ministry of Supply, and that the Labour Branch of the Ministry should be transferred to the Ministry of Labour, making an amalgamation with the Admiralty Labour Department possible.[1] When the time came for the liquidation of the immense war organisation established by the Ministry of Munitions, the possibilities of achieving this object were carefully investigated. But no solution was found which was compatible with national needs under the changed conditions of peace time.

IV. The Inter-Allied Munitions Council.

The competition between the Allies presented a similar problem on a larger scale. As has been seen, the plans for co-operation with the Allies in the supply and distribution of munitions, which had been put forward by Mr. Lloyd George at the end of 1915,[2] had been defeated by national jealousies, and it was not until 1918, when the Allies were nearing the margin of the world's resources in shipping and steel, that they abandoned a national for an international policy.

Some progress had been made towards closer unity, and various inter-allied organisations existed to deal with special aspects of the munitions question, but there was no machinery for reviewing warlike supplies as a whole or deciding how the limited tonnage at the disposal of the Alliance could be used to the best advantage. The difficulties which arose from this lack of central control of resources may be illustrated from the fact that in November, 1917, the English munitions programme for 1918 had to be suddenly curtailed owing to the decision that 2,000,000 tons of foodstuffs for France and Italy were to be imported in British ships at the sacrifice of equivalent munitions tonnage.

Mr. Churchill deprecated general understandings of this kind, and thought specific allocations to meet particular emergencies preferable. A system of share and share alike might be equitable, but it was not the way to win the war.

> "We should be careful not to dissipate our strength or melt it down to the average level of exhausted nations. It will be better used with design by us than weakly dispersed."[3]

The situation was improved for the time by the decision of the French to make drastic food economies, and to transport steel and nitrates with 920,000 tons of the shipping allocated to them for food transport.[4] After the *débâcle* of December, 1917, it was realised

[1] Meeting with Heads of Departments, 11 November, 1918; with Trade Unions and Employers' Advisory Committee, 21 December, 1918.
[2] See Chapter I.
[3] Memo., 11 November, 1917.
[4] Memo., 23 November, 18 December, 1917.

that to keep Italy in the war her urgent needs must be supplied, and throughout 1918 Italian demands for artillery, shell steel and steel for shipbuilding were a very serious factor.[1] The German advance in April deprived the French of a coal-producing area, and both French and Italian demands for steel and coal increased. Their ammunition programmes, and the Italian programme for aircraft engines, had been cut down to danger point,[2] and, in spite of the resistance of the Treasury, Mr. Churchill succeeded in getting the allocation of steel and pig-iron from Great Britain largely increased. At the same time it was decided that, in spite of the coal shortage in Great Britain, France and Italy were to receive 41,000,000 tons in 1918 instead of 30,000,000 tons.

In the meantime the United States was making very slow progress with munitions production, and it appeared that if her troops were not armed and equipped by British effort they would be too late for the crisis of the war.

At the Inter-Allied Munitions Conference of December, 1917, the representatives of the United States urged their Government to obtain their artillery and part of their gun ammunition from French and British factories in order to save time and make full use of existing capacity for artillery production, and to concentrate upon the production of propellants and high explosives and heavy howitzer shell.[3] In order to assist them Mr. Churchill decided (24 December) to despatch an Artillery Mission under General Headlam, which sailed for the States in February, 1918. A general scheme, under which Great Britain would supply the United States with certain heavy howitzers, with Stokes trench mortars, aerial bombs, material for tanks, and so on, was worked out,[4] and an agreement for building a joint tank factory in France was signed on 22 January, 1918.

The British Artillery Mission had to combat many difficulties. America started with many advantages—unrivalled supplies of raw materials, and the tradition of large scale production—but her performances were disappointing. Her manufacturers had been trained by the production of guns, shells, and rifles for Great Britain, while she had the accumulated experience of the French and British armies at her disposal. The standard of armament with guns and gun ammunition, the scale of expenditure, arrangements for synchronising the production of components in order to produce complete rounds, the proportion of spare parts and the average life of guns, the best methods of detonating a new explosive, and the technique of trench warfare and chemical warfare, had all been worked out through painful experience after many mistakes and failures. Yet the American authorities failed to profit by this experience or to adopt French and British designs as they stood, and in the attempt to evolve something better wasted time and delayed production. Again, they organised manufacture on a military basis which led to much friction between the munitions officers and manufacturers.

---

[1] Memo., 3 September, 3 December, 1917 ; 27 February, 1918 ; 7 March, 1918.
[2] Memo., 18 June, 1918.
[3] Memo., 11 December, 1917. *America's Munitions, 1917–18*, p. 15.
[4] Memo. by Mr. Layton and Mr. Hanson, 10 January, 1918.

The menace of the German advance in the spring of 1918 and the crisis in the fortunes of the Allies stimulated the very slow growth of Allied unity. Mr. Churchill realised that the necessity for a joint munitions policy was almost as pressing as the need for a single command, though he was well aware that the theory of "pooling resources" involved in many cases dividing up British resources.[1]

The proposal for the creation of an Inter-Allied Munitions Council came from the British Ministry of Munitions, and the constitution of the Council adopted on 4 June, 1918, was on the lines suggested by Mr. Churchill. The Council, which was composed of the Allied Ministers of Munitions and a representative of the United States, was empowered to review the changes in equipment due to military experience and promote the adoption of the types of weapons found most serviceable, to circulate information on invention, research and design, to encourage the various Allies to specialise on particular classes of output, and to make proposals for the allocation of steel and other raw materials between the Allies after considering the relative urgency of their programmes. The Council worked through various sub-committees on design, aircraft, chemicals, explosives, steel and non-ferrous metals, while there was close liaison with the Inter-Allied transport organisations. The fact that the Council was under French chairmanship was, in Mr. Churchill's opinion, a great advantage. Once the lead was accorded to the French they set themselves to study British wishes, and were much less critical than they would have been if Great Britain had claimed the responsibilities of leadership.

The Inter-Allied Munitions Council won an immediate success on the question of the equipment of the United States armies with French and British munitions. Owing to the decision that American energy must be concentrated on large scale production in 1919 and 1920 rather than on the production of munitions in small quantities in 1919, the first million men America sent to France had been almost entirely equipped with artillery, rifles, trench mortars and machine guns by Great Britain and France.[2] Without this equipment the American troops which were hurried across the Atlantic in the crisis of the war could not have been used,[3] and it appeared that even in 1919 America would find it difficult to munition her armies. America proposed to put 80 divisions into the field in 1919, provided she was satisfied that they could be provided with sufficient artillery. Her progress with tanks, Liberty engines, and aircraft had been disappointing, and both her shell and gun programmes were in arrears, so that unless French and British arsenals could supply the deficiencies the size of the American armies would be limited by lack of munitions. The French were prepared to equip 30 divisions, but could not provide for more. Mr. Churchill, therefore, in consultation with the Army Council, made an offer which would ensure the complete equipment

[1] Meeting with Heads of Departments, 3 September, 1918.
[2] *America's Munitions, 1917–18*, p. 13.
[3] Memo., 12 July, 1918

of the whole 80 divisions, provided the American authorities were prepared to accept British types of artillery.[1]

He offered 1,500 field guns, 710 6-in. howitzers, 180 6-in. guns, 220 60-pdrs., and 450 heavy howitzers. Ammunition for this artillery could be made in the American and Canadian factories whose British orders would terminate early in 1919, and filled in Great Britain. America agreed to take more than 2,000 British guns with their complement of ammunition, thereby extinguishing more than £100,000,000 of British indebtedness to America. Mr. Churchill stated that this would impose no undue strain on British munitions factories—"The gun plants and shell plants are running so smoothly now that, given raw materials, they can easily meet their share of American needs."[2]

V. Munitions Policy.

When reviewing munitions programmes Mr. Churchill always emphasised the cardinal fact of the situation—that British man-power was waning and that the only hope of obtaining a decisive victory lay in multiplying munitions and mechanical engines of war.

He showed that the Allies could not hope for any overwhelming superiority over the enemy in guns and gun ammunition in 1918.[3] The French hoped to have 9,000 guns and the British 8,000 guns on the Western front in 1918.[4] The Germans were credited with 18,416 guns in 1917, of which 12,482 were on the Western front, while they had a much larger proportion of heavy guns than the Allies—twice as many medium howitzers and 60 per cent. more heavy howitzers than the French and British together. Moreover, they were strong in long range guns, in which the British were strikingly deficient.

The gun ammunition programme adopted in July, 1918, provided for an expenditure of 66,000 tons of ammunition per week as compared with 26,000 tons fired in the Somme battles and 47,000 tons in the 1917 offensive, but owing to the tonnage problem, which meant a decline in imports of iron ore, this was the maximum production and might entail some diminution of expenditure in 1919. Thus there was little hope of obtaining any marked superiority over the enemy in guns and shells, and, in Mr. Churchill's opinion, even a huge preponderance in artillery would not solve the problem of maintaining the "continuous offensive" upon which victory depended.

"If you concentrate the bulk of the artillery of a great nation on a narrow battle front and feed it with the whole industry of the people, it is possible to pound and pulverise certain areas of ground so that a limited advance can certainly be made. But the artillery is so local in its action, so costly in its use, and so ponderous in its movement, that the rate of the advance has not hitherto led to any decisive strategic results. . . . It is becoming apparent that the 'blasting power' of the artillery is only one of the factors required. Moving power must be developed equally with blasting power."

---

[1] Memo., 2 September, 1918.
[2] Memo., 25 September.
[3] Memo., 1 November, 1917.
[4] Excluding anti-aircraft guns, the number of British guns in the field in 1917 averaged 5,555 and in 1918, 6,265. HIST. REC./R./1300/93.

The French made great use of long-range guns on railway mountings, and Mr. Churchill proposed that the British should develop a considerable force of mobile and semi-mobile artillery, long-range guns being obtained from old battleships. In any case the artillery and shells available would give but a small margin over the enemy, and Mr. Churchill contended that the overwhelming superiority necessary, if victory was to be obtained before the nation was exhausted, must be looked for in the newer weapons of war—aircraft, tanks, and chemical warfare—aided by a lavish supply of machine guns. Munitions and man power must be economised by framing programmes many months in advance, by working up to a climax, by sparing the Army and saving munitions for a critical battle, not wasting strength in "bloody and indecisive siege operations."

In October, 1917, he stated that an immediate decision by the Government as to whether the British armies in 1918 were to stand on the defensive or take the offensive was of vital importance for the working out of the munitions programme, in order to make the best use of the limited resources at the disposal of the Ministry of Munitions.[1] Later (8 December, 1917) he argued that the British army in 1918 was destined to be a holding force "to bridge the long intervening months before the Americans could become a decisive factor." The greatest possible strength must be mobilised and kept in hand to guard against unforseeable contingencies.[2]

> "It is vital to us to have in the field at the opening of the spring campaign a British army stronger and better equipped than we have ever had before, because the burden thrown upon it is going to be greater than before. On the other hand this army, once raised and restored to its full efficiency and strength, must be husbanded and not consumed. It must be an army crouched and not sprawled; an army with a large proportion of divisions in reserve at full strength, resting and training; an army sustained by every form of mechanical equipment, including especially tanks and aeroplanes, and possessing the greatest possible lateral mobility."

Owing to the recent heavy casualties, in order to bring the Army up to strength and provide a strategic reserve—or, in Mr. Lloyd George's phrase, "an Army of Manœuvre"—and meet the demands of the Navy, 650,000 men must be found. Mr. Churchill advocated limiting the Navy's demand for men, especially for building capital ships, a clean cut from munitions and shipbuilding of men below 24 years of age, a reduction of the home army of defence and of the Irish garrison.

Later (5 March, 1918) Mr. Churchill asked a fundamental question —"If you cannot starve out your enemy, if you cannot bear him down by numbers, or blast him from your path with artillery, how are you going to win?" The policy of blockade could no longer be relied upon to produce decisive results now that Russia was open to the Germans, and even with the American armies the Allies would have little superiority in man power. Shell production had reached

[1] Memo. of 21 October, 1917. [2] Memo. of 8 December, 1917.

its limit, and the tonnage of 1919 would not do more than maintain 1918 standards. Again, the limits of gun power were coming very clearly into view. After a certain point it tended to defeat its own purpose, for the ground was so ploughed up by artillery preparation that it was impossible for troops to advance over it. Victory, therefore, could only be won by developments of a far-reaching character in the new methods of warfare—aeroplanes, tanks, gas, and machine guns—all of which possessed decisive qualities, in spite of the fact that they had been only "tardily and partially and doubtingly developed." The air expansion was practically conceded, the development of machine guns and automatic rifles was assured, but the most vital of the new arms—tanks and gas—were only used on a miniature and experimental scale. Since resources were limited, the necessity of developing the new arms both in men and material at the expense of the old should be boldly faced.

"We should create, in order to attack the enemy in 1919, an army essentially different in its composition and methods of warfare from any that have yet been employed on either side."[1]

The power of the defensive was such that practically the whole spare artillery of an army had to be collected in order to support a single attack in which there was no room for more than one-tenth of the available troops. The *tempo* of the war had progressively languished since the Battle of the Marne. Every year a smaller percentage of the combatant strength of the armies had been engaged. To escape from this deadlock and to make simultaneous attacks all along the British front, three or four times the existing artillery would be required. This being unobtainable, the modern substitutes—gas, tanks, trench mortars, and air warfare—must be used to enable local attacks to be delivered simultaneously with the main attacks. "That would be war proceeding by design through crisis to decision, not mere waste and slaughter sagging slowly downwards into general collapse."[2]

When Mr. Churchill took office substantial reserves of filled and unfilled shell had been accumulated, and all his programmes were designed to provide a substantial reserve of unexpended ammunition at the end of each campaign which might be carried forward to the following year. The wisdom of this policy was justified in the crisis of 1918, when the heavy losses of material due to the German advance were made good from reserves with the minimum of delay.[3] By 6 April, nearly two thousand additional gun equipments were available, together with 230,000,000 rounds of small arms ammunition, while twice as many machine guns as had been lost were placed at the disposal of the army. Every tank that had been lost was being replaced by a tank of a newer and better pattern.[4]

On the other hand, there was a danger that the policy of reserves might be carried too far. The Supply departments tended to lock up

[1] 5 March, 1918.
[2] Memo., 5 March, 1918.
[3] Memo., 26 March, 1918. Meeting with Heads of Departments, 8 April, 1918.
[4] *Parliamentary Debates* (1918), *H. of C.*, CV, 1141.

raw material by accumulating special reserves at various stages of manufacture; and Mr. Churchill had considerable difficulty in persuading them that this was a mistake, and that, owing to the shortage of materials and labour, over-production by any supply department was almost as dangerous as under-production. Programmes were an accurate measure of the direction of munitions effort; the munitions machine was running at the highest possible limit of labour and material, and a department which was prodigal of output might starve another department of essential material and labour. Again, fashions in munitions changed rapidly, and too large a margin of safety meant an accumulation of out-of-date stores—such as the two years' reserves of the 101 fuse. Every department of the Ministry must review the precautionary reserves that had been accumulated at every stage of manufacture in order to release material.[1] If the programmes were to be met there was no room for unexpected or unauthorised surpluses at any stage of manufacture. Munitions production to be successful must be exact and precise, and though the existence of these secret reserves had enabled the cut in tonnage to be met without an equivalent reduction in the munitions programme for 1918, Mr. Churchill warned the departments (15 March, 1918) that it would be dangerous for them to over-estimate their needs or to accumulate any reserves beyond those which were reasonable and prudent.

VI. Man Power and Labour Policy.

The waning of British man power, which made Mr. Churchill so insistent on the necessity of fortifying the army with every possible mechanical engine of war and on the necessity of harmonising Admiralty and Ministry of Munitions demands for labour, made the labour policy of the Ministry at once more difficult and more vital.

Throughout 1917 men were being taken from munitions for the Army by a process of dilution and substitution which released 53,000 general service men between March and November, 1917, without diminishing output. The German advance in the spring made the need of men desperate and involved the adoption of a "clean cut," which took men of 19 and 20 from munitions industries and resulted in a serious loss of output, especially of pig-iron and steel, tanks, range-finders, and aeroplanes. Between January and July, 1918, 100,000 men were released, and it was clear that if the demands of the army for extra tanks, poison gas, long-range guns and small arms ammunition were to be met, as well as the immense aeroplane programme and the necessities of the American army, the policy of release had reached its limit. When the tide turned in France, therefore, the Minister applied for the release of some of the pivotal men already drafted into the Army, and asked that the clean cut with regard to men of 21, 22 and 23 should not be proceeded with, and that in the future releases should take place as and when efficient substitutes were secured and trained.

[1] Meetings with Heads of Departments, 11 December, 1917; 15 March, 3 September, 1918.

Mr. Churchill summarised the situation as follows :—

> " On the one hand there are available in America enormous numbers of men in the prime of life ; on the other hand, in Great Britain, for the sake of getting comparatively small numbers of men of inferior physique who will not be much use, or of superior skill who cannot be spared, we run the risk of endangering production of munitions on which not only our own Armies, but the rapid importation of American troops depend. The situation has, in fact, undergone a very great change, and we shall commit another of the great mistakes of the war if we do not adapt our policy to it in time."[1]

A number of men were released for work on tanks, and in September Mr. Churchill asked for and obtained the release of men for blast furnaces, scientific instrument making, forgings and stampings.[2] Later (23 October), he asked that 9,000 men should be returned to munitions, especially for work on tanks, guns, and aircraft. He thought that dilution in the munitions industries had reached its limit, and that the Army Council must decide whether an increased output of 2,082 tanks by September, 1919, was not worth more than 3,000 skilled men in the Army.[3]

This combing out of the munitions industry was not accomplished without friction, and the Munitions of War Amendment Act (1917), which abolished leaving certificates, added to the difficulty of the situation. Mr. Churchill was doubtful about the wisdom of this policy, to which, however, the Ministry was committed when he took office. He had been warned that if freedom was restored to labour skilled men would be able to take full advantage of their scarcity value, and that employers would vie with each other in offering them higher wages.[4] The excess profits duty blunted the interest of employers in keeping down wages,[5] and they were able to throw the burden of increased wages on to the tax-payer to a large extent. Their chief anxiety was to get quick output and not be worried with dilution. They bid against each other, therefore, for skilled labour, and skilled men " hurried from place to place to bathe their hands in the golden fountain."[6]

The Ministry met the increasing scarcity of skilled workers by two expedients—by pressing men to enrol as War Munitions Volunteers, thus increasing the reserve of mobile skilled labour,[7] and by rationing skilled labour to firms. The former policy, being reinforced by the hint that the Minister could not " continue to extend protection from military service to those men whose services are not being fully

[1] Memo. of 12 July, 1918. [2] 5 September, 1918. [3] 23 October, 1918.

[4] Report of meetings with Federation of British Industries, &c. (8 August, 1917), Employers' Consultative Committee (9 August).

[5] Time and line contracts had the same effect, and although the proportion of them to the total number of munition contracts was small, one time and line contract in an area would disturb wages rates in a hundred different firms in that area.

[6] Mr. Churchill's speech to Press representatives, 19 July, 1918.

[7] The Cabinet approved this policy on 24 April, 1918.

utilised on their present work, and who refuse to place their services at his disposal for transfer to more urgent work,"[1] gave good results.

The embargo policy, which placed a limit on the number of skilled workers which particular employers or firms were entitled to engage, was less successful at first. Introduced on 8 June, 1918, it led to grave unrest, culminating in serious strikes at Coventry in July. The Minister refused to give way—and his action was supported by the Cabinet.[2] He pointed out that the policy of rationing employers with skilled men was the last alternative to industrial conscription. Skilled men were rapidly becoming teachers rather than producers, and if employers were allowed to take on three or four times as many men as they needed to maintain production the nucleus of skilled men required to start up other workshops could not be obtained. The utmost production of munitions of war was required to make up for waning man power. The skilled workers who were resisting the embargo policy were kept at home only because their work was vital to the production of munitions, and if they refused to work the Minister could no longer stand between them and their liability to go into the Army. Faced with this dilemma of " work or fight;" the men gave in. The strikes collapsed and the embargo policy was justified.

Paradoxically enough, much of the industrial unrest that marked the last three months of 1917 and the early part of 1918 was due to the award of a bonus of 12½ per cent. to time workers in the engineering industry. This award, of which a full account will be given elsewhere, was designed to meet the " skilled man's grievance "—the fact that the foreman, the toolmaker, the skilled time-worker in general, was unable to earn as much as the unskilled or semi-skilled worker on piece-work, who merely operated the machines, and who was dependent upon him for help in all difficulties.[3] This grievance had been referred to in seven out of the eight reports of the Commissioners on Industrial Unrest (July, 1917), and when introducing the Munitions of War Amendment Bill on 15 August, Mr. Churchill promised to improve the rates of certain time-workers with the view of removing a standing grievance and of preventing an extensive migration among skilled workers, to whom the Act would restore freedom of movement and of bargaining.[4] The most serious form such a movement could take was a migration from the higher ranks of labour into the less highly skilled, though more highly paid, forms of labour.

A bonus of 12½ per cent. on earnings to all skilled men on time-work in the engineering trades[5] was awarded with the approval of the Cabinet on 13 October. It led immediately to unrest among the

[1] Press announcement, 10 May, 1918.

[2] Memo. of 16 July, 1918.

[3] Conference with Trade Unions of Great Britain, 1 August, 1917; see also Vol. V, Part I.

[4] *Parliamentary Debates* (1917), *H. of C.*, XCVII 1305. It was thought probable that if they were not given the bonus many skilled time-workers would leave their employment to take up piece-work. Meeting with Employers' Consultative Committee, 9 August, 1917.

[5] Mr. Churchill had put forward a scheme confining the bonus to the " tool room " and " maintenance " classes.

lesser skilled unions, who demanded the extension of the grant to those of their members who were working with the skilled men who had received the advance, and on 15 November Lord Milner and Mr. Barnes (to whom the decision of the question had been remitted by the War Cabinet) conceded a 12½ per cent. advance to semi-skilled and unskilled time-workers in the engineering, foundry, and boilermaking trades and to all time-workers—skilled and unskilled—in the shipbuilding trades. Later the concession was extended to the steel and iron trades, the electrical trades, and the building trades, and on 15 March, 1918, Mr. Churchill estimated the total cost of the bonus at between 30 and 40 millions a year.[1]

Summarising the results of the 12½ per cent. award on 18 February, Mr. Kellaway stated that it had averted the general migration of skilled labour and consequent loss of production that had been anticipated as a result of the abolition of leaving certificates. Production had been increased and industrial strife had been averted.

> "The effect of the 12½ per cent. bonus upon industrial conditions in this country has been thoroughly sound . . . there are fewer strikes in this country to-day than at any period during the war."[2]

This general improvement in the pay of time-workers led to agitation among piece-workers. The general level of earnings was high, but there were certain areas where unduly low piece-rates prevailed and where there was consequent dissatisfaction. Mr. Churchill protested against the proposal to give piece-workers a general advance of 7½ per cent., and urged that the proper way of meeting the unrest, which was sectional, not general, was to revise such piece-rates as were unduly low.[3]

> "It would be absurd to pay an increase to large classes of workers who at piece-rates are earning upwards of £5 per week, and in some cases up to £25 per week, and to make such an advance in the form of a percentage on wages is to leave the grievance of the low-rate piece-worker practically and relatively unredressed, and to pay unasked the percentage on the very high earnings of the highest paid piece-workers. If the advance is extended generally to piece-workers the women will be dragged in, and these again will react on the time-workers' position and lead to the inclusion of women time-workers in the original 12½ per cent."

Further, the concession would deprive the skilled time-worker of the relative advantage he had obtained by the 12½ per cent. advance and would lead to another agitation for an improvement in time-rate earnings.[4] The advance was, however, conceded.

On 19 September, 1918, Mr. Churchill drew attention to the sectional advances of large amounts which were being granted by

[1] Meeting with Heads of Departments, 15 March, 1918.
[2] *Parliamentary Debates* (1918), *H. of C.*, CIII, 545–6.
[3] Memo. of 22 January, 1918.
[4] Memo. by Sir Thomas Munro, Sir Stephenson Kent and Mr. Wolfe (22 January, 1918).

employers in the munitions industries—especially in London—to skilled engineers, wood-workers, and electricians. The abolition of the leaving certificate had restored to the workmen their bargaining power, the shortage of labour among many classes of skilled men had accentuated it, and the constant extension of the munitions programme had intensified the competition among employers, who were no longer directly interested in keeping wages within reasonable bounds. It was desirable to stop employers from making these sectional grants, which led to unrest and the movement of labour without increasing production, but the provisions of the Munitions of War Act were ineffective for the purpose, and where firms had been prosecuted for flagrant disregard of the Ministry's instructions purely nominal fines had been imposed. Increased cost of living ought to be met by general awards by the Committee of Production, not by sectional unauthorised advances.[1]

Reviewing munitions labour as a whole, Mr. Churchill paid a tribute to the "enormous industry and efficiency" of the $2\frac{1}{2}$ or $2\frac{3}{4}$ million employees of the Ministry—less than 1 day in 400 having been lost over the whole area by strikes.

VII. Munitions Programmes.

During Mr. Churchill's tenure of office munitions programmes reached their climax.

The 1918 programme for guns and gun ammunition was half as large again as the 1917 programme, the aeroplane programme was tripled, the programme for chemical shell was two and a half times the 1917 programme. The Admiralty shipbuilding programme was doubled, and there were very large demands for railway material, while, owing to the fact that orders for munitions from Canada and the U.S.A. had to be curtailed upon financial grounds, almost the whole burden of these gigantic programmes had to be met from British resources.

On the other hand, the Ministry was reaping the advantage of the immense new plants begun in 1915, while, in spite of the progressive dilution, the productivity of a given quantity of labour tended to rise. In Mr. Churchill's words :—

> "The power of massed production and the increasing efficiency of diluted and female labour together with the accumulation of working stocks and adequate reserves and the progressive elimination of commercial work render possible a large increase in the total output so long as the necessary tonnage and labour are forthcoming."[2]

The supply departments of the Ministry had undoubtedly built up a reputation for efficiency. The War Office, the Air Board, and the Army generally felt such complete confidence that the Ministry would meet all their demands that they took it for granted—"like the

[1] Memo., 19 September, 1918. Meeting with Management Committee of Engineering Employers' Federation, 4 October.
[2] Memo., 1 November, 1917.

weather or like the air they breathe." This was a valuable asset at a time when huge programmes were being formulated, and when it was apparent that the only chance of victory over the enemy lay in the utmost development of air warfare, of mechanical and chemical warfare, while maintaining artillery at its highest point and developing all forms of transport.[1] The fulfilment of these programmes demanded, of course, adequate tonnage for imported materials, adequate steel and labour. In Mr. Churchill's words :—

> "The foundation of the Munitions budget is tonnage; the ground floor is steel; and the limiting factor in the construction is labour."[2]

At the outset the tonnage problem was the most formidable, but by the summer of 1918 the danger point had shifted; the shortage of labour had become more acute owing to the drain of men for the Army, especially when the military crisis of April and May, 1918, necessitated a "clean-cut" of certain classes, and a serious coal shortage threatened the maintenance of munitions industries.

When Mr. Churchill took office tonnage was already severely restricted, and the importation of iron ore had been cut down to the lowest level consistent with safety.[3] The output of steel, however, had been considerably developed, and, on the basis of the existing allocation of tonnage, it was anticipated that 10,000,000 tons of steel would be available in 1918. This was the situation in November, 1917, but two successive cuts in munitions tonnage (December, 1917, and January, 1918) had a serious effect upon munitions programmes.

In spite of every effort to increase production by the use of home ores, steel was a limiting factor throughout Mr. Churchill's period, and the central problem was a steel problem—firstly, to allocate steel as between the Admiralty and the Ministry of Munitions, leaving a residue for commercial demands and supplies to the Allies; and, secondly, to decide how the steel allocated to the Ministry could best be utilised in the production of guns and gun ammunition, tanks, aircraft, railway materials, and so forth. In order to give an indication of the relative scale, it should be noticed that the 1918 steel budget of 10,000,000 tons was roughly allocated as follows :—

Admiralty (including shipbuilding)		2,000,000
Munitions—		
Shells	2,500,000	
Aircraft, guns, tanks, military railways	2,200,000	5,400,000
Allies	700,000	
War Office, India Office, &c.		600,000
Steel for France from U.S.A.		500,000
Construction, machinery, and civilian services		1,500,000
		10,000,000

[1] Meeting with Heads of Departments on 11 December, 1917.
[2] Memo., 1 November, 1918.
[3] More than half the total munitions imports consisted of iron ore. Memo., 1 November, 1917.

This budget allowed for the expenditure of 66,000 tons of gun ammunition per week during the 32 summer weeks of 1918, and was based upon an importation of 12¾ millions of munitions and munitions materials in 1918.[1]

The decision of the Milner Committee of the Cabinet at the end of 1917 to reduce munitions imports to 11,000,000 tons meant a serious diminution in the imports of iron ore, and involved cutting down the steel budget to 8,500,000 tons and reducing the stocks of nitrate to the absolute minimum required for safety.[2] As a result, the gun ammunition programme was reduced by 20 per cent., which would allow 53,000 tons instead of 66,000 tons of ammunition a week during the campaign season of 1918 (32 weeks). This would mean a decline in the ratio of ammunition to guns at the moment when the artillery programme reached its maximum, and would make the British army inferior to the French army both in numbers of rounds and weight of shells. It was necessary for 300,000 tons of filled ammunition to be held in reserve at the end of the 1918 campaign to prevent a heavy drop in the supplies available in 1919.

Another drastic cut in tonnage was proposed in January, 1918, in order to allow a larger importation of food and cereals and release shipping for the transport of American troops.[3] Mr. Churchill made a strong protest. He pointed out that the only way of saving tonnage —buying finished munitions and explosives instead of importing raw materials—was impossible owing to the dollar situation. The proposed cut would reduce munitions tonnage to 9,000,000 tons and make it impossible to meet the demands of the Army. The Cabinet was asked to decide to what extent the Navy, the Army, and the public services respectively were to bear the reduction.

As a result of this protest, tonnage amounting to 10,000,000 tons was allotted to munitions, but owing to the fact that the Food Controller was unable to import as much food as he had anticipated, munitions were imported up to the date of the Armistice at the rate of about 12,000,000 tons per annum. When considering the 1919 programme, Mr. Churchill proposed to budget on the same basis— an allocation of 10,000,000 tons, but to order shell and steel in the U.S.A. and Canada up to 12,000,000 tons of imports in the hope that the pessimistic estimates of the Shipping Controller might be improved upon.[4] On this tonnage allocation the steel department could not xpect to produce the 12,000,000 ingot tons they had hoped for in 1919.

The programme for 1919 was also threatened by the coal shortage. Owing to the calling up of 75,000 coal-miners, it was estimated that the output during 1919 would be reduced by 19,000,000 tons, while increased demands for the Allies,[5] for the production of steel for strategic railways overseas, for the Admiralty, and for munitions,

[1] During 1917, 12½ million tons had been imported.
[2] Memo., 18 December, 1917.
[3] Memo., 24 January, 1918.
[4] Meeting with Heads of Departments, 3 September, 1918.
[5] The coal shortage in France and Italy was desperate. They had been promised 11,000,000 tons extra, making a total of 41,000,000 tons during 1919.

would need an addition of 16,000,000 tons to the 1917 consumption, giving a net deficiency of 35,000,000 tons on a total of 250,000,000 tons. Part of this deficiency could be met by economies in domestic consumption, but the rest of the saving must come from gas works, the munitions industries, and general manufactures. There was no hope, therefore, that munitions industries would obtain an increased allocation of coal in 1919—they would be fortunate if they succeeded in getting the same amount as in 1918—and steel production must remain at the 1918 level. On this steel basis Mr. Churchill thought the best policy would be to diminish the production of gun ammunition, allowing 40,000 tons a week for the summer of 1919 as compared with 52,000 tons in 1918, and to concentrate all efforts on the production of aeroplanes, tanks, machine-guns, poison gas, and the more complicated engines of war.[1] The 1919 army would be smaller than the 1918 army, but there would be more guns in the field and their longer range would allow of greater concentration and enable the smaller ration of ammunition to be used with greater effect, while the steel, money and man power saved by reducing the output of shells could be devoted to the production of those newer engines of war which both multiplied man power and promised decisive results.

VIII. The Climax of Munitions Production.

(*a*) Guns and Gun Ammunition.

In spite of the development of newer weapons of war, the production of guns and gun ammunition absorbed quite half of the Ministry's productive energy down to the end of hostilities. The chief features of 1917 and 1918 were the development of gun-repairing facilities on a very large scale, the evolution of longer range guns, and the provision of railway or caterpillar mountings for heavy howitzers. The introduction of a new type of 18-pdr. increased the range of the field gun from 6,500 to 10,000 yards, and enabled a much more rapid fire to be obtained. At the date of the Armistice there were 7,578 guns in the field in France, 642 in Egypt, 416 in Salonica, 333 in Mesopotamia, and 265 in Italy.

As far as gun ammunition was concerned, there was ample manufacturing capacity and the only difficulty was shortage of material; 25 per cent. more shell could have been produced in 1918 had it not been for the reduction in the tonnage allocated,[2] and the surplus capacity for gun and shell production enabled Mr. Churchill to offer to supply the American Army during 1919 with more than 2,000 guns and their complement of ammunition.[3]

Fortunately, the design of gun ammunition required little modification during the period. The early detonation difficulties had been overcome, and a letter from the Commander-in-Chief, June, 1917, bore testimony to the efficiency of the ammunition supplied by the Ministry and the low percentage of blinds and prematures. The

[1] Meeting with Heads of Departments, 3 September, 1918.
[2] *Ibid.*, 11 December, 1917.
[3] *Ibid.*, 25 September, 1918.

designing of long-range stream-line shells, of shells with nose-caps, and of the clock-work fuse were, from the supply point of view, of minor importance since these changes did not affect the bulk of the output. Manufacture proceeded so smoothly that, in spite of heavy losses of material during the German offensive, the needs of an army firing shell at an average rate of 1,611,000 rounds or 41,800 tons a week throughout the battle period of 1918 were supplied, a stock of 555,390 tons of filled shell being left when the Armistice was signed.

Though more rounds per week were fired in the 1918 than in the 1917 battles the expenditure in terms of tonnage was less—41,800 as compared with 42,800 tons per week. This was explained by the return to open warfare in the late summer, which increased the expenditure of light as compared with heavy shell; but as the battle front widened and the campaign neared its climax the total volume of firing exceeded anything known before. More than 10,000 tons a day were fired on fifteen successive days, and in the record week ending 29 September, 3,383,700 rounds, weighing 83,140 tons, were fired. On 29 September, when the Hindenburg line was broken, 943,837 rounds were fired, the cost of a single day's ammunition amounting to £3,871,000.[1]

Accurate aircraft observation directing this prodigious fire effected the maximum destruction of enemy artillery. In a single month more than 13 per cent. of the German artillery in the West was completely destroyed by counter-battery fire. If this rate of destruction had been maintained it would have been necessary to replace the whole of the German artillery in the West—apart altogether from the wear of guns—twice in the course of the year.[2]

Mr. Churchill gave instructions that the manufacture of explosives should be pushed to its extreme limit, and in order to meet the difficulty arising from the shortage of nitrate a factory for the fixation of atmospheric nitrogen was sanctioned. Though more high explosive was produced by existing plant than was required to fill the artillery shell available, there would be no difficulty in conveying high explosive to the enemy by other methods—by increasing the output of trench mortar bombs and of aerial bombs—the most popular types of which were made of cast iron. At the date of the Armistice high explosive was being produced at the rate of 4,225 tons per week, cordite at the rate of 1,762 tons per week, and N.C.T. at the rate of 1,177 tons per week, while the following programme had been adopted for 1919 :—

Propellant—	
Cordite	2,000 tons per week.
N.C.T.	1,065 ,, ,, ,,
High Explosive—	
Picric Acid	200 ,, ,, ,,
T.N.T.	1,235 ,, ,, ,,
Ammonium Nitrate	2,700 ,, ,, ,,

[1] HIST. REC./R/1300/93. [2] Memo., 26 September, 1918.

(*b*) Chemical Warfare.

Mr. Churchill advocated a very great extension in the use of gas in order to take advantage of the fact that the direction of the prevailing winds made the British chances of success in a gas attack six to nine times as great as the German.[1] On the other hand, certain difficulties had to be faced. There was a danger of killing French civilians behind the enemy's lines if gas clouds were used on a very large scale; while the use of cylinder gas was very unpopular in the Army owing to the great labour it entailed. Again, the personnel available for gas warfare was very limited—perhaps 6,000 or 7,000 men—which was "only trifling with the problem." Mr. Churchill thought much more use might be made of cylinder gas, and that other alternative methods might be considered, such as the discharge of gas from tanks at the railhead and its use in aerial bombs, but General Headquarters was unconvinced.[2]

There was great delay in the production of mustard gas as a reply to the German use of this gas in July, 1917, and British troops suffered heavy casualties in the spring of 1918, without being able to make any adequate reply. It was not until September, 1918, that mustard gas was available in any quantity.

By the middle of 1918 the artillery was firing nearly one-third of its ammunition as gas shell. Chemical filling was provided for all the chief natures of shell from 18-pdr. up to 6-in., and plans were being made to provide chemical shell for 8-in. and 9·2-in. howitzers, the total chemical shell requirement for 1919 being 174,000 per week. About 450 tons of gas were being produced weekly at the date of the Armistice, and gas warfare was on the eve of great developments. A new gas had been discovered which was 4,000 times as effective as any gas in use. Arrangements had been made to put over the German lines during 1919, 45,000 tons of gas as compared with 9,000 tons in 1918, and the employment of gas from tanks, aeroplanes, and trench mortars was being considered.[3]

(*c*) Tanks.

The development of tank supply in 1918 was largely due to Mr. Churchill's energy.[4] When he took office tanks were regarded as a useful rather than an indispensable adjunct to infantry; they had to a large extent disappointed the high hopes that had been formed on their first appearance in 1916. The offensive at Cambrai, however, rehabilitated these engines in military opinion.

> "In the attack in Flanders we gained 54 square miles with an expenditure of 465,000 tons of ammunition at a cost of £84,000,000, and probably over 300,000 casualties. The offensive at Cambrai, depending as it did entirely upon the surprise use of tanks on a large scale, gained 42 square miles with an expenditure of 36,000 tons of shell costing £6,600,000,

[1] Memo. of 1 November, 1917.
[2] Conference at G.H.Q., 19 March, 1918.
[3] Memo. by Colonel Harington, 24 October, 1918.
[4] See Vol. XII, Part III.

and with a loss of life which, had the operation been confined to its early and fruitful stages, would not have exceeded 10,000 casualties."[1]

Mr. Churchill constantly emphasised the importance of mechanical engines as a means of multiplying man power. Though the value of novelty had been thrown away, it was within the power of the Ministry to construct very large numbers of armoured vehicles of various types.

> "Some to fight, some to pursue, some to cut wire and trample trenches, some to carry forward men or machine gun parties or artillery or supplies, to such an extent and on such a scale that 150,000 to 200,000 fighting men can be carried forward certainly and irresistibly on a broad front and to a depth of 8 or 10 miles in the course of a single day."

The personnel required for manning the additional tanks might be drawn from the Navy and from the 30,000 to 40,000 cavalry who were still in France.[2]

Mr. Churchill created a Tank Board under Major-General Seely to develop tank design and supply keeping in close touch with the Tank Corps in France. The 1918 tank programme provided for 4,459 tanks—light, medium and heavy tanks, supply tanks, gun carriers, and salvage tanks—by April, 1919, and 8,883 by September, 1919.[3]

The work of the tanks in the 1918 campaign justified Mr. Churchill's hopes. By the use of tanks, the British army for the first time obtained a tactical superiority over the machine guns of the defence, and the power to develop surprise attacks, without preliminary artillery bombardment, was given to the troops.

> "It is not a case of gradual conversion, but universal and spontaneous conversion, which has now occurred on the battle front about the tanks. Every General clamours for them . . . and there is not the slightest doubt that they have played a decisive part in our tactics."[4]

On 17 September the Army Council decided to extend the Tank Corps, and asked for 4,000 tanks by 1 January, 1919. The successes achieved in this campaign by 600 or 700 tanks and a tank corps of 35,000 men led Mr. Churchill to anticipate great results in 1919, when some 4,000 should be available of greatly improved design, enabling them to be manœuvred much more easily at a higher speed, fitted with smoke-producing devices, and adapted for night operations.[5]

(*d*) AIRCRAFT.

The output of aircraft was "one of the great achievements of the Ministry of Munitions." As soon as the Ministry took over supply there was great progress towards standardisation, the 51 types existing

[1] Memo., 8 December, 1917.
[2] 8 December, 1917.
[3] Memo., 7 March, 1918. Tank Board Minutes, 21 August, 1918.
[4] 3 September, 1918.
[5] Letter to Mr. Lloyd George, 9 September, 1918

in January, 1917, being reduced to 13 by September. The policy of the Ministry was to get a new type well proved before manufacture in bulk was undertaken, since it took 15 or 16 months to get economical production of a new type of aeroplane and 12 months to get production of a new type of engine. The War Cabinet authorised the number of active service squadrons being raised from 67 to 200, and to meet this demand the Ministry adopted a programme providing for the production of aeroplanes at the rate of 3,500 per month and of engines at the rate of 4,000 per month by September, 1918. This meant an increase of 199 per cent. and 227 per cent. over the output of July, 1917. The Commander-in-Chief and the Army Council decided that aeroplane construction must have priority over all other War Office orders for munitions.

Reviewing the programme on 4 September, 1917, Sir William Weir showed that the limiting factors were alloy steel, carbon steel, ball bearings, silver spruce, and skilled labour. The programme would require 100,000 workers, a very small proportion of whom—say 1 in 15—must be skilled; but that proportion was essential. If the programme was to be carried out, other war work—especially Admiralty work on airship construction—would have to be postponed.[1]

The heavy losses during the fighting of the spring were made good with extraordinary rapidity, and speaking on 8 April, Mr. Churchill said that the Air Force was stronger than when the battle began. By the autumn there were 200 squadrons in commission, and the rate of output of machines at the date of the Armistice was 4,000 a month or 50,000 a year.[2]

Between July, 1918, and the date of the Armistice, 8,000 enemy aeroplanes were either destroyed or driven down, 2,800 British machines being destroyed or lost. Most of the fighting took place over the enemy's lines, and British supremacy in the air had produced striking results in the destruction of German artillery[3] and denied to the enemy the use of aerial observation for counter-battery work. In the service of this reconnaissance work there had been an extraordinary development of aerial photography. The earliest experimental photographs, in November, 1914, were taken from a height of about 3,000 ft., but by November, 1918, the increased range of anti-aircraft guns had forced the photographing aeroplanes up to a height of 22,000 ft., or 4 miles,[4] necessitating the use of special optical glass for photographic lenses. During October, 1918, approximately 24,000 negatives were exposed and 640,000 prints were issued to the Army.

At the date of the Armistice aerial fighting was on the eve of great developments. There had been combats between formations of 80 to 100 machines armed with improved machine guns, the rate of fire of

[1] Report by Sir William Weir to Munitions Council, 4 September, 1917.

[2] Speeches by Lord Weir, 15 March, 1919, and General Seely, 13 March, 1919. *The Times*, 17 March; *Parliamentary Debates* (1919), *H. of C.*, CXIII, 1501. The average weekly deliveries in October, 1918, were 747 aeroplanes, 34 seaplanes, and 630 aero-engines.

[3] See above, p. 98.

[4] Speech by Lord Weir, 15 March, 1919.

which had been increased from 600 to 1,000 rounds a minute, and guns of much greater range, firing shell instead of bullets, had been used in aeroplanes. Improvement in design had been rapid. Comparing the early single-seated fighter with the modern bombing machine, Lord Weir stated that the speed had increased approximately from 94 miles to 141 miles per hour, the climb of 15,000 ft. had been reduced from 32 minutes to 25 minutes, while the horse-power had advanced from 80 to 300.[1] Some of the planes in course of construction had a span of 125 ft., the gross weight being 30,000 lb., with engines of 1,500 h.p. Compared with the planes in use early in the war, the newest type could carry 20 times the load for eight times the distance at a speed approaching 100 miles per hour.[2] At the same time there was a rapid growth in the size and destructive power of aerial bombs; bombs up to 1½ tons in weight were being manufactured, while the later designs were much simpler, cheaper and easier to manufacture than the earlier designs. The introduction of bomb-sighting gears made much greater accuracy possible. In October, 1918, 1,700 tons of aerial bombs were being produced every week, and arrangements had been made to attack from the air every industrial and political centre in Germany. The scale of the Ministry's effort can be realised from the fact that the annual cost of the supplies it provided for the Air Force in 1918 was estimated at £113,000,000.[3]

IX. Demobilisation.

The question of demobilisation and reconstruction had occupied the Ministry since April, 1917, when a Reconstruction Department and a Reconstruction Committee, formed by Dr. Addison, began to collect information as to the demobilisation of the headquarters staff, the operation of the break clause in Ministry contracts, the sale of surplus stores, and so on. After Dr. Addison left the Ministry to become Minister of Reconstruction, Mr. Churchill appointed a Demobilisation and Reconstruction Committee as a standing committee of the Munitions Council (3 November, 1917). In Mr. Churchill's view the Ministry of Reconstruction was responsible for "the general application of war industry to peace industry," and for the preparation of a general scheme for the utilisation of munitions labour on the conclusion of peace; while the Demobilisation and Reconstruction Committee was charged with the duty of providing the Minister of Reconstruction with information as to the firms and industries under its control and with suggestions as to the alternative forms of production which could be substituted on the cessation of hostilities.[4] By agreement with Dr. Addison, the Ministry Committee limited itself to the arrangements to be made in the transitional period, while all larger questions of future policy were left to the Ministry of Reconstruction, with which, in consultation with the Ministry of Labour, rested the responsibility for making plans for

[1] Speech by Lord Weir, 15 March, 1919.
[2] *Parliamentary Debates*, loc. cit.
[3] *Ibid.*
[4] Minute dated 16 February, 1918.

labour demobilisation, including such questions as the fulfilment of pledges for the restoration of trade union practices and the treatment of diluted labour. The Ministry therefore was not responsible for the reinstatement of labour in civil work or for framing plans to effect this object.

During the twelve months between its appointment and the Armistice, the Demobilisation and Reconstruction Committee collected a great deal of valuable information both on industrial development during the war and on the problems of the transition period. An estimate of the probable post-war supply of the raw materials of industry indicated, in the case of steel, a probable excess of supply over demand especially for the first six months after the war. An estimate was also made of the number of contracts which would probably be running at the termination of hostilities.

As it was anticipated that Government control of industry would be continued for some time after hostilities ended, priority orders were drafted which would give a definite priority to the maintenance and conversion of industrial plant, jigs and tools in the United Kingdom during the transition period, but this policy was not maintained after the Armistice, and all priority classifications were swept away, save for a few exceptional cases in which priority was required for national reasons.

An inquiry into the extent to which munitions firms were engaged upon work very similar to their normal peace-time production afforded ground for hoping that the dislocation caused by the return to peace conditions might be less serious than was generally supposed. It was estimated that over 1,000,000 persons, rather more than half of whom were males, were employed upon destructive munitions and would be thrown out of work when hostilities ceased, while another 500,000 men and over 100,000 women, who were employed as dilutees upon work that could be used for civilian purposes, would have to find other work if Trade Union pledges were carried out.

Summarising the results of its inquiries, the Committee laid stress upon the need for authoritative decisions on certain outstanding questions of policy which would govern administration after the cessation of hostilities. The principal problems were (*a*) the post-war use of national factories; (*b*) the future requirements for munitions; (*c*) the administration of priority during the transition from war to peace production; (*d*) the formation of a Ministry of Supply.[1]

By the date of the Armistice certain definite and interdependent principles had been accepted by the War Cabinet—firstly, that the production of useless munitions was to be terminated at the earliest possible moment in order to hasten the turn-over to peace production and enable raw materials to be diverted to industrial purposes; and secondly, that unemployment allowances would be paid to workpeople during the period of transition from war industry to peace industry. The main policy of the Ministry then, in the weeks which followed the

[1] *Report of the Munitions Council Committee on Demobilisation and Reconstruction for Year ending 30 September, 1918.* Copy in HIST. REC. R/264.2/3.

Armistice, was to wind up the commercial activities of the Ministry as quickly as possible, to terminate the manufacture of munitions, to wind up outstanding contracts, to dispose of all surplus government factories, to relax priority restrictions and free metals and raw materials from control.

The suggestion that the national factories might be used to mitigate unemployment during the transition period by manufacturing industrial products for the British or Dominion Governments or for local authorities did not commend itself either to the Minister of Munitions or to the Cabinet. To convert a large factory to the manufacture of some industrial product would take from three to nine months, during which period there would be some employment for skilled workmen but little or no work for the large body of unskilled or semi-skilled workpeople whose employment was the chief problem. It was therefore decided that the bulk of national factories should be disposed of as soon as possible by lease or sale to private firms, subject in some cases to the condition that government plant was to be kept intact. The manufacture of munitions was not to be continued a day longer than was absolutely necessary and economically justifiable.[1]

> "To act otherwise would be to delay the turn-over from war industry to peace industry, and would involve the waste on the production of useless munitions of materials that will be urgently required for all kinds of commercial and industrial work. In the case of some stores . . . . . it will be more economical to complete the articles that have passed a certain stage in manufacture, but . . . . . the manufacture of the great bulk of the ordinary munitions of war should be cut short at the earliest possible moment, and the articles in process of manufacture scrapped."

This action would lead to the most rapid transfer of labour and manufacturing capacity to the normal products of peace, but it was recognised that the termination of a large number of contracts at short notice would aggravate the problem of unemployment during the transitional period. The Treasury decided that, though all contracts were to be closed on a strict business basis, the arrears due to the Ministry for materials supplied, which amounted to about £40,000,000, were not to be harshly collected. A special policy was also to be adopted with regard to those key industries which were financially weak.[2]

Most of the materials required by industry were controlled by the Ministry at the date of the Armistice, and in order to help firms to turn over from war industry such materials were freed from control as soon as possible. Owing to the existence of Government subsidies, iron and steel were being sold at an artificially low price, and it was decided that, in order to minimise the shock to the trade and encourage the placing of orders for iron and steel goods, subsidies should be

[1] Memo. on Industrial Demobilisation, 1 October, 1918.
[2] Meeting with Heads of Departments, 11 November, 1918.

gradually withdrawn in two stages, and that prices should find their natural level by 1 May, 1919.[1] The large stocks of non-ferrous materials, explosives materials, and fertilisers owned by the Ministry were to be put on the market at prices which would tend to encourage trade, and Government material lying in the yards of private firms was to be released for peace work as soon as possible.

The fact that the Ministry was already responsible for disposing of these stocks of munitions material led to the decision (December, 1918) that it was also to be entrusted with the responsibility of disposing of surplus war stores of enormous value belonging to all Government Departments—the War Office, the Admiralty, and the Air Ministry—at home, abroad, and in every theatre of war. It was not an easy matter to get the best prices for the State without discouraging industry and delaying its revival by throwing masses of new or part-worn surplus products on the market.

In Mr. Churchill's words,[2] it constituted

> "one of the most intricate business problems that has ever been set, and it will certainly not be solved by any sweeping methods. It requires detailed and prolonged treatment and great care at every stage to hold the balance evenly between the financial interests of the State and the claims of reviving peace industry. Recklessly handled, the disposal of surplus stores might be an instance of dumping on a scale never before witnessed at any stage of the country's history."

Mr. Churchill hoped that Government Departments, Colonial Governments, and local authorities would place as many orders as possible through the Ministry in order to develop industrial production during the transition period.[3]

The central problem was, of course, a labour problem, and Mr. Churchill took a very grave view of the difficulties and dangers of the situation.[4]

> "However much you have prepared, you cannot get over the fact that millions of people have got to change their way of getting their living . . . . . in the next months. Then, during the war wages have been driven up by high prices and by the scarcity of labour to an extraordinary level, and that produces a profound effect upon the possibilities of reviving competitive peace production. Then, on top of this, home are coming the armies, at, I hope, no distant date, discharging upon the labour market 20,000 or 30,000 men a day once the process of demobilisation has begun. We have in addition the great question of the position of women in industrial life,

---

[1] For a full account of this see Vol. VII, Part II, Chap. VI.
[2] Meeting with Trade Unions and Employers' Advisory Committee, 21 December, 1918.
[3] Conference with Railway Executive, 3 December, 1918.
[4] Meeting with Press representatives, 14 November, 1918.

and their relationship to the men who have vested interests, particularly in the skilled branches of production. You have the income of the country being spent at the rate of so many thousand millions a year, mortgaging the future, melting down the thrift of whole generations in a year or two. That is going to stop, and we must prepare ourselves for a shrinkage, a dwindling and a contraction."

It was difficult to reconcile the necessity for stopping munitions work with the desirability of avoiding wholesale dismissals and tiding over a very dangerous period.[1]

"Nothing could be easier than for the Ministry of Munitions to throw, by a single stroke, great masses of people into the street with grievances. The difficulty is to prevent this and make the discharges gradual, so as to feed the labour market with what it can absorb, and just a little more than it can absorb, and to do this without waste of valuable material while all the time relaxing control and stimulating alternative forms of production. That is a process which requires care, patience, method, and hard work. It is not a process which can possibly be solved simply by breezy and unrestricted hustling."

In order to avoid the necessity for wholesale dismissals, steps were taken to reduce overtime and to reduce the number of hours in the working week, etc., so as to spread the available employment amongst as many workers as possible. Free railway warrants were issued by the Employment Exchanges to enable discharged persons to return home or to take up fresh employment, and all war munition Volunteers and other munitions workers were released from their obligations in order that they might take up private work. A special unemployment benefit, at the rate of 30s. for men and 25s. for women, with allowances for children, was given for a period of 13 weeks and subsequently extended at a reduced rate for another period.

By the middle of January nearly 725,000 persons had been discharged from munitions production, and Labour Exchange figures showed that only 350,000 remained unemployed, while manufacture had ceased on 70 per cent. of the Ministry of Munitions contracts, the speedy winding up of which was a great financial achievement. Between 11 November and 31 December the number of contracts outstanding was reduced from 21,698 to 4,261,[2] and the commitment value had been reduced from £141,200,000 to £19,200,000, the latter figure including classes of supply still required by the War Office.

---

[1] Meeting with Trade Unions and Employers' Advisory Committee, 21 December.

[2] This excludes contracts for aircraft engines and explosives.

CHAPTER V.

GROWTH AND STRUCTURE OF THE DEPARTMENT.

I. Establishment of the Department.

During the months which preceded the establishment of the Ministry of Munitions in June, 1915, there had been manifested a growing sense of dissatisfaction with a system which left to a military department the exclusive responsibility for organising the munitions industries, and this feeling had led first to the creation of a non-military organisation—the Armaments Output Committee—within the War Office itself, and then to the setting up of a new ministerial authority—the Munitions of War Committee—which was equally responsible for guiding the industrial mobilisation of the country. The activities of these two bodies have been recorded in detail elsewhere.[1]

From the very beginning of the movement, the imagination of the business world had been captivated by the notion that the comparatively simple problem (as it then appeared) of the organisation of a certain class of manufacture could best be handled by a single man of business, with the assistance of an advisory committee of experts in engineering.

The committee type of organisation had been appropriate and fairly effective so long as the sole purpose was to tide over an emergency by stimulating the rapid production of certain natures of shell which were most urgently needed. But the prospects now opening out were of a much larger scope, and involved, as was pointed out by Sir John Simon in the House of Commons,[2] the general control both of industry and labour. This was manifestly a task beyond the powers of any committee. Accordingly, Sir H. Llewellyn Smith, in consultation with Sir Reginald Brade, drew up some proposals, which were taken as the basis of a memorandum[3] on the scope and function of the Ministry, prepared by Sir John Simon on 24 May. The principle laid down was that the department would need to be organised like an ordinary Government office, with a Permanent Secretary, and such branches and sub-departments, all responsible through the Permanent Secretary to the Minister, as circumstances and convenience might require.

The new department was formed from a nucleus of sections already working under the War Office.[4] The services to be transferred were defined in the official letter from the Ministry of Munitions to the War Office on 5 June, 1915, as follows :—

(1) Major-General Sir Percy Girouard, Mr. George Booth, and their staff ;

(2) The Contracts and Labour Branches of the Master-General of the Ordnance's department ;

(3) The High Explosives Department ;

---

[1] Vol. I, Part III.

[2] *Parliamentary Debates* (1915), *H. of C.*, LXXII, 91.

[3] Hist. Rec./R/200/3.

[4] See Appendix I.

(4) The Royal Ordnance Factories, for the purposes and within the limits explained below ;
(5) The Chief Inspector at Woolwich, the Chief Inspector of Small Arms, and their staff, so far as engaged upon inspection ;
and such other services as might thereafter be arranged.[1]

" Major-General Sir Percy Girouard, Mr. George Booth, and their staffs " referred to the organisation which had been developed during April and May to increase the output of munitions and which was already divided into sections dealing with shell manufacture, the supply of raw materials and the control of machine tools.[2] The Master-General of the Ordnance's Contracts Branch was the section in the Directorate of Artillery—A.7—responsible for the purchase of warlike stores and scientific instruments. The Labour Branch of the Master-General of the Ordnance's department—M.G.O. (L)—dealt with the issue of war service badges and certificates under the various schemes which had come into effect since March, 1915. The High Explosives Department had developed out of the independent committee appointed under Lord Moulton and, as A.6 (part of the Director of Artillery's department), had dealt with the supply of high explosives, whilst the control of the Royal Ordnance Factories and the inspection of munitions formed part of the usual work of the Master-General of the Ordnance's department.

The organisation under Sir Percy Girouard and Mr. Booth was incorporated in the new department at the outset. On 23 June, the Ministry of Munitions became responsible for the Master-General of the Ordnance's Contracts Branch (to which was added, in July, Contracts 3 from the Quartermaster-General's department, which dealt with contracts for metals, machinery, horse-drawn vehicles, electrical stores, and mechanical transport), for the High Explosives Department, and for Colonel Jackson's work in connection with trench warfare appliances,[3] which had not been specified in the original letter of transfer. The Chief Inspector, Woolwich, and the Chief Inspector of Small Arms and their staffs were taken over by the Ministry for the purposes of the transferred services from 5 July, subject to conditions which reserved to the War Office and the Admiralty the fixing of designs, specifications and tests, research and experimental work. The Labour Branch of the Master-General of the Ordnance's department was also transferred at the beginning of July, and, with the section organised under Sir Percy Girouard and Mr. Booth to deal with release from the Colours, it formed the nucleus of the Labour Department.[4] The administration of the Royal Ordnance Factories was not taken over until 23 August. The delay was due to certain financial considerations, and it was at one time suggested that whilst the new department should regulate the distribution of munitions orders, the War Office should retain the actual management of the Royal Ordnance Factories and the control of expenditure and accounts. With regard to general financial questions, it was decided that the responsibility of the Ministry of Munitions should be limited to the payment of salaries and of expenses incurred

[1] M.W. 1374.
[2] See Vol. I, Part III.
[3] F.W. 3 (A), See Appendix I.
[4] M.W. 6202—B. 11496.

under the Munitions of War Act, but it was agreed with the Army Council that the services of Mr. (later Sir Sigmund) Dannreuther, who was responsible for the Master-General of the Ordnance's Finance Branch dealing with munitions expenditure, should be available to the new department.

The Ministry, as constituted from the foregoing elements, was divided into four departments, under the supervision of the General Secretary, Sir H. Llewellyn Smith :—

(1) The Secretariat and Labour Department was in charge of Mr. (later Sir William) Beveridge as Assistant General Secretary.

(2) Sir Percy Girouard was invited to take charge of the Munitions Supply Department, as Director-General of Munitions Supply.

(3) The Explosives Supply Department, of which Lord Moulton became Director-General, was under the immediate supervision of Mr. (later Sir Sothern) Holland, as Deputy Director-General.

(4) The Trench Warfare Supply Department, or Engineer Munitions Department as it was at first called, was under Colonel (later Brig.-General Sir Louis) Jackson as Director.[1]

It was at first intended to perpetuate the Munitions of War Committee, with a slightly altered membership, as an advisory and co-ordinating body; but it apparently proved too unwieldy for practical administration, and after one meeting on 23 July it ceased to exist. This left the task of co-ordinating the activities of the different departments entirely in the hands of the Minister and his Parliamentary and General Secretaries—a difficult problem owing to the number of independent sections which soon developed and the importance attached to the right of direct access to the Minister. From August, 1915, a Weekly Report summarising the activities of the different branches was circulated to the principal officers. Meetings of heads of departments were held weekly from the end of December, 1915, to the middle of February, 1916, and from August of the same year these meetings became a fortnightly occurrence with a carefully prepared agenda and circulated minutes. In August, 1916, when the Munitions Supply Department included ten independent branches, and separate Labour, Finance, Design, Inspection, and Inventions Departments had been added to the four original departments, an Advisory Committee was appointed to advise and report to the Minister on matters of importance referred to it by the Minister or his Parliamentary Secretaries. This body had no executive functions, however, and it was expressly laid down that it was in no way to interfere with the existing relations between the Minister and his executive officers. A more radical change took place in August, 1917, when Mr. Churchill appointed the Munitions Council and the departments of the Ministry were divided into eleven groups, as far as possible according to a common purpose, with a Member of Council in charge of each. The details of this central

[1] For the organisation of the Ministry on 1 July, 1915, see Appendix II.

organisation are given elsewhere,[1] and the following sections aim only at tracing the development of the different departments of the Ministry.

II. Secretariat.

(*a*) General Organisation.

During the first nine months of its existence the Secretariat of the Ministry of Munitions, in addition to general questions of administrative control common to the Secretariat of all Government Departments, was responsible for the administration of the Munitions of War Act. This involved the declaration of controlled establishments, the limitation of profits, and the regulation of labour by such means as leaving certificates, works rules, and munitions tribunals. For this purpose the General Secretary, Sir H. Llewellyn Smith, assisted by Mr. W. H. Beveridge, had formed a small branch manned chiefly by civil servants, which was housed at 6, Whitehall Gardens, in close communication with the Minister and the Parliamentary Secretary and which had at first little connection with the supply departments.

By 1 July, 1915, the Secretariat was already divided into five branches,[2] three of which were entirely concerned with labour questions, and will be dealt with later.[3] Of the remaining branches, Section "B," under Mr. D. O. Malcolm, was responsible for the administration of the Defence of the Realm Acts and Regulations in so far as they concerned the Ministry, and for correspondence with the French Commission of Munitions and with other Government Departments. Section "E," under Mr. P. G. L. Webb, dealt with establishment matters and included a finance section, responsible for the payment of salaries in the Secretariat and for the expenditure incurred by the labour sections. It had no control, however, over minor appointments beyond Whitehall Gardens, as each of the supply departments had its own establishment and finance sections. On 19 July, a further Section "G," or the Department of Requirements and Statistics, was formed under Mr. W. T. Layton, formerly Director of Statistics in the Munitions Supply Department, to formulate the demands received from the War Office, to watch the progress of production, and to prepare statistics of stocks and deliveries.[4]

At the end of December, 1915, it was decided to take over the Hotel Metropole and to consolidate the labour sections of the Ministry at Whitehall Gardens. This led to the transfer of the Minister and his staff to Whitehall Place early in 1916, where he was followed on 10 and 23 March respectively by the Requirements and Statistics Branch and by that part of Section "B," under Mr. R. V. Vernon, which dealt with official correspondence, parliamentary and legal questions, housing construction[5] and welfare,[6] and had become known as the Parliamentary and General Branch.

---

[1] For further details see Chapter VI.

[2] See Appendix II. [3] See below, p. 115. [4] See below, p. 113.

[5] A Director of Housing Construction (Mr. H. Holloway) was appointed in Section "B" on 29 October, 1915.

[6] Mr. B. S. Rowntree was appointed to take charge of a Welfare Section on 27 December, 1915.

This separation of the Secretariat from the Labour Department placed the former in a more independent position and brought it into closer contact with the supply departments. The change was emphasised by the appointment of Mr. (later Sir Edmund) Phipps as a second General Secretary to assist Sir H. Llewellyn Smith, whose increased duties in connection with the Board of Trade were occupying a considerable part of his time. In addition to questions of policy relating to certain of the supply and design departments, Mr. Phipps became responsible for the branches transferred from Whitehall Gardens, and to these was added on 1 April a Central Establishment Branch. Before his appointment as General Secretary, Mr. Phipps had undertaken an inquiry into the methods of appointing and controlling staff throughout the Ministry,[1] and the formation of this Central Establishment Branch, under the direction of Mr. R. H. Carr, was an attempt to carry out his recommendations that a uniform method of dealing with staff should be adopted. Henceforth, the separate establishment sections became part of Mr. Carr's branch, in the same way as finance sections were responsible to the Assistant Financial Secretary.

Thus by 1 July, 1916, the Secretariat consisted of three branches dealing with Parliamentary and General questions, Establishment, and Requirements and Statistics.[2] On 18 October, 1916, a Special Intelligence Branch was formed under Sir Hedley le Bas to deal with questions of publicity. This involved arrangements for visits to national factories and munition works by English and foreign journalists,[3] and the preparation of articles for the press emphasising the important aspects of munitions work.

This organisation of the Secretariat remained in force until August, 1917, when the reorganisation of the Ministry under the Munitions Council[4] did much to strengthen the Secretariat. As a result of the new arrangement the Secretariat Group, under Sir W. Graham Greene, who had succeeded Mr. Phipps as Secretary,[5] consisted of the following departments :—

Council Secretariat, under Sir James Masterton-Smith, who was appointed Assistant Secretary in September, 1917.

Parliamentary and General Department, including Reconstruction,[6] under Mr. H. H. Piggott, who had succeeded Mr. R. V. Vernon as an Assistant Secretary.

---

[1] See Appendix VI.

[2] See Appendix III. The Secretariat also included a representative of the Imperial Munitions Board, who was appointed in December, 1915, to act as a liaison officer between the departments at headquarters and the organisation in Canada. See Vol. II, Part IV.

[3] M/K/065.

[4] See below, Chapter VI.

[5] From this date the title of "Secretary" was substituted for that of "General Secretary."

[6] A small Reconstruction Branch was established in April, 1917, to assist the Reconstruction Committee appointed by Dr. Addison in the work of collecting and considering reports and formulating questionnaires. This Committee was superseded on 3 November, 1917, by a Standing Committee of the Munitions Council on Demobilisation and Reconstruction under the chairmanship of Sir James Stevenson, and from that date the Reconstruction Department assumed greater responsibility for the preparation of memoranda and the conducting of inquiries.

Requirements and Statistics Department, under Mr. W. T. Layton.

Establishment Department, under Mr. J. W. Dulanty as Assistant Secretary in succession to Mr. R. H. Carr.

Special Intelligence Branch, under Sir Hedley le Bas.

Legal Assistants, under Mr. Chetham Strode.

Priority Department, under Mr. (later Sir Edgar) Jones, M.P.[1]

American Branch, under Mr. (later Sir Philip) Hanson, formerly Director of Munitions Contracts.[2]

In November, Mr. W. T. Layton was appointed an Additional Member of Council "R" for Requirements, and the Secretariat thus became two cognate groups, the "R" Group being subsequently organised in three departments—Requirements, Statistics, and the North American Branch.

The Council Secretariat consisted of the Chief Council Officer and the Secretarial Officers who were attached to each group of departments as organised under the Munitions Council. These officers were, with two exceptions, permanent civil servants and their chief duty was to regulate procedure for the transmission of documents on current business and to secure the necessary interchange of information between the groups.[3] The Secretarial Officers met in daily conference, and a Daily Report[4] was issued to heads of departments containing memoranda on questions submitted to Members of Council and summaries of important letters and documents. This system centralised information in the Secretariat, and the influence of the Secretarial Officers produced greater uniformity in procedure throughout the Ministry.

The gradual strengthening of the Secretariat through the Munitions Council and its Secretarial Officers continued throughout 1918. Otherwise, the only changes in organisation were due to the expansion of work. On 15 May, 1918, a separate Historical Records Branch, hitherto part of the Department of Requirements and Statistics, was formed under Mr. G. I. H. Lloyd to compile a record of the work and organisation of the Ministry of Munitions. In June of the same year the Demobilisation and Reconstruction Branch was separated from the Parliamentary and General Department.[5]

---

[1] See below, p. 114.

[2] The American Branch was formed in September, 1917, to co-ordinate the action of the different departments obtaining supplies from America and to secure proper co-operation with the various agents and officers in the United States. The branch was responsible for the transmission of all cables, the preparation of statistics, and arrangements with regard to tonnage and transport.

[3] It had been proposed that the Secretarial Officers should be of the rank of Assistant Secretaries, in which case they would have undertaken the direct co-ordination of departmental action.

[4] From January, 1918, a weekly Summary of Official Correspondence, containing précises of the more important letters dispatched and received, was also prepared for limited circulation.

[5] See Appendix V.

(*b*) Department of Requirements and Statistics.

The Department of Requirements and Statistics was established to formulate and distribute the War Office requirements and to prepare co-ordinated statistics of stocks and output. Mr. W. T. Layton, who had already acted as statistical expert for both the Munitions of War Committee and for Mr. Lloyd George, was appointed Director of the branch, which became part of the Secretariat on 19 July, 1915.[1] Its duties were summarised in a letter to the Army Council on 23 July :

1. " To receive all demands for munitions put forward by the War Office, and to act as a distributing channel to the various departments of the Ministry concerned."
2. To serve as the medium " through which all statements of deliveries from contractors, issues to the front, issues overseas, etc., and ammunition on lines of communication should be sent."[2]

This procedure was only gradually established, but the process of centralisation was accelerated by the transfer of the Requirements and Statistics Branch to Whitehall Place in March, 1916, where it came into closer touch with the supply departments, and on 1 July, 1916, its functions were more clearly defined.[3]

On 20 January, 1917, after consideration by the Advisory Committee,[4] all statistics throughout the Ministry were placed under the immediate supervision of the Director of Requirements and Statistics. A Central Statistical Branch of his department was formed to co-ordinate the work of the different sections dealing with statistics, and arrangements were made for weekly statistical conferences to prevent overlapping or divergent forms of presentation.[5] A section was also formed under Mr. H. A. Fortington to act as a minor requirements and statistics branch for the Raw Materials Departments and to deal with interdepartmental requisitions.

At the beginning of April, 1917, an Allies Branch was established to deal with all preliminary negotiations as well as formal requisitions for supplies to the Allies. Hitherto this work had been divided between

---

[1] D.M.R.S./88.

[2] 1/Gen. No./1553. *Summary of Official Correspondence*, Part I, p. 12. In addition to this work, from August, 1915, the branch undertook the preparation of a Weekly Report for circulation to heads of departments, containing a summary of the reports received from the different departments and statistics of deliveries, inspection, and issues to France. In its final form the Weekly Report contained : (*a*) a series of brief departmental reports ; (*b*) statistical tables ; (*c*) lists of requirements received and contracts placed during the previous week ; (*d*) monthly supplement showing relative urgency of munitions. From the summer of 1917, a Weekly Review was also prepared for the use of the Minister and Members of Council, containing a brief summary of the Ministry position, and drawing attention to salient facts of demands, over-production, etc.

[3] General Procedure Minute, No. 16.

[4] See above, p. 109.

[5] Hist. Rec./R/264.1/1. General Procedure Minute, No. 68.

the Requirements and Statistics Department, the Commission Internationale de Ravitaillement (C.I.R), and Deputy Director-General (B)'s department.[1] The small section of C.I.R. housed in the Ministry was accordingly transferred to Mr. Layton's department, and Mr. Booth ceased to act as an intermediary except in special cases connected with Russian supplies.[2]

In July, 1917, the department was reorganised under five directors, responsible for the following branches :—

British Branch.—Requirements and necessary correspondence with War Office and other Departments.

Allied Branch.—Preliminary negotiations and requisitions for Allies.

Interdepartmental Branch.—Requirements and statistics for metals, materials, and explosives.

Central Statistical Branch.

Reports and Records Branch.[3]

(*c*) PRIORITY DEPARTMENT.

The Priority Branch was formed in August, 1915, as part of the Munitions Supply Department, under Deputy Director-General (B), to co-ordinate the action of different departments with regard to priority and relative urgency. A small section—the Sub-Contractors Section—which had already been established in Deputy Director-General (A)'s department to collect information concerning sub-contractors, was incorporated with it.

The branch was assisted in its work by a Priority Committee, which met daily to consider and decide upon applications for priority. This Committee as appointed in September, 1915, consisted of representatives of different departments in the Ministry, and representatives of other Government Departments were subsequently added. As the work increased, sub-committees were formed to deal with such questions as railway materials, gas plant, textile machinery.[4]

The work of the branch was greatly increased in June, 1916, when the administration of circular L.33, which contained instructions for the classification of munition work according to its relative urgency, was taken over from the Controlled Establishments Division of the Labour Department.[5]

At the beginning of 1917, the whole problem of priority administration was considered by the Advisory Committee, and on 24 February the branch became an independent Priority Department, directly responsible to the Minister through his Parliamentary Secretaries. At the same time, a Priority Advisory Committee was appointed to consider the rationing of supplies to private industries.[5] In the reorganisation under the Munitions Council in August, 1917, the department became part of the Secretarial Group.

---

[1] See below, p. 140. [2] D.M.R.S./407A. [3] General Memorandum, No. 12.
[4] HIST. REC./H/620/1. [5] HIST. REC./H/620/6.

During 1918 various schemes for the administration of inter-departmental priority were considered, but it was decided to retain the Priority Department of the Ministry of Munitions, which henceforth worked in close co-operation with the War Priorities Committee, appointed in September, 1917, and with the Joint Priorities Board, which was established in October, 1918.[1]

III. Labour Departments.

The labour sections of the Ministry of Munitions were, from the first, in close touch with the Board of Trade, which was also housed at Whitehall Gardens. The General Secretary, Sir H. Llewellyn Smith, and the Assistant General Secretary, Mr. W. H. Beveridge, who devoted much of their time to labour policy and administration, still maintained their connection with the Board of Trade. Similarly, Mr. C. F. Rey, when he became Director of Labour Supply, retained his position as General Manager of Labour Exchanges. This was of considerable importance, as it was the Board of Trade which had hitherto been concerned with the supply of labour and the negotiations with Trade Unions, and the information and organisation already developed for dealing with these questions was thus placed at the disposal of the new department.

The Ministry did not entirely control the labour required to ensure the supplies for which it was responsible. The Board of Trade retained the management of the Labour Exchanges and the settlement of trade disputes through the Chief Industrial Commissioner's Department. The miners' objection to inclusion under the Munitions of War Act left the production of the basic materials of munitions outside the purview of the Ministry. Also, the administration of the Factory Acts remained with the Home Office. On the other hand, the powers conferred by Parliament on the Ministry to control establishments carrying on the manufacture and repair of any articles required for use in war, and of the metals, machines and tools required for their manufacture and repair, to limit their profits and regulate their work, to restrict the free movement of workmen engaged on munitions work of certain kinds, and to limit the recruiting of persons employed on work for war purposes,[2] extended the responsibility of the Ministry for the control of labour to establishments which were working for the Admiralty and the War Office.

The activities of the Labour Department of the Ministry fall into two main classes: Supply and Regulation. In order to raise the war efficiency of the nation to the highest power, it was necessary to transfer men from commercial to war work, and from places where they were less useful to places where full advantage could be taken of their skill, to release skilled men from the Colours, and to bring over mechanics from the Dominions and from allied and neutral countries, to train the unskilled for special operations, and, above

[1] For further details see Vol. VII, Part 1.

[2] See below, Chap. VII.

all, to reorganise the workshops in such a way as to make use of the great body of men and women inexperienced in the munition industries, but eager to render the best war service of which they were capable. But the policy of dilution could not be carried out unless the rules and customs of the trade unions restricting output and employment were suspended. In order to ensure the most efficient organisation of labour it was necessary for the Ministry to control the principal establishments, securing in return for the limitation of profits the surrender by workmen of the right to strike and the liberty to leave, the relaxation of all restrictive practices, and the legal enforcement of workshop rules. Finally, it was necessary to prevent, if possible, the men indispensable for the production of munitions from undertaking military service.

At first the limits of responsibility and the relations of sections and subsections were ill-defined. Functions were transferred from one section to another as seemed most convenient, and new branches were formed to solve fresh problems as they arose. The relations between Whitehall Gardens and Armament Buildings were equally indeterminate, and for some weeks the Director-General of Munitions Supply had his own labour section,[1] and it was suggested that dilution should be dealt with in conjunction with shell manufacture.[2] It was only gradually that the department resolved itself into two main branches dealing with supply and regulation, each with its appropriate sections.

Until the beginning of March, 1916, the Labour Department, as already stated, formed part of the Secretariat, and in July, 1915, there were four sections dealing with Labour questions :—

Section A, under Mr. C. F. Rey, had begun work in June as the Munition Workers' Enrolment Department to deal with the enrolment and allocation of war munition volunteers. It also included a section under Major Scott, responsible for the work connected with the release of men from the Colours. This branch had been formed at the War Office under Sir Percy Girouard and Mr. Booth and transferred with other services in June, and consequently Major Scott held a somewhat independent position.

Section B, under Mr. D. O. Malcolm, was concerned, in common with several other sections, with the preliminary negotiations relating to war service badges. On 26 July, 1915, when the M.G.O. (L) Branch from the War Office was incorporated in the Labour Department,[3] Mr. W. G. S. Adams, who had been dealing with this question as an officer in the Munitions Supply Department, was placed in charge of the Badges Section, which became part of Section "B." His position was, however, very independent, and in October he became more closely associated with Mr. Rey's branch.

---

[1] Part of Deputy Director-General (B)'s Division.

[2] Deputy Director-General (A)'s Division.

[3] See above, p.108.

Section C, under Mr. Owen Smith, undertook the declaration of Controlled Establishments and the limitation of profits.[1]

Section D was in charge of Mr. H. Wolfe. One subsection dealt with questions of law and legislation, advising on the simpler cases and preparing the more difficult and important for transmission to the Treasury Solicitor for his advice. Another corresponded with Munitions Tribunals; a third handled questions relating to leaving certificates; and a fourth dealt with complaints and disputes about overtime and holidays, trade union restrictions, and the employers' obligation to conform to the regulations in the second schedule of the Munitions of War Act, 1915.

The National Advisory Committee appointed in March, 1915, to facilitate the execution of the Treasury Agreement had rooms at 6, Whitehall Gardens, and was in constant touch with the Ministry. In September, two other Committees were appointed—the Health of Munition Workers Committee, under the chairmanship of Sir George Newman, to advise on matters affecting physical health and efficiency of workers, and the Central Munitions Labour Supply Committee, under the chairmanship of Mr. Arthur Henderson, to advise and assist the Ministry on questions of dilution.

In May, 1916, the Labour Department was separated from the Secretariat, and on 1 July, 1916, it comprised three divisions, each in charge of an Assistant General Secretary.[2]

The "A" Division, or the Labour Regulation Department, under Mr. Beveridge, was divided into five sections, dealing with (1) legal and general questions, (2) badges, (3) wages, (4) time-keeping, and (5) records. The Wages Section, under Mr. J. C. Smith, had been formed in October, 1915, to deal with questions relating to wages, including the administration of the Fair Wages Clause and the changes of wages in controlled establishments. This work was almost immediately increased by the administration of Circulars L.2 and L.3. The Timekeeping Section under Sir Maurice Levy had been established in January, 1916, to deal with all questions relating to time-keeping in controlled establishments. The Intelligence and Records Section, for which Mr. J. Chartres was responsible, had originally formed part of Mr. Booth's organisation at the War Office. After its transfer to the Ministry of Munitions it became part first of Deputy Director-General (B)'s department and then of the Requirements and Statistics Branch. When the latter was transferred to Whitehall Place, it remained to deal with records and information on labour topics.

---

[1] In April, 1916, Mr. Owen Smith became responsible for all dealings with Controlled Establishments, including changes in wages, hours and works rules. This involved a division of responsibility, as Mr. Wolfe's section was already dealing with these questions. There is no evidence as to the extent to which this was carried out, and on 22 August these matters were re-transferred to the Labour Regulation Department. M.W. 96436.

[2] See Appendix III.

The " B " Division, or the Labour Supply Department, under Mr. C. F. Rey, was responsible for (1) dilution, (2) training, (3) release from the Colours, (4) war munitions volunteers, and (5) Belgian labour. This branch, first known as the Munition Workers Enrolment Department, had been reorganised in November, 1915, when it became obvious that the war munition volunteers scheme had failed to secure the necessary supply of mobile labour, and the policy of dilution was adopted. For a short time, Lord Murray of Elibank had been appointed to act as Director-General of Recruiting for Munition Work, and a new section, which ultimately came under Mr. (afterwards Sir Stephenson) Kent, was formed to deal with questions of dilution and the allocation of labour. The Training Section under Mr. T. M. Taylor had been formed in September, 1915, to administer the schemes for the training of munition workers at technical institutes or other suitable establishments. This section also dealt with the regulation of building labour and the issue of licences to proceed with constructional work. In this respect, it was assisted by a Building Labour Committee composed of representatives of the departments interested in constructional work and of the Admiralty, War Office, and Office of Works, which held its first meeting on 28 October, 1915.[1] The Belgian Labour Section under Mr. Graham Spicer, which had been formed at the end of 1915, was occupied with the supply of labour for the National Projectile Factory at Birtley, which was worked by Belgians.

The " C," or Controlled Establishments Division, under Mr. Owen Smith, was responsible for the declaration of controlled establishments and the limitation of profits.

In October, 1916, Mr. Beveridge and Mr. Rey undertook fresh duties in their original office at the Board of Trade. Consequently, while remaining available for consultation on questions of policy, they relinquished their administrative duties in the Labour Department. Mr. Kent succeeded Mr. Rey with the title of Director-General of Munitions Labour Supply, and Mr. Wolfe succeeded Mr. Beveridge with the title of Deputy Assistant General Secretary to take charge of the Labour Regulation Department. A joint Committee, consisting of the four above-mentioned officials, Sir H. Llewellyn Smith (who at this date also returned to the Board of Trade), and Mr. Neil Primrose, Parliamentary Secretary to the Ministry, was set up to deal with any questions of overlapping and confusion between the two Departments.

The Controlled Establishments Division was transferred to Whitehall Place, where its functions became more and more limited to financial questions such as assessment and valuation, until in October, 1918, the work was finally transferred to the Inland Revenue Department.[2]

---

[1] The issue of building licences was transferred to the Ministry of National Service in January, 1918, and questions relating to wages in the building trade were henceforth dealt with by the Wages Section.

[2] General Memorandum, No. 135. A few minor responsibilities passed to the Labour Regulation and Finance Departments.

On the formation of the Munitions Council in August, 1917, Labour constituted a group under Sir Stephenson Kent, Member of Council L. The group comprised three departments: (1) the Labour Regulation Department under Mr. Wolfe as Controller, (2) the Labour Adviser's Department under Sir Thomas Munro, (3) the Labour Supply Department, which was divided into a Civil Division under the direction of Mr. T. M. Taylor, and a Military Division under the direction of Mr. J. A. N. Barlow.

Mr. Wolfe's department was divided into :—

(1) A General Section (Mr. R. H. H. Keenlyside), which dealt with the constitution and administration of Munitions Tribunals, complaints of victimisation and improper dismissal, the prohibition of races and fairs, holidays, time-keeping, Sunday labour and overtime, the records of changes in working conditions, and the supervision of the work of the local Investigation Officers.

(2) A Wages Section (Mr. C. H. G. Campbell), which sanctioned changes of wages and salaries in controlled establishments under Section 4 (2) of the Munitions of War Act, 1915, administered the Orders respecting time-workers made under Section 1 of the Amendment Act, 1917, and the Orders regulating women's wages made under Section 6 of the Amendment Act, 1916.

(3) A Section (Mr. A. F. Butler) which dealt with housing, health and welfare, canteens and the provision of food for munition workers.[1]

Sir Thomas Munro's department exercised a general surveillance over matters affecting the maintenance of industrial peace among munition workers, either advising the departments directly concerned or, if necessary, taking executive action.

Mr. Taylor's division of the Labour Supply Department comprised three sections responsible for :—

(1) Administering the War Munition Volunteer and Army Reserve Munition Worker schemes, and in particular authorising the payment of wages and allowances under those schemes (Mr. F. O. Mann).

(2) Supervising the training of women, discharged soldiers and men exempted from military service for munitions work (Mr. J. Currie).

(3) Promoting dilution, investigating demands for labour, supplying labour by the transfer of war munition volunteers and army reserve munition workers and supervising the work of the local Dilution Officers (Major W. T. David).

[1] These questions had been originally dealt with in the Secretariat. See p. 110. The Welfare Section had been transferred to the Labour Regulation Department at the end of 1916. The Housing Section was not transferred until the reorganisation of the Ministry under the Munitions Council. Questions relating to canteens were at first dealt with by the Central Control (Liquor Traffic) Board. In April, 1917, the work was transferred to the Ministry and a Canteens Finance Committee was formed. In February, 1918, a special Food Section was formed in the Labour Regulation Department, and the functions of the Committee were transferred to the Finance Department.

Mr. Barlow's division comprised four sections responsible for :—

(1) Dealing with the protection of munition workers from military service and administering the release of men for military service through the Munitions Area Recruiting Offices (Mr. G. P. Langton).

(2) Controlling the Labour Enlistment Complaints Committees and administering the scheme for the withdrawal of protection from military service for bad time-keeping (Mr. W. Mosses).[1]

(3) Dealing with release from the Colours for Admiralty and munitions work (Captain J. W. E. Avern).

(4) Supplying artificers to the Army and Navy, and preparing, revising and interpreting the Schedule of Protected Occupations (Mr. J. L. Mather).[2]

In addition, there were common to the three Labour Departments a Legal Branch under Mr. (later Sir John) Miles, and an Intelligence and Statistics Branch under Mr. J. Chartres.

IV. Finance Departments.

(*a*) Finance and Accounts Department.

When the Ministry was established, it was considered that the War Office, being the Department for which supplies were to be purchased, should make the necessary financial arrangements and should pay all bills for supplies furnished as a consequence of Ministry operations. The general principle agreed upon was that the responsibility of the Ministry of Munitions should be limited to the organisation and general control of supply and that all payments made to contractors and for the purpose of new factories for shell, explosives, arms or other munitions should be made and accounted for by the War Office.[3] Thus the only financial responsibility incurred by the Ministry of Munitions at its inception was that concerned with the payment of salaries and with special expenditure under the Munitions of War Act, and until 30 September, 1915, other payments were made from the War Office funds, Sir Charles Harris, Assistant Financial Secretary to the War Office, acting as Accounting Officer. It was, at the same time, agreed with the Army Council that the services of Mr. Dannreuther, who was then in charge of the Finance Branch of the Master General of the Ordnance Department, should be available to the new department for the purpose of arranging all details of finance. On 12 July he moved to Armament Buildings with a small finance and accounting staff of which he became Director (ranking as Deputy Director-General) and the branch, although actually under Sir Charles Harris as Director-General, was classified as under the Director-General of Munitions Supply.

---

[1] This section had been formed in December, 1916.

[2] This section had been formed in January, 1917.

[3] Ministry of Munitions letter of 5 June, 1915—M.W. 1374.

In September, Sir Charles Harris resigned his position as Accounting Officer to the Ministry, and Mr. Dannreuther was appointed Acting Accounting Officer. For the next month there was no financial authority in the Ministry independent of the Directors-General of the supply departments except the Parliamentary Secretary, Dr. Addison, who was devoting special attention to financial questions.

On 29 October, Mr. (later Sir Hardman) Lever, a chartered accountant, who had in August been brought into the Ministry to institute and organise arrangements for installing a general system of store records and of cost accounting, was appointed Assistant Financial Secretary with the status of Director-General.

The Finance Department as then organised had Mr. Dannreuther as Mr. Lever's Deputy and Director of Finance and Mr. O. T. Barrow as Director of Accounts, and consisted of the following divisions :—

M.F.1. General financial questions, estimates, liabilities, examination of contractors' bills, advances, loans, compensation, etc.

M.F.2. Salaries, allowances, etc., audit.

M.F.3. Explosives and propellants finance and accounts.

M.F.4. Payments, book-keeping, appropriation accounts.

Of these branches, M.F.3, which was responsible for explosives finance, was housed at Storey's Gate with the Explosives Supply Department.

The Contracts Branch remained under the Director-General of Munitions Supply, but Mr. Lever, as Assistant Financial Secretary, was to see and express his opinion upon, and be responsible for, sanctioning the financial terms of :—

(1) All contracts which involved capital expenditure or loans.

(2) Net cost contracts.

(3) All important contracts or undertakings involving an expenditure of £40,000 and upwards.

Thus Mr. Lever, as head of the Finance Department, controlled all the more important work of the Director of Contracts. In practice, however, he devoted himself particularly to the development of cost accounting as the surest method of ultimately reducing contract prices. He was assisted in the discharge of his duties by a committee known as the Finance Committee on Economy, appointed by the Cabinet in January, 1916, and consisting of himself as Chairman, Mr. (later Sir John) Mann, the Hon. Charles Rothschild, and Mr. Frederick Palmer,[1] none of these gentlemen, except Mr. Lever, holding at that date executive positions in the Ministry.

As the work of the Finance Department increased, new branches were formed to deal with new sections of the work: M.F.5 for stores accounting, M.F.6 for cost accounting and particularly to audit capital expenditure, M.F.7 (formed out of an M.F.1 nucleus) to deal

[1] General Office Notice, No. 11.

with the finance and accounts of trench warfare supply, M.F.8 to deal with the audit of national factories, M.F.9 to deal with the payment of officers' travelling expenses, M.F.10 to deal with the finance and accounts resulting from the operations of the Labour Department. The main burden of the finance and accounting work remained, however, in M.F.1 under the charge of Mr. Lambert Middleton and Mr. A. E. Watson, jointly as Assistant Directors of Munitions Finance. M.F. Materials was formed from M.F.1 in May, 1916, to deal with payments for materials. One of the greatest difficulties during 1915 and the whole of 1916 was the rapid expansion of work and the difficulty of obtaining staff and suitable accommodation. By July, 1916, the Finance Department was divided into ten branches employing a headquarters staff of over 300.

In December, 1916, Mr. Lever was appointed Financial Secretary to the Treasury and Mr. Mann succeeded him as Assistant Financial Secretary and Accounting Officer in the Ministry of Munitions. The Finance Department was then reorganised, Mr. Dannreuther becoming Director-General of Munitions Finance and Mr. F. Palmer Director-General of Contracts Finance. These two gentlemen were Mr. Mann's principal officers and had under them Mr. (later Sir Philip) Henriques as Deputy Director-General for Explosives Contracts and Finance and three Directors (ranking as Deputy Directors-General).[1]

The new department of Contracts Finance constituted under Mr. F. Palmer was organised to deal with the terms of contracts involving financial assistance to contractors for the purpose of making extensions to their factories. The method of financing contractors' extensions by means of allowances under the rules governing the Munitions Levy had come more and more into use, and the need was felt for some financial check on the bargains negotiated by the Controlled Establishments Division. The various supply departments were also embarking upon large schemes of factory construction. A Munitions Works Board was therefore established, with Mr. Palmer as Chairman, to control the terms of such contracts and to exercise a general supervision over the carrying out of the constructional work which was done for the Ministry, with special attention to finance, choice of site, design, materials, labour supply and priority between the various proposals. The Board contained representatives of the Labour Supply Department (Mr. W. J. Larke), the Lands Department (Sir Howard Frank, who also represented the Board of Agriculture) and the Office of Works (Mr. Frank Baines, Principal Architect).[2] At the same time (January, 1917) a Ministry Finance Board was appointed to co-ordinate the work of the Finance Department.[3]

---

[1] General Office Notice, No. 89. [2] General Procedure Minute, No. 69.

[3] The Finance Board consisted of the following members: the Assistant Financial Secretary, the two Directors-General (Mr. Dannreuther, Mr. Palmer), together with Mr. Henriques (Deputy Director-General for Explosives Contracts and Finance), Mr. J. Wormald and Mr. H. G. Judd (Directors of Contracts Finance), Mr. O. T. Barrow (Director of Munitions Accounts), and Mr. Webster Jenkinson (Director of Factory Accounting), each of these last-named having also the status of Deputy Director-General. Mr. A. E. Watson was Secretary to the Board and certain other members were subsequently added.

With Mr. Lever's departure and the constitution of the Ministry Finance Board, the Finance Committee on Economy became moribund and was shortly afterwards dissolved. Its more general functions were taken over by the Financial Advisory Committee which was formed in April, 1917, under the Chairmanship of Sir Clarendon Hyde (Vice-President of Messrs. S. Pearson & Sons, Ltd.), with the Assistant Financial Secretary (Mr. John Mann), the Assistant General Secretary in charge of the Controlled Establishments Branch (Mr. Owen H. Smith), Sir Alexander Roger, Mr. D. H. Allan (of Messrs. Harris, Allan & Co., Chartered Accountants), Mr. T. Redfern, Junior (of Messrs. Redfern, Hunt & Co., Solicitors), Mr. (later Sir Herbert) Hambling (General Manager of the London and South-Western Bank, Ltd.), and the Hon. N. C. Rothschild as members. This Committee continued its functions up to the date of the Armistice, but it was required to advise not only on questions referred to it by the Assistant Financial Secretary, but also on broad questions of financial policy referred to it by the Minister.

Concurrently, a reorganisation of the main finance and accounting branch (M.F.1) was undertaken. The finance duties were separated to form a new branch (D.F.1) under Mr. Middleton, and Mr. Guy, working under the Director of Munitions Accounts, was placed in charge of the remaining accounts work (still known as M.F.1). Considerable changes in the Ministry accounting system were introduced. A Reconciliation Committee was appointed in April, 1917, consisting of Mr. (later Sir Gilbert) Garnsey and Mr. J. H. Guy, with a view to securing agreement between the Ministry records and those of contractors. This work resulted in the formation of the Internal Audit Section, and Mr. Guy and Mr. Garnsey were asked to place the Ministry accounts on a complete commercial basis. Closely connected with this reorganisation was the formation of the Central Stores Branch.[1]

(*b*) Contracts Department.

The Contracts Branch of the Ministry was, at the outset, part of the Munitions Supply Department. The Director, Mr. P. Hanson, who was transferred from the War Office with a small staff at the end of June, 1915, was responsible for the work hitherto performed by the War Office branches Contracts 3 and A.7. In July the branch was divided into two sections—P.M.1 and P.M.2—roughly corresponding to the previous War Office divisions and responsible respectively for contracts dealing with (*a*) metals, machinery, transport vehicles, bicycles, and electrical stores, and (*b*) guns, shells, optical munitions and other warlike stores, excluding explosives and propellants. Explosives contracts were dealt with by the Explosives Finance Branch working in close co-operation with the supply branches and the legal advisers of the Explosives Supply Department. Trench warfare contracts were nominally under the Director of Munitions Contracts, but the contract officer was housed in the Trench Warfare Supply Department, and this section was practically autonomous until December, 1916, when it became more definitely part of the Contracts Branch.

[1] See below, p. 124.

The functions of the Contracts Branch varied from the actual supply of stores, such as accessories for small arms ammunition and minor materials, and the fixing of prices with the advice of the supply departments, to the mere preparation of the formal contract or the duty of ratification. As the work of the Ministry increased, additional sections were formed to deal with small arms and small arms ammunition, railway materials, aircraft supplies, etc., but, throughout, the principle was maintained that each section should deal with a certain class of goods and that the subdivisions of the department should correspond to distinct supply departments.

In March, 1917, the Contracts Department became definitely independent of the Munitions Supply Department, Mr. Hanson being appointed Director-General of Munitions Contracts. The Assistant Financial Secretary, however, continued to exercise the authority given to him in October, 1915, but the responsibilities of the Contracts Department were more clearly defined in an office notice of 22 February, 1918, in which it was stated that, subject to the powers of the Assistant Financial Secretary, the final responsibility for fixing prices rested with the Contracts Department, thus limiting the powers of supply officers.

(*c*) CENTRAL STORES DEPARTMENT.

In April, 1917, a Central Stores Branch was formed with Major the Hon. L. H. Cripps as Deputy Director-General, and although it was at first placed within the Munitions Supply Department, its origin may be traced to the general scheme for reorganising the accountancy of the Ministry. As Sir Frederick Black, the Director-General of Munitions Supply, was at this time in India and his office in commission, the Central Stores Branch was administered by a Board consisting of Sir H. Ross Skinner as Chairman, Major Cripps and his Deputy Mr. Kissane, with Mr. J. H. Guy, representing the Finance Department, as adviser.[1]

The branch was responsible for the storage, receipt and issue (including the relative stores accounting) of all goods requiring to be stored, whether from home production or overseas. It furnished the Finance Department with the information necessary to enable them to pay bills and prepare invoices for goods delivered into or issued from stores. The branch was responsible in conjunction with the Finance Department for methods of procedure in connection with stores accounting other than factory accounting, and no alterations in procedure affecting stores accounting might be instituted by any department without the approval of the Central Stores Branch and the Finance Department. The branch included :—

(*a*) The Storage Requirement Section.
(*b*) Inspection Bonds.
(*c*) The Munitions Stores Branch, established early in 1916 in the Gun Ammunition Filling Department for gun ammunition components and non-ferrous materials.
(*d*) Stores for non-ferrous materials.
(*e*) Stores for scrap metals.
(*f*) Any other Ministry stores, except those for explosives and trench warfare supplies.

[1] General Procedure Minute, No. 95.

At the formation of the Munitions Council the Central Stores Branch was included in Group F (Finance), and in November, 1917, it became part of a Salvage and Stores Department under Mr. Alexander Walker as Controller, which also included the Scrap Metals Branch, which had been formed in February, 1917.[1] During 1918 its functions were extended to include the discovery and utilisation of obsolete components and the disposal of surplus stores.[2]

(*d*) THE FINANCE GROUP.

When the departments of the Ministry were grouped under Members of Council in August, 1917, Sir Herbert Hambling, General Manager of the London and South Western Bank, Ltd., who was a member of the Financial Advisory Committee but not hitherto an executive officer of the Ministry, was appointed Member of Council for Finance.

The Finance Group as constituted consisted of the following departments :—

Finance Department.—Controller and Accounting Officer, Mr. S. Dannreuther. This department included contracts finance, factory and cost accounting, munitions accounts, munitions estimates, loans, salaries, etc., and explosives finance.

The Munitions Works Board.—Chairman, Mr. Palmer, succeeded by Mr. (later Sir James) Carmichael in October, 1917.

Controlled Establishments Department.—Assistant General Secretary, Mr. Owen Smith. This department was originally part of the Labour Department. In 1918 its functions were distributed between the Inland Revenue Department and the Commercial Finance and Labour Regulation Departments of the Ministry of Munitions.

Contracts Department.—Controller, Mr. J. Mann.

Central Stores Department.—Director, Major the Hon. L. H. Cripps.

Salvage Department.—Director, Capt. A. U. Greer. This branch was originally part of the Munitions Supply Department, first in Deputy Director-General (C)'s division and later in Deputy Director-General (E)'s division.

Lands Department.—(War Office and Ministry of Munitions)—Director-General, Sir Howard Frank. This was a department originally formed in the War Office which, from February, 1916, onwards, undertook the examination of draft contracts and draft deeds for the permanent acquisition of land and acted as the adviser of both Departments on all estate questions.

An important change made at the time of the establishment of the Munitions Council was the abolition of the post of Assistant Financial Secretary. Ever since Mr. Lever's appointment in October, 1918, the Assistant Financial Secretary had combined with his financial duties

---

[1] See below, p. 134.

[2] General Memoranda, Nos. 66–78.

responsibility for the more important types of contracts. This duality of functions had been criticised by the Select Committee on National Expenditure and was now abolished. Mr. Mann, formerly Assistant Financial Secretary, was appointed Controller of Contracts, succeeding Mr. Hanson, who became Director of the American Branch in the Secretariat, and the more independent position of the Contracts Department was emphasised in February, 1918, when its functions were re-defined and strengthened.[1]

In January, 1918, Sir Herbert Hambling was obliged to resign his membership of the Munitions Council owing to pressure of private business and no new Member for Finance was appointed. In February, 1918, partly in response to the criticisms of the Select Committee on National Expenditure, the Minister appointed Sir L. Worthington Evans, who was already Parliamentary Secretary, Financial Secretary to the Ministry, and he accordingly became responsible for the Finance Group. This appointment was in fact a reversion to the state of affairs during the first eighteen months of the life of the Ministry, when Dr. Addison, though formally Parliamentary Secretary, was especially responsible for financial questions. It also brought the Munitions Council more into line with the Army Council, on which the Finance Member was the Parliamentary Secretary.

During the weeks preceding 1 July, 1918, the Finance Group was reorganised. Mr. Dannreuther, Mr. Guy and Sir Philip Henriques were appointed Assistant Financial Secretaries, Mr. Dannreuther being Accounting Officer also, and the Department of Munitions Finance was divided into three main divisions :—

Commercial Finance.—Controller, Mr. H. Guedalla. This was the department formerly called Contracts Finance.

Departmental Finance.—Controller, Mr. A. E. Watson. This included sections dealing with wages of outside staff, workmen's compensation, estimates, financial statistics, drafts of Paymaster-General, store audit and stocktaking, finance questions arising from the administration of factories and other general matters.

Labour Finance.—Controller, Mr. G. H. Duckworth. This department was responsible for the finance and accounts connected with the Labour Department, including Housing and Welfare.

The remaining departments forming the Finance Group as reconstituted were :—

Aircraft Finance Department.—Controller, Mr. W. E. Mortimer.

Explosives Finance and Contracts Department.—Controller, Mr. F. G. Bowers.

Munitions Accounts Department.—Controller, Sir Gilbert Garnsey.

Factory Audit and Costs Department.—Controller, Mr. M. Webster Jenkinson.

[1] General Memorandum, No. 61.

Contracts Department.—Controller, Sir John Mann.

Salvage and Stores Department.—Controller, Mr. Alexander Walker.

Munitions Works Board.—Chairman, Mr. J. Carmichael.

In September, 1918, Mr. F. G. Kellaway succeeded Sir L. Worthington Evans as Parliamentary and Financial Secretary, and a Finance Committee under the chairmanship of Sir Gilbert Garnsey was appointed to secure co-ordination within the Finance Group.[1]

V. Design and other Technical Departments.

(*a*) Design Departments.

The responsibility for design was transferred to the Ministry of Munitions on 29 November, 1915. The change was regarded with some apprehension by the Army Council, who feared lest military considerations should suffer, and the Design Department was looked upon as the representative and guardian of military interests in the new Department.[2] This fact was emphasised in March, 1916, when the Director-General was appointed Military Adviser with direct access to the Minister[3]; and again in January, 1917, when the responsibility for establishment questions relating to military officers was transferred to the Design Department.[4]

The Design Department, as established at the beginning of December, 1915, was under the control of Major-General (later Lieut.-General Sir J. P.) Du Cane, C.B. (Director-General), who had acted as Director of the Experiments Committee appointed by Sir John French at General Headquarters in the previous summer. The department was divided into three branches under Deputy Directors-General :—

D.D.G. (I).—Brig.-General F. F. Minchin was responsible for inspection.

D.D.G. (O).—Lieut.-Colonel J. Byron, R.A., was responsible for the design of artillery ammunition, fuses and trench howitzer ammunition, guns, howitzers, trench mortars, carriages, mountings, transport vehicles, ammunition boxes, etc., sights and rangefinders.

D.D.G. (S).—Lieut.-Colonel F. J. Byrne was responsible for the design of grenades, fireworks, signal lights, etc., trench warfare appliances involving explosives, optical munitions other than telescopic sights, steel helmets and body shields, trench warfare supplies not involving explosives, rifles, pistols, machine guns and their ammunition and accessories, swords, lances, and bicycles.[5]

---

[1] For further details relating to Finance see Vol. III.
[2] Hist. Rec./H/800/1.
[3] General Office Notice, No. 4.
[4] General Procedure Minute, No. 63.
[5] D.G.M.S. Office Memorandum, No. 35.

At first there was some difficulty with regard to the design of trench warfare stores, the responsibility for which had been transferred to the Ministry as part of the Trench Warfare Supply Department in June, 1915. On 20 December, 1915, the Trench Warfare Research Department, under General Jackson, was separated from the Supply Department, and during the ensuing months it was gradually incorporated in the Design Department.[1]

In March, 1916, the branch dealing with inspection became an independent department, and by July the Design Department had adopted the form of organisation which, with the exception of the addition of the Military Establishment Branch, it retained until the end of 1917.[2] The Director-General of Munitions Design was the authority for all designs relating to artillery, small arms and trench warfare stores; but this responsibility did not extend to supplies for which the Ministry became responsible at a later date.[3] These were dealt with by independent design sections attached to the appropriate supply departments.

The Director-General was assisted in his work by the Ordnance Committee, which had replaced the Ordnance Board, and acted as a body of expert advisers on questions relating to guns, ammunition and explosives. The Munitions Design (Small Arms) Committee, the successor of the War Office Small Arms Committee, considered designs for small arms, machine guns and optical munitions, and the Munitions Design (Trench Warfare) Committee performed similar functions with regard to trench warfare stores. The Chemical Advisory Committee considered designs for chemical supplies, and the Anti-Aircraft Equipment Committee considered all questions relating to the design of sights, rangefinders and similar equipment.[4] In addition to these committees, the Superintendent of Research, Woolwich, and the Superintendent of Experiments, Shoeburyness, conducted research and experimental work and carried out trials.

On the establishment of the Munitions Council in August, 1917, Major-General the Hon. F. R. Bingham, who had succeeded General Du Cane as Director-General of Munitions Design in September, 1916, became Member of Council for Design. The group for which he was responsible included the following departments :—

Design Department.—Controller, Brig.-General A. C. Currie, C.M.G.

Trench Warfare Research Department.—Controller, Brig.-General L. C. Jackson, C.B., C.M.G.

Inspection Department.—Controller, Mr. A. H. Collinson.

Inventions Department.—Controller, Colonel H. E. F. Goold Adams, C.B., C.M.G.

---

[1] The Trench Warfare Research Department was responsible for the administration of the experimental grounds at Porton, Wembley, and Clapham.

[2] See Appendix III.

[3] *i.e.*, mechanical transport vehicles, tanks, aircraft supplies. See below, pp. 143–5.

[4] The Tank Design Committee and the Aircraft Design Committee were attached to the Mechanical Warfare and Aircraft Production Departments respectively.

In October, 1917, the organisation of the Design Department was revised, and a distinction was again made between the treatment of trench warfare or novel stores and artillery stores. During this month, the work being done at the War Office in connection with anti-gas was transferred to the Ministry of Munitions, the Trench Warfare Research Department was abolished, and an independent Chemical Warfare Department was formed to deal with all questions of design and research relating to gas and anti-gas supplies.[1] The Chemical Advisory Committee was reconstituted as the Chemical Warfare Committee and transferred to the new department, whose Controller became the design authority for these stores. The remaining functions of the Trench Warfare Research Department and of the Trench Warfare Committee[2] were embodied in a new Trench Warfare (Design) Department, which was brought into close contact with the Trench Warfare Supply Department in whose offices it was housed. These departments, although part of the Design Group,[3] were independent of the Design Department.

Chemical Warfare Department.

The Chemical Warfare Department under Major-General H. F. Thuillier, C.B., C.M.G., was divided into sections dealing with special shell fillings, lights, signals and smoke, electrical and mechanical appliances, and anti-gas supplies. The Chemical Warfare Committee was an amalgamation of the Chemical Advisory Committee and the War Office Anti-Gas Committee, together with representatives of the Trench Warfare Supply and Explosives Supply Departments. The heads of the different sections acted as *ex-officio* members assisted by a panel of experts or associate members.

In October, 1918, when General Thuillier returned to active service, an attempt was made to secure closer co-operation between the Chemical Warfare Department and the Army-in-the-field in regard to the development and modification of chemical stores. Brigadier-General C. H. Foulkes, Director of Gas Services in France, was appointed President of the Chemical Warfare Research Committee[4] on 22 November, 1918, and it was arranged for the new Controller, Lieut.-Colonel H. Hartley, who was recalled from France, to act as Vice-President.[5] The effects of this scheme were not demonstrated owing to the cessation of hostilities.

---

[1] M.C. 285.

[2] This Committee was formed in February, 1917, and combined the functions exercised by the Ordnance Committee and the Munitions Design (Trench Warfare) Committee relating to trench warfare stores.

[3] The Chemical Warfare Department was transferred to Group X in April, 1918, and the Trench Warfare Department eventually became part of Group W. See Appendix V.

[4] It was originally suggested that a Chemical Warfare Board for research should be formed similar to the Tank Board, but without responsibility for supply questions. This was not done and the functions of the Chemical Warfare Research Committee were exactly the same as those of the Chemical Warfare Committee.

[5] Estab. Cent./1/267.

Trench Warfare (Design) Department.

The Trench Warfare (Design), or Trench Warfare Department as it was generally known, was under the control of Major-General G. T. M. Bridges, C.M.G., D.S.O., who was succeeded in July, 1918, by Brigadier-General A. M. Asquith, D.S.O. It was responsible for the approval of designs and the experimental work in connection with aircraft bombs, armour, grenades, flares, trench mortars and projectors and their ammunition and miscellaneous supplies or trench furniture. The heads of sections together formed a committee to consider proposed designs.[1]

In June, 1918, a supply section was attached to the department by the transfer of the outside engineers, who were chiefly engaged in the development of aerial ropeways, from the Trench Warfare Supply Department. Authority was granted by the Minister to place contracts direct, in order to ensure complete control over the supply of experimental stores.[2]

In August of the same year, a special sub-committee was formed to consider and advise upon possible improvements to existing service stores used in trench warfare and to devise new stores to meet requirements or anticipated requirements in the field.[2] This was a wide mandate, but up to the time of the department's dissolution the only investigations undertaken by the sub-committee related to body armour, small arms ammunition boxes, and barbed wire.[3]

(*b*) INVENTIONS DEPARTMENT.

The Inventions Department was established with Mr. (later Sir Ernest) Moir as Controller, on 6 August, 1915, to deal with the large number of proposals which were received by the Ministry of Munitions from outside inventors. This was part of a general scheme for co-ordinating research and experimental work, which had already resulted in the formation of the Naval Inventions Board, and it was thought that the new branch would deal with all inventions relating to munitions. The War Office Inventions Branch was not transferred, however, and for several months the responsibility for accepting or rejecting inventions remained with the War Office, and the functions of the new branch were extremely limited. This difficulty was removed on 29 November, 1915, when the responsibility for design and invention was transferred to the Ministry of Munitions and the War Office Inventions Branch was amalgamated with Mr. Moir's department. As a result of this amalgamation, the Inventions Department became responsible for accepting, testing and developing inventions relating not only to stores supplied by the Ministry of Munitions, but to all War Office stores. It was afterwards estimated that three-quarters of the work of the branch lay outside the sphere of the approval of the Design Department.

---

[1] Estab. Cent./53/47.
[2] HIST. REC./H/1600/14.
[3] For further details on Design, see Vol. IX, Part II.

The machinery of the department consisted of an Honorary Advisory Panel of technical, military and naval experts, by committees of which all proposals of inventions were reviewed, and an office staff for executive action.

As inventions were received into the department they were examined by technical examiners, sifted and submitted to the appropriate committee for consideration, or to the Experimental Section for testing and experimental purposes.[1] The department had under its control experimental grounds at Imber Court, Claremont and Chattenden, and was authorised to allocate certain sums of money for the preparation of models and the further development of invention.

As the research work of the different committees increased, small sections were formed corresponding to the more important committees, such as the Chemical Research Section dealing with experimental work on the fixation of atmospheric nitrogen, the Anti-Aircraft Experimental Section, and the Chemical Waste Products Branch. Sections were also formed to deal with artificial limbs and patents and royalties, the responsibility for the latter being transferred to the Inventions Department early in 1916.[2]

At the time of the formation of the Munitions Council, the Inventions Department became part of Group D, together with the Inspection and Design Departments, but when the Warfare Group was formed in June, 1918, it was transferred to the new group, where it remained until its dissolution.

(*c*) Inspection Department.

At the time of the establishment of the Ministry, the Chief Inspector, Woolwich, was responsible to the Director of Artillery at the War Office, but his staff included naval men and undertook the inspection of practically all guns, mines and torpedo explosives for the Navy, and such of the Navy's ammunition as was made at Woolwich, as well as of all the requirements of the Army. Actual firing proof of guns, carriages and cordite was carried out under the Superintendent of Research, and the firing of projectiles by the Superintendent of Experiments, but in each case the responsibility for the nature and correctness of the proof lay with the Chief Inspector, Woolwich.

When responsibility for the inspection of stores which it supplied was transferred to the Ministry on 5 July, 1915, the position of the Chief Inspector, apart from the fact that he now took orders from the Director-General of Munitions Supply instead of from the Director of Artillery, remained for the time being unchanged and an officer from his department, Captain Vaux, was attached to the staff of the Director-General of Munitions Supply for the purpose of co-ordination. It was agreed that no relaxation either of specification or of tests, including proof, should take place without the concurrence of the War Office for

[1] The Experimental Section did not undertake research work.
[2] General Memorandum, No. 121.

land service stores or of the Admiralty for naval stores, and that the Ministry, " while not precluded from dispensing with the services of any particular officer whom it does not need, shall not make any fresh appointment of Inspectors without, in each case, the concurrence of the War Office."[1]

During the summer and autumn of 1915, however, the Inspection Department at Woolwich became quite inadequate to deal with the increased supply of munitions. Sub-departments were erected in provincial centres to deal with the new output, and, owing to the shortage of technical experts, it became necessary to separate administrative and technical functions in order to set free the technical experts for technical work.

On the formation of the Munitions Design Department in December, 1915, an Inspection Branch was formed at Headquarters within the Design Department, under Brig.-General F. F. Minchin, as Deputy Director-General (I). General Minchin had himself before the war been Chief Inspector, Woolwich, and the Chief Inspector, Woolwich, Colonel J. Stansfeld, and the Chief Inspector of Small Arms, Enfield, Colonel G. H. S. Browne, were under his direction.

In addition to its primary duty of inspection with a view to certifying serviceability of stores, the Inspection Department acquired several other functions, partly from its close contact with manufacturers, partly from the wealth of technical knowledge accumulated as a result of its daily handling, examination, and proof of stores, and partly as the inheritor of the technical equipment of the Chief Inspector's department at Woolwich.

Thus inspection was not confined to completed munitions. As a rule it comprised also the inspection and testing of raw material, sub-components and main components. It also provided in most cases the basis of the contract or order, namely, the drawing and specification numbers. In some cases the Inspection Department's staff performed for a supply department the function of " production " or " hastening " of supply, and down to the summer of 1917 the department carried out the repair of all salved machine guns.

Secondly, on account of its technical knowledge, it continually acted as an adviser in design to the Design Department and to the Ordnance Committee. Designs and amendments to design were submitted to it before approval, and closely examined from the point of view of suitability for service. The Design Department was indeed dependent on the experts of the Inspection Department's Drawing Office at Woolwich for the correct dimensioning of its designs.

In March, 1916, the Inspection Branch was separated from the Design Department and placed under a civilian, Sir Sothern Holland, with the rank of Director-General, and by July, 1916, the department was divided for administrative purposes into four main branches, each under a Deputy Director-General.[2] D.D.G. (W), Mr. (later Sir Harry) Ross Skinner, was responsible for the administration of inspection throughout the country. D.D.G. (Y), Mr. A. E. Hadley, was responsible for the organisation, development and

[1] M.W. 1374/5.

[2] See Appendix III.

personnel of the department and the provision of laboratories and other buildings. D.D.G. (X), Colonel J. Stansfeld, dealt with all technical questions referring to methods of inspection, relaxation of tests, specifications, etc., except in the case of small arms. D.D.G. (Z), Colonel G. H. S. Browne, dealt with all matters referring to the inspection of small arms, machine guns and accessories. The survival of a Small Arms Branch was due to the historical accident of the separation of Enfield from Woolwich, but both Colonel Browne and Colonel Stansfeld, were now moved to Headquarters.

For the actual work of inspection the department was divided into sections according to the nature of the store inspected, and the section directors, stationed either at Woolwich or at one or other of the provincial centres of inspection, reported to the particular deputy director-general concerned.

The Laboratory Stores[1] Section was responsible for the inspection of shells, components and gauges. The High Explosives and Propellant Sections, which had originally formed part of the Laboratory Stores Directorate, dealt with the inspection of high and propulsive explosives, and included a small military I.O.O. (Inspecting Ordnance Officers) branch, which was responsible for methods of storage and the production of stores in service condition. The Carriages, Small Arms, Small Arms Ammunition, Guns and Grenades, and Rangefinders and Optical Munitions Sections dealt with the stores indicated by their titles. The Equipment Branch was responsible for recording and circulating modifications and new designs, for the sealing of drawings and the preparation of handbooks. The Chemical Section, which was the successor of the War Department's Chemist, was strengthened, and became responsible for all kinds of experimental work and the investigation of questions such as the causes of deterioration, the value of inventions, etc.

In August, 1916, a Mechanical Transport Section was formed to deal with the inspection of mechanical transport vehicles, responsibility for the supply of which had recently been transferred to the Ministry of Munitions.[2] In this case, the Inspection Department exercised the dual function of speeding up output as well as carrying out inspection.[3]

The scope of the department was considerably increased in February, 1917, when the Inspection Branches in Canada and the United States of America became part of the headquarters organisation. Hitherto these branches had formed part of the supply organisations under the Imperial Munitions Board and Mr. E. W. Moir respectively, although it had been understood that the inspector in charge might refer direct to the Ministry on certain technical questions. These two branches now came under the direct control of the Director-General of Inspection, Colonel W. E. Edwards, R.A., being appointed Director in Canada, and Colonel L. R. Kenyon, R.A., Director in the United States of America.[4]

---

[1] Early in 1916 the Laboratory Stores Section was divided into three branches —Gun Ammunition (Technical), Gun Ammunition (Supervisory), and Munitions Areas. For details see Vol. IX, Part II.

[2] See below, p. 142.

[3] General Office Notice, No. 58.

[4] General Office Notice, No. 98.

In the autumn of 1917 a special section was formed to deal with the inspection of trench warfare stores, and in September of the same year the department became responsible for the inspection of steel.

The authority of the Inspection Department did not, however, cover all the stores supplied by the Ministry of Munitions. The Mechanical Warfare and Aircraft Production Departments had their own inspection sections, which were in no way responsible to the Director-General of Inspection and differed in their methods of organisation.[1]

VI. Supply Departments.

(*a*) General Development.

The supply departments of the Ministry of Munitions originally consisted of the three practically self-contained units representing the different supply services transferred from the War Office. The Munitions Supply Department, primarily responsible for artillery stores, was the successor with increased functions of Mr. Booth's department.[2] The Explosives Supply Department continued the work done by Lord Moulton's Committee and A.6. The Trench Warfare Supply Department was responsible for the functions hitherto performed by F.W. 3A.

These departments were separated from each other and from the Secretariat by physical conditions, being housed in Whitehall Place, at Storey's Gate, and in King Charles Street. Their relations with other sections of the Ministry were ill defined. They each possessed establishment and contracts or finance sections of their own and soon developed independent organisations for dealing with questions of storage and transport. Unlike the Secretariat, they included few civil servants amongst their officers, and the more important posts were held by business men, engineers, chemists, and lawyers.

The Explosives and Trench Warfare Supply Departments already possessed a form of organisation and certain definite functions. Thus their subsequent development was the result of an increased volume of work and of the attempt to assimilate their organisation to that of the rest of the Ministry. The organisation of the Munitions Supply Department, on the other hand, was still inchoate. As new responsibilities were undertaken by the Ministry, so the number of its branches increased, until the middle of 1916, when a process of disintegration began and the Director-General of Munitions Supply was gradually replaced by a number of independent heads of departments. After this date, the practice of forming new sections in an already overburdened department was abandoned and independent departments were formed to deal with Agricultural Machinery, Aircraft Supplies, Scrap Metals,[3] Engineering Efficiency,[4] etc.

---

[1] See below, p. 144. [2] See Appendix I.

[3] The Scrap Metals Department was formed in February, 1917, under Mr. Alexander Walker as Director to deal with the collection and utilisation of scrap metals required by the Ministry.

[4] The Engineering or Engineering Efficiency Department was formed in March, 1918, to co-ordinate the activities of local officers attached to the supply departments and to secure the maximum efficiency amongst the firms in each area. The activities of the department were confined to ordnance production (*i.e.*, to the outside staff of the departments in Group O), but eventually the inspectors of the Machine Tool Department were included. For further details see Vol. VIII, Part IV.

This process of division into smaller units was carried still further under the Munitions Council, when each section dealing with a particular problem became directly responsible to a Member of Council. For example, the Gauges and Machine Tool Branches became independent and the American and Transport Department was broken up into its component parts—Inland Transport, Optical Munitions, Railway Materials, etc. The different departments were then grouped together according to a common purpose and the Munitions Council, through its individual members, committees and secretariat, co-ordinated the relations of branches and groups.[1]

According to the earliest arrangement (September, 1917), the supply departments formed five groups :—

Group S was composed of the Iron and Steel Production and Factory Construction Departments.

Group M comprised all the other departments dealing with materials and transport, including the Railway Materials, Optical Munitions and Potash Production Branches.[2]

Group X consisted of the Explosives Supply and Mineral Oil Production Departments.

Group P covered the departments dealing with the supply of ammunition of all types, including the Area Organisation, Gauges and Timber Supplies Departments[3] and the Central Clearing House.[4]

Group G included the departments responsible for the supply of guns, trench mortars, machine guns and small arms.

Group E covered those supplies for which engines were essential, including the Electrical Power Supply and Machine Tool Departments.

The position of the Trench Warfare Supply Department under this new system was peculiar. Its functions remained practically unaltered, but the Controller was responsible to different Members of Council for different aspects of his work. He reported to Council Member X in connection with chemical supplies, to P on trench mortar ammunition and miscellaneous stores, and to G on trench mortars. This was the result of the general scheme to revise the functions of the departments on a more logical basis, and finally led to the disappearance of the Trench Warfare Supply Department.

---

[1] See below, Chapter VI.

[2] The Potash Production Branch was formed in June, 1917, as part of the Optical Munitions Branch to deal with the importation, production and distribution of all compounds containing potassium.

[3] The Timber Supplies Department was originally a section in the Gun Ammunition Filling Department responsible for the supply of ammunition boxes and packing cases.

[4] The Central Clearing House was established in October, 1916, to collect information with regard to the distribution and use of existing machinery and to assist the supply departments in securing its most productive utilisation. The department worked through the existing organisations in the areas and its own local officers, and it was eventually incorporated in the Engineering Department.

The original system of grouping was modified on several occasions. At the resignation of Sir Glynn West in January, 1918, Groups G and P were amalgamated to form Group O. In the beginning of the same year a separate Air Group was formed of the departments dealing with aircraft supplies, and in June, 1918, Group E was replaced by Group W. The final organisation under the Munitions Council is shown in detail in Appendix V.

(*b*) Explosives Supply Department.

The Explosives Supply Department dated from January, 1915, when a branch (A.6) was formed in the Master-General of Ordnance's department to assist Lord Moulton's Committee in dealing with the supply of high explosives and of materials for all classes of explosives for the Navy and the Army.[1] This branch was responsible for the supervision of all contracts for high explosives and their ingredients, the organisation of State manufacture through national factories, storeholding, accounting, and transit arrangements relating to these supplies, and for certifying bills before passing them to the Finance Branch for payment.

The Explosives Supply Department was transferred to the Ministry of Munitions on 23 June, 1915, after six months' experience as a semi-detached emergency war department. It continued to occupy its existing quarters at Storey's Gate, and preserved to a larger extent than any other section of the Ministry its previous organisation. Lord Moulton, formerly Chairman of the Committee on High Explosives, was appointed Director-General with Mr. (later Sir Sothern) Holland as his deputy, and Brig.-General W. Clare Savile, D.S.O., as his Military Adviser, and in July, 1915, the department consisted of six branches dealing with raw materials, propellant supplies for land service,[2] high explosives, factory construction, establishment questions and finance.[3]

In the course of time, separate sections were formed to deal with gas works products, acid supplies, ammonia liquor production, safety conditions in factories and storage, and in April, 1918, the Chemical Supplies Branch was transferred from the Trench Warfare Supply Department, but the Explosives Supply Department retained the character which it brought with it from the War Office. It was to a high degree self-contained. The contracts for high explosives were negotiated by the supply officers themselves, and the accounting and finance work was done in close association with them,[4] even after the Finance Section became part of the Finance Department.[5] The department had its own Factory Branch independent of the Factory Construction Department under Mr. (later Sir John) Hunter. It controlled its own railway transport by special arrangement

[1] For details see Vol. X., Part IV.

[2] Up to the date of transfer to the Ministry of Munitions propellant supplies had been dealt with by another section at the War Office (A.7).

[3] See Appendix II. [4] Hist. Rec./R/263/20. [5] See above, p. 121.

with the Inland Transport Department of the Ministry, purchased coal for its factories through its own coal section, and bought its own railway material independently of the Railway Materials Department. In labour matters, the department frequently acted independently of the Labour Department, having its own Labour and Housing Sections.

When the Munitions Council was established in August, 1917, the Explosives Supply Department formed part of a separate group under Sir Keith Price as member of Council X, who had previously acted as Deputy Director-General under Lord Moulton. Major A. Corbett became Controller of the department, whilst Lord Moulton continued to act in a supervisory capacity. The group also contained the Mineral Oil Production Department, which under the name of the Petroleum Supplies Branch had been established as part of the Munitions Supply Department in January, 1917, to deal with the importation, home production and distribution of petroleum and similar mineral oils.

(*c*) Trench Warfare Supply Department.

Before the formation of the Ministry of Munitions the responsibility for supplying the armies with novel trench warfare stores (apart from trench mortars and their ammunition) and with chemical supplies rested with a subsection of the Department of Fortification and Works (F.W.3.A), under Colonel Jackson. This branch was transferred to the Ministry of Munitions on 23 June, 1915, but the Trench Warfare Supply, or Engineer Munitions Department as it was first called, differed from other departments of the Ministry in several respects. Contrary to the general policy of the Army Council, the responsibility for design was transferred in addition to the supply functions, and the department dealt with questions of research, experiment and proof. Secondly, it was so organised internally that each section was responsible for the supply of components and for all processes connected with the production of a completed munition. Thus one section dealt with grenades, whether explosive or chemical; another with trench mortars and their ammunition, including fuses and all other components; another with Stokes guns and their ammunition; another with salvus apparatus and sprayers; another with bomb throwers and flares. Some common-service sections existed, but the extent of their use depended on the choice of the supply section directors. An Outside Engineering Branch, under Captain J. A. Leeming, developed into a general organisation with representatives throughout the country, whose duties resembled those of the area engineers, with whom a certain degree of co-ordination was gradually attained. For a time the Grenade Section also had its own local representatives at filling factories. There was a section to deal with the handling of explosives, but its activities were limited at first to matters relating to trench mortar ammunition. Similarly, the work of the Filling Station Construction Section was confined to the erection of bomb-filling factories. The department also exercised exceptional functions with

regard to store-keeping and store issuing,[1] but this special arrangement came to an end in the spring of 1918.

The history of the Trench Warfare Supply Department is, generally speaking, the history of the gradual assimilation of this exceptional organisation to that existing in other departments of the Ministry. This evolution was parallel with, and in part consequent upon, the gradual standardisation of trench warfare stores. On 13 July, 1915, it was arranged that contracts should be submitted to the Contracts Department for approval, and on 21 December an Assistant Director was appointed in the Finance Department to deal with trench warfare contracts involving capital expenditure and to sanction all orders prior to any financial commitments of the Ministry.

On 28 July, 1915, the beginning of a separation between research and supply functions was made, and it was agreed that Mr. (later Sir Alexander) Roger, who had been appointed "Financial Adviser" to General Jackson, should be responsible for supply when the production stage was reached. This division of functions was carried further on 20 December, when a separate Trench Warfare Research Department was formed under General Jackson to deal with questions of design and experiment, and Mr. Roger became Director-General of Trench Warfare Supply. The alteration weakened the liaison between the supply and design officers dealing with novel stores, but the defect was partially eliminated in October, 1917, when the newly formed Trench Warfare (Design) Department[2] was housed at King Charles Street, and closer co-operation between the design and supply authorities was established.

The chief feature of the history of the Trench Warfare Supply Department after its separation from the Trench Warfare Research Department in December, 1915, was the reorganisation of the sections by Mr. E. V. Haigh, who was appointed Deputy Director-General in September, 1916. The original system by which each section worked independently for the production of a complete munition was gradually replaced by an organisation resembling more closely that of the Munitions Supply Department.

On the establishment of the Munitions Council in August, 1917, the Trench Warfare Supply Department, whilst remaining as a whole under the direction of Sir Alexander Roger (succeeded by Mr. Haigh in October, 1917), was divided as regards responsibility under different Members of Council. Thus Trench Warfare Chemical Supplies was placed in Group X (Explosives), Trench Warfare Ammunition in Group P (Projectiles), and Trench Warfare Mortars in Group G (Guns). In April, 1918, the department was finally

[1] *i.e.*, by special arrangement with the Quartermaster-General the department issued stores direct to the army in the field, instead of transferring them to the Army Ordnance Department upon completion.

[2] See above, p. 130.

disintegrated.[1] The Gas and Chemical Supplies Section was made part of the Explosives Supply Department, and the sections dealing with the construction and control of filling stations were made part of the Gun Ammunition Filling Department. The responsibility for the supply of mortars passed to the Gun Manufacture Department, and for the supply of grenades, bombs (including aerial bombs) and miscellaneous trench appliances such as steel helmets to the Gun Ammunition Department.

These changes were made in recognition of the fact that most trench warfare stores had in fact become standardised munitions, or as nearly standardised as any munitions can be under conditions of modern warfare. In the case of certain stores that were still in the experimental stage, such as the telpher railway, special arrangements were made, and in June, 1918, a supply section was formed to deal with such questions in the Trench Warfare (Design) Department, composed of members of the Outside Engineering Branch whose general functions had been absorbed in the Engineering Department.[2]

(*d*) Munitions Supply Department.

(i) *Formation and Development, June,* 1915—*July,* 1916.

The nucleus of the Munitions Supply Department was the staff at the War Office under Sir Percy Girouard and Mr. Booth,[3] to which were added sections dealing with Contracts, Finance and Inspections as their transfer from the War Office was effected. Sir Percy Girouard was appointed Director-General at the beginning of June, but the organisation of the department was under discussion for some time. At first there seems to have been some question whether the department should be divided into branches the heads of which should be directly responsible to the Director-General, or whether two Assistant Secretaries should be appointed with general responsibility for the business and commercial control of the department, and also whether technical experts or business men should be appointed to fill the higher posts.[4] The first scheme of organisation was drawn up on the basis of two Assistant Secretaries, but this was remodelled on 21 June and the principle was adopted of organising the department in three main divisions, allocating one division to each of three Deputy Directors-General. These posts were filled by Mr. Booth, by Mr. (later Sir Eric) Geddes, Deputy General Manager of the North-Eastern Railway Company, and by Mr. (later Sir Glynn) West, a Managing Director of Messrs. Armstrong, Whitworth & Co., who since April had been acting as technical adviser to the Armaments Output Committee.

---

[1] As early as November, 1915, it had been proposed that the functions of the Trench Warfare Supply Department should be distributed, the design functions returning to the War Office and the research work passing to the Inventions Department, the responsibility for the supply of components and explosives being divided amongst the appropriate sections of the Munitions and Explosives Supply Departments. This would have left a section dealing with the supply of gas, flares and other miscellaneous stores which it was proposed might also form part of the Munitions Supply Department. C.R.2931.

[2] See above, footnote, p. 134. [3] See above, p. 108. [4] Hist. Rec./R/263.3/12.

By 1 July the functions of the department were allocated as follows: Mr. G. H. West, D.D.G. (A).—Supply of gun ammunition, machinery and metals. Mr. G. M. Booth, D.D.G. (B).—Area organisation, statistics, intelligence and record, foreign orders. Mr. E. C. Geddes, D.D.G. (C).—Supply of machine guns, rifles, small arms ammunition, guns and optical munitions, horse-drawn transport vehicles.

In addition to these principal divisions, there were also three smaller branches dealing with contracts, finance, and establishment questions.[1]

During the next six months the functions of the Munitions Supply Department increased considerably and various common service sections were formed to supplement the work of the supply branches. A small section was formed under Captain Vaux to deal with the work arising from the transfer of inspection to the Ministry. At the beginning of July a fourth Deputy Director-General (D), Mr. (later Sir Charles) Ellis, Managing Director of Messrs. John Brown & Co., was appointed to take charge of the supply of guns and equipment which had hitherto formed part of D.D.G. (C)'s functions. On 3 August Sir Percy Girouard was succeeded by Sir Frederick Black, C.B., as Director-General, and on 23 August the administration of the Royal Ordnance Factories was transferred to the Ministry of Munitions and placed under D.D.G. (C). A Priority Branch was formed in D.D.G. (B)'s division to deal with questions of relative urgency,[2] and in the same month the Area Organisation Branch under Mr. (later Sir James) Stevenson, which was responsible for the general administration at headquarters of National Shell Factories, Area Offices, and contracts placed through Boards of Management, began to report direct to the Director-General.[3]

In September, 1915, a Salvage Branch was formed in D.D.G. (C)'s division, and in the same month a Forwarding and Delivery Branch[4] was established to deal with all questions of railway transport. In October, Mr. S. H. Lever, who had been appointed Financial Adviser to the Director-General of Munitions Supply in August, 1915,[5] became Assistant Financial Secretary in charge of an independent Finance Department, of which the Munitions Supply Finance Section became a part. In the same month a Factory Construction Branch was formed, under Mr. John Hunter, to supervise the erection of national factories, steel works, etc.

In January, 1916, the Munitions Supply Department was reorganised with the object of securing a better administration of gun ammunition filling. Under the existing arrangement, Colonel Strange

---

[1] See Appendix II. [2] See above, p. 114.

[3] For details of Area Organisation and of the work of the department see Vol. II, Part II.

[4] The name of this branch was subsequently changed to Railway and later Inland Transport Department.

[5] See above, p. 121.

in D.D.G. (A)'s division was responsible for the erection and administration of the new filling factories, whilst the administration of the Royal Ordnance Factories, Woolwich, hitherto the centre of filling operations, was under D.D.G. (C). By the new arrangement A.M.4, Colonel Strange's section, was transferred to D.D.G. (C)'s division, which became in fact the Gun Ammunition Filling Department, as the branches dealing with small arms, small arms ammunition and salvage were grouped into another division under Mr. (later Sir Arthur) Duckham as Deputy Director-General (E). Similarly, the sections responsible for optical munitions, railway transport and special munitions became a separate branch, known as C.M. (W), under Lieut.-Colonel R. L. Wedgwood. The administration of Woolwich remained with D.D.G. (C), but the control of the Royal Small Arms Factory, Enfield, became part of D.D.G. (E)'s responsibilities and the administration of Waltham Abbey passed to the Explosives Supply Department.

(ii) *Disintegration, July,* 1916—*July,* 1917.

By 1 July, 1916, the Munitions Supply Department had reached its maximum development as a single administrative unit under a Director-General and the process of disintegration was about to commence. At this date there were five divisions under Deputy Directors-General dealing with Shell Manufacture, Foreign Orders (including Priority), Gun Ammunition Filling, Guns, Small Arms and Small Arms Ammunition, and five smaller branches responsible for Contracts, Area Organisation, Optical Munitions (including Railway Transport), Overseas Transport and Mechanical Transport.[1] The Overseas Transport Branch, originally a small Shipping Section in D.D.G. (B)'s division, had been formed in February, 1916, to arrange for the transport from abroad of munitions and materials. The Mechanical Transport Section had been in existence since May with responsibility for the supply of tractors for heavy guns, and, in the same month, a Railway Materials Branch had been established in D.D.G. (D)'s division to develop the manufacturing resources of the country in this respect and to secure economy of materials. The staff numbered 1,532 as compared with 224 in July, 1915, and some of the branches under the Deputy Directors-General were of considerable size and importance. The Production Branch (A.M.3) of the Shell Manufacture Division had recently been divided into four sections responsible for (*a*) trade production ; (*b*) production by National Shell and Projectile Factories ; (*c*) output progress returns, statistics, etc. ; (*d*) gauges, and the Raw Materials Branch (A.M.2) consisted of eleven sections. It had become impossible for the Director-General to represent all the branches for which he was nominally responsible, and soon after Mr. Montagu became Minister of Munitions the more important branches ceased to be part of the Munitions Supply Department.

The Shell Manufacture Department was the first to become independent. On 13 August, 1916, Mr. West began to report direct to the Minister, and a month later he was formally designated

[1] See Appendix III.

Controller of Shell Manufacture.[1] Mr. (later Sir Leonard) Llewelyn and Mr. (later Sir Alfred) Herbert, the heads of the Raw Materials and Machine Tool Branches, became Deputy Directors-General under Sir Frederick Black, and a Director of Steel Production, Mr. John Hunter, was appointed to undertake the work hitherto performed by a section of the Raw Materials Branch.

On 2 September the responsibility for the supply of mechanical transport vehicles was transferred to the Ministry, and instead of placing this work with the Mechanical Transport Section which already existed in the Munitions Supply Department, a Mechanical Transport Department was formed under Sir Albert Stanley, and the existing branch was absorbed in the new organisation.[2] This was the first new supply department to be constituted independent of the Munitions Supply Department.

The change was completed at the beginning of October, when the appointment of the Advisory Committee was announced and the independent departments of Ordnance Supply and American and Transport were formed. The Ordnance Supply Department, under Mr. Ellis as Director-General, included the following branches :—

(1) Gun Ammunition Filling, under Lieut.-Colonel L. C. P. Milman, R.A.
(2) Guns and Carriages, under Lieut.-Colonel Symon.
(3) Machine Guns, Small Arms and Small Arms Ammunition, under Mr. Alexander Duckham.
(4) Salvage, under Captain A. U. Greer.
(5) Royal Ordnance Factories, Woolwich, under Mr. (later Sir Vincent) Raven.

The American and Transport Department, under Mr. (later Sir Ernest) Moir, consisted of the following branches :—

(1) Railway Materials, under Mr. E. J. Allen.
(2) Overseas Transport, under Mr. (later Sir Robert) Burton Chadwick, M.P.
(3) Railway (later Inland) Transport, under Mr. Howard Williams.[3]
(4) Optical Munitions and Glassware, under Mr. A. S. Esslemont and Mr. F. Cheshire.
(5) American Branch, under Mr. (later Sir Henry) Japp.[4]

As a result of this reorganisation, the Munitions Supply Department was reduced to seven branches dealing with Contracts, Area Organisation, Foreign Orders (including Priority), Non-Ferrous Materials, Iron and Steel Production, Factory Construction, and Machine Tools, none of which were, strictly speaking, occupied with munitions supply.

---

[1] Early in 1917 Sir Glynn West became responsible for additional gun repair, and in May he was appointed Controller of Shell and Gun Manufacture.

[2] General Office Notice, No. 41.

[3] A Port Forwarding Branch, under Mr. W. T. Potts as Director, was also formed in April, 1917, to arrange for the handling of all goods at ports. General Memorandum, No. 1.

[4] This was the organisation in New York which Mr. Moir had established earlier in the year, and a small section at headquarters.

In January, 1917, a Petroleum Supplies Branch was added, under Mr. E. Houghton Fry as Director, to develop the production of petroleum and other mineral oils. This branch became practically independent in the following July, when it was reconstituted as the Mineral Oil Production Branch and eventually became part of the Explosives Supply Department. In February the Priority Branch became independent under Mr. (later Sir Edgar) Jones, M.P., and on 28 March Mr. Mann became Controller of an independent Contracts Department. On 20 March a Mineral Resources Development Branch was formed, under Sir Lionel Phillips, Bt., as Controller, to examine and develop mineral properties in the United Kingdom. Finally, in April, a Central Stores Branch was set up, under Major the Hon. L. H. Cripps (Deputy Director-General), to deal with all questions of storage, excluding the Explosives and Trench Warfare Supply Departments, and storage sections were transferred from the Inspection, Gun Ammunition Filling and other departments to this new branch.

Meanwhile, on 12 March, 1917, it had been announced that in consequence of Sir Frederick Black's temporary absence in India, Mr. Llewelyn, Mr. Herbert and Mr. Hunter would report direct to the Parliamentary Secretary, and Mr. Booth would report to Mr. Moir, who would act as Chairman of the Russian Supplies Committee. This may be taken as marking the real end of the Munitions Supply Department as a unit of administration. Henceforth it existed in name only, the new branches reporting either direct to a Parliamentary Secretary or, as in the case of Central Stores, to a Board. Sir Frederick Black did not return from India until June, when the reorganisation of the Ministry was under consideration, and the last traces of the Munitions Supply Department disappeared with the formation of the Munitions Council.

(*e*) Engine and Aircraft Departments.

During the five months beginning September, 1916, the undertakings of the Ministry expanded far beyond the scope of its original functions and the Minister of Munitions became the purchaser of the greater part of the petrol engine production of the country as well as of aircraft supplies for both Services.

The Mechanical Transport Supply Department, which was formed in September, 1916, under Sir Albert Stanley[1] as Director-General, was responsible for the supply of mechanical transport vehicles for the British Forces and for the Allies. This included the work already being done by a small Mechanical Transport Section in the Munitions Supply Department and by Q.M.G.3 at the War Office. In October, Colonel Sir Capel Holden, K.C.B., was transferred from the War Office with part of his staff, and until April, 1917, the work of the department was divided into two main divisions dealing with supplies for the British Forces and for the Allies. A special section was formed in the Inspection Department to deal with mechanical transport vehicles, but the responsibility for design rested with the Director-General of Mechanical Transport Supply.

[1] Succeeded by Mr. Percy Martin in February, 1917.

The Mechanical Warfare Supply Department, under Lieut. (later Lieut.-Colonel Sir Albert) Stern, was established in October, 1916, as a result of the reorganisation of the Tank Supply Committee, which had been directly responsible to the Minister for the supply of tanks since February, 1916. The department was responsible for the supply, design and inspection of tanks. It was at first organised on personal lines and, during the first year of its existence (as Tank Supply Committee or Mechanical Warfare Supply Department), there was little differentiation of functions amongst its officers. Attempts were made to bring its organisation and procedure into line with that of other departments of the Ministry but only with partial success. The Establishment, Finance and Contracts Sections became part of the main departments of the Ministry, but the Director-General of Mechanical Warfare Supply had an overriding authority on questions of finance and contracts. The Testing and Transport Section, which was manned chiefly by officers and ratings of Squadron 20, continued to arrange for transport to France in spite of War Office opposition. The inspection officers, who owed no allegiance to the Department of Munitions Inspection, reported on questions of manufacture and output progress as did the outdoor engineers of certain supply branches, and, contrary to the usual practice, it was the Design Branch which was responsible for drawings and specifications.

In February, 1917, Mr. (later Sir Percival) Perry was called in to reorganise the department on commercial lines, and thirteen sections were formed dealing with design, armour plate, testing, motor transport, etc., in addition to the outside inspection officers. In May, 1917, the responsibility for design and specifications was transferred to a War Office committee, but this arrangement proved unsatisfactory, and in October the responsibility for design again became part of the department's functions, being exercised through a committee including military representatives. At the same time, Colonel Stern was succeeded as Controller by Vice-Admiral Sir A. G. H. W. Moore, K.C.B., C.V.O.

On 1 November, 1917, a new *Mechanical Warfare (Overseas and Allies) Department* was formed, with Colonel Stern as Commissioner, to secure co-operation between the British and U.S.A. Governments for the supply of Liberty tanks and the erection of a factory at Chateauroux.

The Aircraft Production Department (at first known as the Aeronautical Supplies Department) was established in January, 1917, when the responsibility for the supply and inspection of aircraft was transferred to the Ministry of Munitions, questions of policy, programme and design remaining with the Air Board. The sections dealing with aircraft supplies at the War Office and the Admiralty formed the nucleus of the new department, of which Mr. William Weir (later Lord Weir) became Controller. The department was divided into two main divisions—Supply and Production and Inspection—which were subdivided into sections dealing with aeroplanes, seaplanes, engines, accessories, materials, etc. The Controller became a member of the Air Board and close liaison was maintained with

the Technical Department and with the Comptroller-General of Equipment. This placed the department in a peculiarly independent position, and, although the general procedure of the Ministry was adopted and sections of the common service departments, such as Finance, were attached to it for administrative purposes, it was largely a self-contained unit housed apart at the Hotel Cecil or in Kingsway.

During 1917 the Ministry took over the supply of kite balloons and sheds, and in August a Requirements and Statistics Department was formed to secure co-operation between the different branches and with the Air Board. In January, 1918, following upon the formation of the Air Ministry, the responsibility for design was transferred to the Ministry of Munitions, and the Aircraft Production Department, which had hitherto formed part of the Engines Group under the Munitions Council, became an independent Air Group, and Sir William Weir was appointed Member of Council A and Director-General of Aircraft Production. A Technical Department was formed to deal with questions of design and experiment, and shortly afterwards an American Assembly Department was established to deal with the American machines arriving in this country, the Controller of which (Mr. Alexander Duckham) was also responsible for the National Aircraft Factories Department which had formed part of the Supply Department.

In April, 1918, Sir Arthur Duckham, K.C.B., succeeded Sir William Weir as Director-General on his appointment as Air Minister.

The Petrol Engine Department, under Mr. Percy Martin as Controller, was formed at the same time as the Aircraft Production Department—January, 1917. At this date there was a growing shortage of petrol engines, and it seemed that engine capacity could be more easily extended and allocated if all the main engine-using Supply Departments were brought within a single Ministry. Not unnaturally this responsibility passed to the department which already supplied mechanical transport vehicles and tanks and was about to deal with aircraft supplies and agricultural machinery. It was the duty of the Petrol Engine Department to collect particulars of the available resources of engine manufacture, to control output, to extend works, to receive the requirements of engine-using departments and to allocate the sources of supply to each. In February, however, it was combined with the Mechanical Transport Department, under Mr. Martin, and the powers of engine allocation and control were never employed by him, as he maintained that better results could be obtained by advising and influencing without taking any direct action.[1]

In July, 1918, when the shortage of engine supplies again became acute, a Petrol Engine Advisory Committee was established to secure the allocation of supplies by mutual arrangement.

The Agricultural Machinery Department, under Mr. S. F. Edge as Controller (succeeded by Mr. H. C. B. Underdown in October, 1917), was formed in January, 1917, in co-operation with the Board of Agriculture and the Food Controller, to develop the supply of agricultural and dairy implements and machinery.

[1] M.C. 2138.

When the Munitions Council was established in August, 1917, these departments formed part of the Engine Group, under Sir Arthur Duckham, together with the Aeronautical Supplies, Electric Power Supply[1] and Machine Tools Department. After the formation of the Air Group, and the appointment of Sir Arthur Duckham as Member of Council A, they became part of the Warfare Group, under General Seely.

VII. Field Staff.

The foregoing pages have been confined to a description of the organisation at headquarters, but no adequate idea of the Ministry's activities can be obtained without a brief reference to the outside officers who formed one of the most notable features of the Ministry's organisation. Supply, labour and common service departments had their representatives in different parts of the country, and branches of the Ministry were set up in Canada, United States of America, Paris, Berne, and Rome. In addition, the Ministry was responsible for the administration of stores, inspection bonds, factories, saw mills, drying kilns, mines and quarries, and during the last years of its existence became one of the largest employers of labour in the country.

(*a*) Administration.

Early in June, 1915, following upon the work already done under the Armaments Output Committee,[2] the United Kingdom was divided into ten administrative areas for the purpose of shell production by Co-operative Groups and National Shell Factories. These schemes were administered by local Boards of Management composed of employers acting in a voluntary capacity, under the general direction of the Area Organisation Department, but an Area Office was also established in each district to assist the Board and to act as the channel of communication with headquarters. Each office included an Area Secretary, an Area Engineer, and a Labour Officer. It was the duty of the Secretary to deal with routine work, to keep records of transactions and to act as the representative of the Area Organisation Department in all ordinary cases, and it was round his office that many of the local officers attached to other departments were grouped.[3]

Other local officers on the administrative side were chiefly concerned in this country with finance, storage and transport. The Finance Department was represented by resident accountants at national factories and stores, by travelling officers who dealt with the issue of materials, manufacturing costs and capital expenditure, and by assessors for the purpose of the Munitions Levy and the Excess Profits Duty. The Central Stores Department had more than a hundred local depôts at five important centres where stores were received and retained and whence materials and components were issued to contractors and national factories, the number of local staff employed at the time of the Armistice being 16,478. The Inland

[1] This department was originally a section in the Shell Manufacture Department.

[2] See Vol. I, Part III.

[3] For further details see Vol. II, Part II.

Transport Department was represented by Transport Officers stationed in at least eight different towns such as London, Liverpool, and Glasgow, who were assisted by travelling inspectors sent from headquarters,[1] whilst officers of the Port Forwarding Department were stationed at the more important ports to facilitate loading and disembarkation.

The Imperial Munitions Board, under the chairmanship of Sir Joseph Flavelle, which replaced the Canadian Shell Committee in November, 1915, was responsible for the organisation of munitions production in Canada. The work of the Board was divided between seven departments dealing with contracts, the administration of factories, finance, and labour problems. By March, 1917, the headquarters staff at Ottawa numbered at least 700 and there were more than 4,000 other employees stationed throughout the country.[2] The total shipments from Canada for munitions purposes were subsequently valued at $1,003,830,473·88.[3]

The organisation in the United States of America, started by Mr. D. A. Thomas (later Lord Rhondda) in 1915 and developed by Sir Ernest Moir, finally became part of the British War Mission under Lord Northcliffe, succeeded by Lord Reading. The Department of War Supplies, as it was eventually called, had offices in New York and Washington and the staff (excluding the Inspection Department) at the end of 1918 numbered at least 800.[4]

Local offices of the Ministry were established in Paris and Berne as early as September, 1915, to deal with contracts placed in France and Switzerland, and, in June, 1918, a branch was formed in Rome. By the beginning of 1918 the organisation in Paris had developed considerably. Sections had been formed representing the Optical Munitions, Inventions, Chemical Warfare, Aircraft Production, and Mechanical Warfare Departments, and these were finally co-ordinated under the Mission Anglaise de l'Armement, of which Sir Charles Ellis was appointed chairman in January, 1918.[5]

(*b*) PRODUCTION.

(i) *National Factories.*

Even before the responsibility for the Royal Ordnance Factories at Woolwich, Waltham and Enfield was transferred to the Ministry of Munitions in August, 1915, new national factories for the production of shell and explosives were being built. These were soon followed by filling factories, wood distillation factories, cartridge factories, gauge factories, steel works, drying kilns, cotton waste mills, and aircraft factories, until, in 1918, the manufacturing establishments owned by the Ministry numbered more than 250 and nearly all types of munitions were being produced by the State. The control of these establishments involved construction, management, maintenance and the provision of a variety of machinery, materials and labour.[6] A large clerical

[1] Vol. VII, Part V.
[2] HIST. REC./H/1142/2.
[3] For further details see Vol. II, Part IV.
[4] For further details see Vol. II, Part III.
[5] Vol. II, Part VII.
[6] Vol. VIII, Part I.

staff was necessary in addition to superintendents, managers, accountants, resident engineers, danger building officers and chemists, and at the time of the Armistice, the numbers employed in national factories exceeded 300,000.

(ii) *Engineering and Technical Officers.*

In addition to the technical officers in national factories, engineers and chemists were employed by the different supply departments to secure increased efficiency in contractors' works. An Area Engineer was appointed in each area to inspect the National Shell Factories, to advise on the capacity of firms, to report upon the progress of shell contracts, and to estimate the engineering capacity of the district.[1] It was originally intended that this officer should act in a general capacity for all departments of the Ministry but his activities became limited to shell manufacture and independent local officers were appointed by other departments.[2]

The Outside Engineering Branch of the Trench Warfare Supply Department had its own District Engineers or Supervisors stationed at nine of the ten Area Offices. These officers inspected works, watched the progress of contracts and assisted firms by advising as to process and expediting the supply of machinery and materials. Ordnance Engineers performed similar functions with regard to gun manufacture. The Explosives Supply Department's inspectors (expert travelling chemists) were chiefly concerned with the proper observation of safety regulations, the standardisation of processes and economy in the use of raw materials. Representatives of the Chemical Warfare Department were stationed at the works of firms manufacturing gas and anti-gas supplies. The Mechanical Warfare Department's inspectors were responsible for watching and expediting the progress of contracts in addition to their ordinary work of inspection. The Optical Munitions Department employed a few travelling inspectors. The Aircraft Production Department had both District and Works Production Officers, to investigate the sources of supply and to supervise the production of aircraft engines, components and materials. In some instances, as in the case of drying kilns, these officers actually operated the plant. The Machine Tool Inspectors assisted firms to obtain machinery and plant and also watched the carrying out of the regulations with regard to imports of and dealings in machine tools.

From 1916 onwards, attempts were made to co-ordinate the activities of these local production officers, but the problem was still unsolved when the Armistice checked further development. In October, 1916, a Central Clearing House and Area Clearing Houses were formed to deal with the proper utilisation of machinery and, at the beginning of 1918, a Department of Engineering was formed at headquarters and a Chief Engineer was appointed in each area. The functions of this officer were, however, limited to questions concerning the departments of the Ordnance Group and centralisation was not achieved.[3]

---

[1] Vol. II, Part II. [2] Vol. VIII, Part IV. [3] *Ibid.*

(iii) *Inspection.*

The majority of the stores supplied by the Ministry of Munitions were inspected by the Inspection Department, carrying on the work of the Chief Inspector at Woolwich, but in the case of aircraft and tanks, the work was done by the supply departments concerned. Testing and examination was carried out at firms' works, as in the case of guns and the larger contracts for shell, aircraft, tanks and other supplies, at inspection bonds and other local centres, or at Universities and laboratories as in the case of explosives and chemicals. A large staff of inspectors, examiners, clerks and labourers was necessary and these at the time of the Armistice numbered 61,500. The inspectors of the Mechanical Warfare Department acted as production officers in addition to their inspection duties,[1] and their work was supplemented by Squadron 20 of the Royal Naval Armoured Car Division (attached to the Mechanical Warfare Department), which was responsible for the testing of completed tanks.

Representatives of the Inspection Department were appointed in France and Switzerland. Aircraft inspectors were stationed in Paris, Buffalo and Toronto, and the Inspection Branches in Canada and the United States of America in October, 1917, together accounted for a staff of more than 8,000.[2]

(*c*) EXPERIMENTAL ESTABLISHMENTS.

The more important experimental and testing grounds, for which the Ministry of Munitions was at first responsible, were the Research Department at Woolwich and the experimental ground and proof ranges at Woolwich and Shoeburyness. By November, 1918, the experimental establishments actually controlled by the Ministry exceeded a dozen and a large number of laboratories, hospitals and other institutions were being used for research purposes.[3] The Trench Warfare Supply Department had four experimental grounds at Porton, Wembley,[4] Clapham, and Richmond Park. The Aircraft Production Department did most of its experimental work at the Royal Aircraft Establishment at Farnborough. Experimental work in connection with tanks was carried out at Dollis Hill. Experimental stations attached to the Inventions Department were situated at Claremount, Imber Court, Whale Island, Rochford, Chattenden, and Gosport. Every kind of store and experiment was dealt with at these establishments, from guns and ammunition at Woolwich to anti-aircraft apparatus at Whale Island, pyrotechnics at Wembley, trench mortars at Porton and Richmond Park, and mining and boring at Chattenden

The experimental work done for the Ministry of Munitions in laboratories and scientific institutions throughout the country was of the greatest variety. There was an Anti-Gas Department at University College and an Aircraft Inspection Department at Gower Street.

---

[1] See above p. 144.

[2] For further details see Vol. IX, Part II.

[3] For complete list see Vol. IX, Part II.

[4] Porton and Wembley were subsequently transferred to the Chemical Warfare Department.

Experimental work in optical glass was carried out at the Institute of Chemistry, King's College, and the Imperial College of Science. Research on T.N.T. poisoning was done at Guy's Hospital, Sheffield and Birmingham Universities made investigations with regard to cupro-nickel, and the British Engineering Standards Association dealt with problems concerning internal combustion engines.

(*d*) LABOUR.

The outside officers of the Labour Department were concerned with three main problems—labour supply, regulation and welfare. As early as July, 1915, labour officers were appointed in each area[1] to report on labour conditions in the district, to investigate applications for releases, badges and labour and generally to act as intelligence officers for the headquarters organisation. In November, 1915, these duties were divided. Dilution officers, later known as Munition Area Dilution Officers (generally trained engineers), were employed by the Labour Supply Department to promote the use of unskilled labour and to deal with all the problems connected with labour supply, whilst Investigation officers were appointed in eight administrative areas by the Labour Regulation Department to deal with such questions as timekeeping, wages and disputes.

The Welfare officers, who were attached to this department, were concerned with workshop conditions, the provision of canteens and transport facilities. The extra-mural officers also dealt with the general well-being of munition workers, inspecting hostels and convalescent homes and promoting recreation and educational schemes.[2]

Owing to the numbers of different departments to which the field staff of the Ministry was attached and the varied methods of payment, it has been impossible to obtain complete figures of the numbers employed at different dates. But it is interesting to notice that at the date of the Armistice when the total number employed at headquarters was 22,634, the field staff attached to different departments (excluding the branches in Canada, United States of America, Paris, Berne, and Rome) exceeded 82,000[3] and the national factories, although the staff had already been reduced in some cases, employed about 300,000.

---

[1] See above, p. 146.

[2] For further details see Vol. V, Part III.

[3] Field staff paid from headquarters, 2,510; Inspection, 61,782; Central Stores, 16,478; attached to Area Offices, 2,065.

CHAPTER VI.

THE PROBLEM OF CENTRAL CONTROL.

I. Establishment of Business Man Administration under Mr. Lloyd George.

"The main feature of the new organisation has been that we have had placed at our disposal the services of a considerable number of business men of high standing, who had been running successfully great business concerns."—Mr. Lloyd George.[1]

(*a*) The Independent Status of Heads of Departments.

The Ministry of Munitions started with a definite bias towards new and experimental forms of organisation. For the movement out of which it grew was largely a revolt against bureaucratic administration as applied to business affairs and reflected the business community's instinctive mistrust of official control in any form.

Throughout the preceding months of the war the need for utilising the services of business men in relation to war contracts had been repeatedly pressed upon the War Office and had led in that department to important developments in the desired direction. It was now intended to go further, to liberate the munitions industries from military direction, and the restrictions of established official routine, and to hand over the task of guiding and co-ordinating these developments to prominent business men familiar with industrial problems.[2] The civil servant element was not to dominate the new Department, which would be free from restrictions unsuitable to a business organisation.

The inherent antagonism between this aim and the normal practice of the public service was soon demonstrated. Sir Percy Girouard, when formulating the initial proposals for the establishment of a Central Department, emphasised the importance of such a quasi-commercial type of management. He laid it down that one of the main factors required for ultimate success was "the subordination of all other interests to the creation of an efficient control based upon business principles and a knowledge of the output of munitions of

---

[1] 20 December, 1915. *Parliamentary Debates* (1915), *H. of C.*, LXXVII, 99.

[2] "There must be real unified control—a single and central authority which will start fresh and be free from the entanglements of old official routine. For technical advice the Minister must depend on his staff, at the head of which, in a position corresponding to that of a Permanent Under Secretary, should be a man thoroughly conversant not merely with 'business'—which may mean anything or nothing—but with the business of production and the conduct of industries. . . . Under such a technical Chief of Staff should be other experts severally in charge of the main branches of supply."—("The Problem of Munitions," *The Times*, 27 May, 1915.)

war."[1] The most deadly obstacle and enemy to success in this vital undertaking would be administrative delay. As later events showed, this view took too little account of the implications of Ministerial responsibility to Parliament. It was not possible to concede completely to any business man who might be placed in charge that untrammelled freedom of decision which is the essence of business management.

The antithesis to this proposal was formulated by Sir Hubert Llewellyn Smith, to whom fell the task of moulding the new organisation on lines compatible with the observance of the fundamental principles of public administration—the co-ordination of the heterogeneous elements composing the department into a consistent hierarchy, the observance of the safeguards of Ministerial responsibility, and the like. His proposals contemplated the retention of the normal type of organisation under a permanent Secretary, who as administrative Head of the Department would be responsible to the Minister for the proper co-ordination of the work of the office and the maintenance of relations with other departments.[2]

The resultant compromise endeavoured to unite both principles. Sir Hubert Llewellyn Smith was appointed General Secretary, Sir Percy Girouard Director-General of Munitions Supply. The former was to act as chief administrative officer of the Department generally responsible for organisation; the latter was entrusted with the technical organisation of the principal new supply department. Lord Moulton, who was also given the title of Director-General, retained his independent control of the Explosives Department which he had built up during the preceding six months.

These principal officers thus enjoyed co-ordinate responsibility, and the fact that the D.G.M.S. department was housed in a separate building from that occupied by the Minister and the General Secretary gave emphasis to Sir Percy Girouard's independent authority. His department was from the outset organised as a self-contained administrative unit—an *imperium in imperio*. The instructions issued by the Director-General in June, 1915, began by defining the relations of his department to "the Ministry," *i.e.*, the Ministerial staff and Secretariat at Whitehall Gardens.[3] Further, Sir Percy Girouard was explicitly granted by Mr. Lloyd George the right of direct access to him on matters affecting his department, a privilege subsequently conferred on his successor, Sir Frederick Black, when the latter was appointed at the end of August, 1915. But, while the Director-General was not expected to report through the General Secretary, it was explicitly laid down that the latter should be kept "fully informed."

The privilege of direct access to the Minister was not only accorded to the heads of both the main supply departments—to Sir Percy Girouard as D.G.M.S., and to Lord Moulton, the Director-General of Explosive

[1] Memorandum of 31 May, 1915. Hist. Rec./R/200/7.
[2] Draft letter to Sir Percy Girouard, 31 May, 1915. Hist. Rec./R/200/36.
[3] Staff letter of 25 June, 1916. Hist. Rec./R/263.3/6.

Supply. It was further specifically conferred upon Sir Percy Girouard's four Deputy Directors-General—Mr. George Booth, Mr. Charles E. Ellis, Mr. E. C. Geddes, and Mr. G. H. West—and upon a number of the directors in the D.G.M.S. Department—Mr. G. M. Brown, Mr. F. T. Hopkinson, Mr. W. T. Layton, Mr. Leonard W. Llewelyn, Mr. E. W. Moir, and Mr. James Stevenson[1]—though the right was conditioned by the instruction that "any officers sent for by the Minister should inform their superior officers immediately and fully of what has taken place." Needless to say, the privilege in question was highly valued and was jealously guarded from encroachment in the subsequent development of the Ministry's organisation. It was, indeed, on this obstacle that most schemes of reform came to grief; and it was only under Mr. Churchill's administration that the difficulties to which it gave rise were finally overcome.

The composite character of the staff of the Ministry reflected the multiplicity of its interests and activities. Only a small minority were civil servants; the remainder were drawn in from business and professional circles and included representative men in widely different spheres. As Dr. Addison said in the House of Commons on 28 June, 1917:—

> "The Ministry presents perhaps the most remarkable aggregation of men and women of diverse qualifications and attainments that has ever been got together in this country or in the world. Men from every branch of commerce and industry are serving with us (often as volunteers); scientists, lawyers, literary men, commercial men, travellers, soldiers, sailors, and I know not what besides, are working in our ranks."[2]

(*b*) Defective Integration.

It was hardly to be expected that the new organisation should fall at once into smooth and easy working or that men of strong personality thus hurriedly assembled and given wide powers to carry out their most urgent tasks should at once achieve complete and harmonious co-operation. To secure this was a primary consideration, for, as Mr. Lloyd George wrote to Sir Percy Girouard on 14 June, 1915, "co-ordination and mutual interchange of information are absolutely essential throughout the Ministry."

Major-General Sir Ivor Philipps, the Parliamentary Military Secretary, describing the situation a few weeks after the formation of the department, attributed the existing difficulties to two circumstances:—

> "(1) The high standing of the men conducting the various departments who have been accustomed to run great businesses on their own without any interference by or collaboration with other men of their own standing.

---

[1] This list was not in practice exhaustive, and was extended as the department developed.

[2] *Parliamentary Debates* (1917), *H. of C.*, XCV, 585.

"(2) The absence of any orders clearly defining the duties of each department, the co-ordination of the duties of one department with the duties of another, and the place which each department takes in the Ministry."[1]

The chaotic condition of things implied in this description, especially the state of affairs noted under (2) above, proceeded largely from the fact that there was no single authority dealing with secretariat and establishment questions. But the prevailing sentiment was at this time antagonistic to the establishment of a strong Secretariat. Sir H. Llewellyn Smith was indeed responsible for the work of all departments of the Ministry, but his attention was primarily devoted to labour questions and the administration of the Munitions of War Act. At the time of the Minister's move to Whitehall Place in March, 1916, however, a second General Secretary, Mr. E. B. Phipps, C.B., a Principal Assistant Secretary to the Board of Education, was appointed,[2] and Secretarial and Establishment questions affecting the Supply and Design Departments were specially allocated to him. When, a few months later, Sir H. Llewellyn Smith returned to the Board of Trade, Mr. Phipps became solely responsible for the work, and a beginning was made towards the creation of a central Secretariat.

Meanwhile alleviation was sought in other directions.

Early in July, 1915, General Philipps drew up a scheme under which the responsibility for the work of the Ministry would be distributed between the Parliamentary, the Military and the General Secretaries, each of whom should undertake special responsibility for a group of departments. The Parliamentary Secretary would deal with General Establishment, Finance, Explosives, Trench Warfare, etc.; the Military Secretary with Munitions Supplies, Release from the Colours and War Office Requirements; the General Secretary with Legislation and Legal Questions, Labour Regulation, and relations with other departments. Information and reports would normally pass to the Secretaries through the heads of departments concerned, and the co-ordination of the department as a whole would be further secured by a Munitions Council, consisting of heads of departments, which was to sit daily for the transaction of business. It was to consist of the Minister, the three Secretaries, the Directors-General of Munitions Supply and of Explosives, the Director of Information and Statistics, and the Directors of Guns, Small Arms and Machine Guns, and Trench Warfare.

The subdivision of functions between the principal Secretaries was accepted in principle, and became in the course of time an established usage. Dr. Addison had from the first accepted responsibility for financial matters and also for trench warfare and inventions. Questions in which military technique was involved were to be dealt with by the Military Secretary. This arrangement was confirmed when Colonel Sir Arthur Lee succeeded General Ivor Philipps. Thus, though the office of Military Secretary lapsed when Colonel Lee left

[1] HIST.REC./R/263.3/12.

[2] 13 March, 1916. General Procedure Minute No. 1.

the Ministry of Munitions, General Philipps' tripartite division between Secretaries had substantially come into operation. The Hon. Neil Primrose, M.P., who succeeded Col. Lee in September, 1916, was specially responsible for labour and establishment questions and for the Munitions Inventions Department.[1] He was in turn succeeded in December, 1916, by Mr. F. G. Kellaway, M.P., who was also at the time primarily concerned with labour matters.[2]

No action was taken on the suggestion of a Munitions Council, and the Ministry started as four semi-independent organisations, each under a separate roof. The Secretariat and the Labour Department formed a single unit at Nos. 5 and 6, Whitehall Gardens; Munitions Supply was in Armament Buildings, Whitehall Place; Explosives Supply at the Institute of Mechanical Engineers, Storey's Gate; and Trench Warfare Supply at the Board of Education Buildings in King Charles Street.

(*c*) The Need for Centralised Supervision.

In so far as the original organisation was inspired by a desire to substitute "business management" for "official procedure," there was a tendency to give heads of departments free discretion in the organisation of their work and to avoid the imposition of prescribed methods of intercommunication. Only gradually was it realised how inevitably such a lack of co-ordination would result in overlapping of effort with its attendant evils; and that the despised "procedure" of a Government Department, and in particular the operation of an independent central registry for recording and transmitting of documents, clumsy and dilatory though its operations might appear, did in fact offer the best possible guarantee for overcoming the tendency of branches to become isolated compartments and for securing the interchange of essential information. The first-hand testimony of one of the Ministry's prominent business heads of departments is worth recording in this connection. In a retrospect of his work as Director-General of the Trench Warfare Supply Department, Sir Alexander Roger wrote as follows:—

> "When I joined the department I found that a Registry Clerk had been attached to it, a man from the Board of Education who was well acquainted with the management of a Government Registry. As in the matter of contracts, I was unacquainted with the filing methods of a Government Department, and one day asked this clerk what his duties were and suggested that he should make out a statement of what his Registry meant and what it involved. He did so, and I took his report home for a week-end and realised at once that a commercial system however good would not fit in with the systems in vogue in the other Government Departments with which we were in hourly contact. Without hesitation, therefore,

[1] General Procedure Minute No. 30, 22 September, 1916.

[2] General Office Notice No. 83, 28 December, 1916.

> cumbersome as the system appeared to me to be, I told Mr. Barber to run a Registry on the lines that he had laid down. I am glad to be able to say that the system so initiated has worked wonderfully well. It and similar systems are in some degree unwieldy, but seem better able to stand the test of time, and the Registry on Civil Service lines allows papers to be traced in and between Government offices much more easily than by the ordinary filing system."[1]

It was, however, a long time before these simple truths were generally recognised by those who were unfamiliar with Government Office procedure, and the department suffered not a little from the lack of attention and support which the Registry system received.

From another angle an approach was made towards formal inter-departmental co-operation through the inauguration by Sir Percy Girouard on 16 July, 1915, of daily conferences with his Deputy Directors-General. The usefulness of these gatherings was, however, limited by the decision prohibiting the circulation of any record of the discussions or of decisions arrived at. Heads of branches and other subordinate officers were thus completely out of touch with general developments. In any case the holding of these conferences was of short duration and lapsed on the retirement of Sir Percy Girouard at the end of July.

A further step was taken at this time, the effects of which were more durable and became of increasing importance. A weekly report compiled from contributions made by heads of departments and including a statistical summary of output was instituted, primarily for the purpose of enabling the Minister to keep in touch with the activities of the rapidly expanding departments.[2] The circulation of this document, however, not only served the purpose of keeping heads of branches better informed of developments which were of indirect concern to them, but was also utilised by successive Ministers for disciplinary purposes. Shortcomings which were revealed through the agency of the Report were discussed at Ministerial conferences, and explanation of apparent deficiencies was demanded. It was, however, some time before this procedure was fully developed.

Despite these tentative efforts the absence of effective co-ordination became steadily more obtrusive for a considerable period after the formation of the department. As an illustration, reference may be made to a memorandum[3] written on 15 October, 1915, by Mr. James

---

[1] HIST. REC./H/1600/2.

[2] As Mr. Lloyd George put it: "We have a special department whose business it is to collect and assemble every week the facts with regard to the progress made by each department, and a Weekly Report is submitted to my colleagues and myself as to the work which is going on, so that we know, if not from day to day, at any rate from week to week, where progress is made, where the work is halting, and where there are shortages which ought immediately to be made up. Then it is our business to call attention to them immediately, and see that something is done to bring every department up to the mark."—*Parliamentary Debates* (1915), *H. of C.*, LXXVII, 100.

[3] C.R. 4466.

Stevenson, in which he drew Mr. Lloyd George's attention to the difficulties which he was experiencing as Director of Area Organisation. He stated " that the spirit of co-operation, without which no business or body of men engaged in any enterprise can hope to carry it through successfully, has been conspicuous by its absence." He attributed this and other administrative deficiencies of the department to the want of a co-ordinating authority, such as would be afforded by a regularly constituted Board of executive heads. He reminded the Minister of the formula which the latter had used in the House of Commons on 23 June, 1915 :—

> " Failure often comes in these matters from the inability to allocate to the expert and the organiser their proper functions ; the organiser need not necessarily be an expert, and the expert is very rarely an organiser ; at least, the best expert is rarely the best organiser. The business of the organiser is to make the best use of the expert brain ; the organiser is the captain and the expert is the pilot."

" The desirable scheme," Mr. Stevenson concluded, " is really the usual procedure of a large industrial concern. It has its Board of Directors and it has in addition thereto its executive officers. . . . The present system and want of a directing Board has resulted in the setting up of watertight compartments, the issue of conflicting instructions, frequent change of procedure within the Ministry itself, and a tendency for each department to regard its prerogatives with jealousy. Overlapping is the child born of such entangled management."

The favour with which the idea of a " Board of Directors " was regarded had an important influence on the discussions on Central Control throughout the lifetime of the Ministry. It undoubtedly contributed both to the creation of Mr. Montagu's Advisory Committee and to the creation of Mr. Churchill's Munitions Council. The two chief experiments of Mr. Lloyd George's administration were of a different character.

Mr. Booth's emergency organisation at the War Office had been guided as regards policy by an overriding Committee known as the Munitions of War Committee appointed by the Cabinet. Mr Lloyd George, who as Chairman had supplied the driving force and ministerial authority, at first intended to appoint a new committee to assist and advise him, and hoped that it would facilitate central co-ordination and control. " We propose," he said, " to have a great Central Advisory Committee of business men to aid us to come to the right conclusions in dealing with the business community."[1]

Such an advisory body was in fact appointed and met for the first time on 23 July. It was called to consider the enlargement of the gun and shell programme ; twenty-four members attended. It never met again. It was virtually stillborn, for its *raison d'être* had vanished at the moment when the theory of a munitions movement in charge of

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII, 1190.

a Committee had given place to the project of a formally constituted Government Department. As it was, a body so composed could not have the necessary contact with the daily developments of the situation nor with the bearings of internal administrative problems. Moreover, its existence, if regularly organised with the right of reviewing specific questions, might well have aggravated the dilatoriness of official procedure and perhaps have embarrassed the freedom of Ministerial decision. Under no circumstances could it serve the purpose of improving departmental co-ordination.

On 29 December the Minister, in place of occasional gatherings of his chief officers, initiated a series of Weekly Meetings of heads of departments, which continued until the middle of February.[1] The attendance numbered about twenty, and Mr. Sutherland, one of the Minister's Private Secretaries, acted as Secretary. These meetings regularly discussed matters arising out of the Weekly Report, and matters of general policy raised by its members, such as the heavy shell programme in its various aspects ; the purchase of materials for 1917 ; the comparative costs of manufacture in various national factories ; reports prepared by heads of departments on particular questions referred to them by the Minister ; the problem of dilution ; the improvement of accommodation and the possibility (quickly vanishing) of making arrangements which would enable the whole Ministry to be brought together and housed contiguously.

These gatherings were not, however, conducted in any systematic fashion. Though a tentative *agenda* was submitted beforehand by D.G.M.S., discussions of important topics were commonly introduced without previous notice of any kind. No shorthand minute was taken and only the scantiest records were kept. The resultant action was necessarily left to the officer primarily concerned, who might in important matters refer to the Minister for written confirmation of instructions given verbally in the conference room.

The fact that the plan of holding regular representative meetings was after two or three months allowed to lapse seems to indicate a growing realisation of the drawbacks inherent in so loose a procedure. Mr. Montagu, in August, 1916, said he understood they had been abandoned because they became " so stormy " ; Sir Frederick Black was more explicit. The meetings, he said, were too big. There were no systematic preliminaries. Consequently, many came to the meetings uninterested in a great proportion of the business that came up for discussion, and not knowing exactly what was coming up were very often unprepared with the necessary information for dealing with it.

About the time when these meetings were abandoned the shortcomings of the Ministry's organisation were strongly emphasised in a confidential memorandum[2] submitted to Mr. Lloyd George by a Finance Committee on Economy which he had appointed, the members of which were Mr. Sam Lever, the Assistant Financial Secretary, Mr. John Mann, Mr. Rothschild, and Mr. Palmer.

---

[1] C.R. 4514. [2] 22 March, 1916. C.R. 4383.

The Committee stated that they had "noted with steadily growing alarm the absence of any thorough plan of organising the work of the supply sections." The internal arrangements had not kept pace with the enormous growth of the work. There were now signs of serious dislocation and lack of co-operation, due partly to the immensity of the machine, partly to overwork, and partly to personal jealousy. The Committee was impressed with the ability and loyalty of heads of departments; but it was convinced that many of them were very seriously overstrained and that a rearrangement of the work was absolutely necessary. The leading men were so overburdened that they could not take a comprehensive view of the whole situation.

The Committee accordingly made the following suggestions:—

"1. That some machinery should be set up at once to supervise and co-ordinate the duties of the leading departments dealing with production and supply.

"2. That the analogy of large industrial concerns with manufacturing branches should be followed, so far as possible, by establishing a small central directorate or central Board responsible for the management and efficiency of the whole.

"3. That the Board should contain one or two prominent men of affairs of high directing ability and of standing sufficient to command the respect of heads of departments. They would have to give their whole time to the work. The Committee did not suggest the displacement of any of the existing staff. The chief executive officers would still, of course, have personal access to the Minister, but all executive instructions would be issued to them through the Board, on behalf of the Minister.

"4. The leading officers of the department should not be members of the Board, but should have ready access to it to submit reports and discuss their difficulties.

"5. A Secretary, with organising and commercial experience, should be appointed to devote his whole time to the work of the Board.

"6. Without relieving any department of its existing responsibilities, the duties of the Board should include:—

"(*a*) the consideration, and, where necessary, the reorganisation and subdivision of the duties of each section, and recommendation to the Minister of fresh appointments where deemed desirable;

"(*b*) general supervision and direction over matters of supply in the different departments of the Ministry, with a view particularly to securing a proper co-ordination between the different branches concerned with the production, transport, and supply of munitions up to their completed stage;

"(*c*) general supervision of the management of the National Shell Factories and National Projectile Factories."

No action appears to have been taken on these proposals, and the problem of devising an effective system of central control remained unsolved when Mr. E. S. Montagu succeeded Mr. Lloyd George as Minister of Munitions.

II. Difficulties of Direct Ministerial Administration: Mr. Montagu's Experiments in Co-ordination.

"When I was told that I had to make a statement on the Munitions Department, I cast my thoughts back over the matters with which I had to deal on that particular day.

"I began with a friendly controversy with a Government Office about the transport from near the Arctic Circle to a neutral country of a mineral, the name of which was unknown to me, but which I was assured was the limiting factor in the output of certain indispensable munitions. I went on to discuss the question as to whether we should press the India Office, in the interests of the munitions supply, to construct a certain railway line in a remote part of India. There was a question of certain measures affecting the output of gold in South Africa. There was a discussion as to the allocation of a certain chemical, very limited in quantity, to meet the competing needs of the Army, the Navy, and the Air Service. There was a deputation from an important educational institution asking to be allowed to continue certain building operations. There was a discussion about the men deported from the Clyde. There was a discussion on certain contracts in America valued at over £10,000,000 sterling. In the course of the morning the Munitions Inventions Department brought to see me some walking specimens of exceedingly ingenious artificial legs. There was a conference on the allocation of several highly skilled workmen of a particular class amongst competing firms. There was a discussion as to the quickest means of manufacturing gun carriages. There were a hundred and one topics which must confront any body of men who spend their whole days watching curves which ought always to go up and figures which ought always to swell; reading reports from all parts of the world, and confronted always with the cry, 'More, more, more!' and 'Better, better, better!'"—Mr. E. S. Montagu.[1]

(*a*) The Conference of 22 August, 1916.

On 22 August, 1916, six weeks after taking up office as Minister of Munitions, Mr. Montagu summoned a conference of heads of departments to discuss the best means of securing relief for the Minister in his arduous duties and ensuring smooth working and co-operation throughout the department.[2] Speaking as "an unprejudiced observer," and after testifying to his growing appreciation of the work of the Ministry, he said :—

> "I do feel there is one thing that wants supplying—you may think I am wrong, and I want you to say if you do—I do not think we have yet devised the system, which would have existed in an old-established Government concern, for the proper organisation and inter-relation of the various departments of the Ministry. I do find that there are questions affecting, let us say, supply on the one hand and labour on the

[1] 15 August, 1916. *Parliamentary Debates* (1916), *H. of C.*, LXXXV, 1691.

[2] Hist. Rec./R/263/5. The meeting was attended by : Sir F. W. Black, C.B., Sir H. Llewellyn Smith, K.C.B., Sir Glynn West, Sir R. Sothern Holland, Mr. S. H. Lever, Mr. Edmund Phipps, Mr. Charles Ellis, Mr. A. Mc D. Duckham, Mr. A. Herbert, Colonel L. C. P. Milman, Mr. K. M. Price, General Du Cane, Mr. Llewelyn, Mr. P. Hanson, Mr. James Stevenson, Lord Elphinstone, Mr. W. T. Layton, Mr. George Booth.

other which may be decided without proper consultation between the two departments. . . . Now, in an old-established Government department, manned, as the departments I have been accustomed to are manned, by civil servants working under conditions in which time is not a very important factor, in which time only really ever becomes important because of some threatened debate in the House, the whole of that difficulty is got over by finding some civil servant who is the bottle-neck for all communications between the heads of departments and the political head. That has importance here. It has importance here because, quite rightly or inevitably, the key-note of the Ministry is putting responsible people at the head of responsible departments, and leaving them to conduct their businesses just as the head of a business in the commercial world would conduct it. But it makes the position of the political head of the Ministry extraordinarily difficult. He cannot regard himself, as he does in an old-established office, as a transitory fount, a telephone for communicating the activities of the department to the House of Commons. He has got to regard himself as a sort of epitome in himself of the permanent head of the department and the political head of the department, the sole focus for the co-ordination that exists. Well—I do not say it with a desire to shirk responsibility—I do not think that is fair to him, and I do not think it is the best way of securing co-ordination between the departments and the Ministry."

Mr. Montagu proceeded to outline two alternative methods by which this deficiency could be met.

"There has been a suggestion that we should establish here in the Ministry a Board of Directors who should meet at stated intervals and have before it a picture of the combined activities of the different businesses that you desired to control—a Board, let us say, of six or seven. That Board would have no executive responsibility at all. It would meet, it is suggested, under the Chairmanship of the Minister, or, in his absence, of the Parliamentary Secretary. . . . . I do not know how that Board would be constituted. . . . . It seems to me it would have to be manned from the existing personnel of the Ministry. Then how would you appoint it? Would you appoint it from among the heads of departments? If you did, would it consist of all the heads of departments? . . . . . Should the Minister be the Chairman of the Board of Directors, or should he not? One suggestion is that the Minister should be the President of the Council, rather like the Army Council or the India Council, to whom questions of policy should be, if not by Statute, by Minute, referred. Gentlemen, I was Under-Secretary of State for India for some time, and I have a prejudice against the formation of a Council which would in any degree lessen or share the responsibility of the Minister."

> "Now I will put before you another scheme. I have been studying the plan of the organisation of the French Ministry of Munitions, in which there is a sort of body which, as I understand it, is not comparable entirely to our Secretariat, but which is called the office of the *Chef de Cabinet.* The *Chef de Cabinet* is a personal assistant to the Minister, who has his own department, in a way a kind of Board of Directors, but much more analogous to a Staff in an army."

Mr. Montagu then went on to explain the sort of way in which such an officer would work. He would receive the weekly report of the Director of Statistics and would find that a certain matter which was causing anxiety or might cause anxiety was requiring attention. He would find, for example, that the supply of shell was not up to estimate; he would go to the head of the Shell Department and would perhaps be told that this was due to an alteration in design, or a shortage of labour. He would then go, let us say, to the Labour Department. The Labour Department would report that it was not due to any shortage of labour, but owing to the stiffness of a particular factory in accepting the labour that had been found. He would then write a history of the matter under dispute, and would lay it before the Minister, and recommend that a conference should be called representing the departments concerned.

> "Both of these schemes have this in common, that there is no suggestion of putting anybody with executive responsibility over departments. Both of these schemes have the one feature in common that they should form the machinery for bringing departments together, and for making sure that inter-departmental questions which ought to be considered are not forgotten."

The whole of the subsequent history of the centralisation of the Ministry may be regarded as a commentary on the above speech. A year was to pass before an organisation satisfying Mr. Montagu's requirements was set up, though the Munitions Council organisation, as framed by Mr. Churchill, followed on the experiments inaugurated by Mr. Montagu and continued by Dr. Addison, in the development of which, as will later be seen, the idea of a *Cabinet du Ministre,* though not formally adopted, had an important influence.

In opening the discussion, following Mr. Montagu's address, Dr. Addison urged that no plan should be adopted which might imperil the frank and close relationship between the heads of different branches and the Minister. Commenting on the proposal to appoint a *Chef de Cabinet,* he urged that the position of such an individual, if he was to do any effective work, would be one of extreme difficulty: "I do not think if you made him a mere adviser or right-hand man to the Minister he would live very long." If, for example, he drew attention to certain things which wanted looking into and was then asked to

bring together the officers concerned he would immediately become an executive officer. As executive officer he would be likely both to have more than he could do and, further, to come in between the Minister and the heads of departments in a way they would sometimes resent. Therefore, the question at issue was whether it would be better to have a single executive officer or a Board. He preferred the latter as a more effective method of settling questions of policy and arriving at definite decisions. "I think that everyone of the big heads of the different branches round this table would work more smoothly with a Board than they would with a single individual. I think there would be less likelihood of friction, that the Board would be more powerful, would have more machinery at its hand, and would probably get on better with heads of sections."

Summing up the subsequent discussion, after every officer present had expressed his views, Mr. Montagu noted the unanimity with which it was agreed that the existing organisation was defective. Since the *Chef de Cabinet* solution had not received any considerable measure of support, he decided to abandon that proposal. Two further steps would, however, be taken. Periodical meetings of heads of departments, probably on a fortnightly basis, would be re-established; and, secondly, a small advisory committee would be appointed with a secretary and not less than three or more than seven members. As to the constitution and powers of this body, he invited suggestions from those present. He himself hoped to preside at the meetings of the committee when appointed.

(*b*) The Fortnightly Meetings.

The first of the Minister's Fortnightly Meetings with Heads of Departments was held under Mr. Montagu's presidency on 12 October, 1916, and the series continued without a break until the end of Dr. Addison's tenure of office at the Ministry. Mr. W. T. Layton, Director of Requirements and Statistics, acted as Secretary. Only four of the meetings fell within Mr. Montagu's term as Minister, and the last two of them he was unable to attend. These and nearly all subsequent meetings were presided over by Dr. Addison.

At the first meeting Mr. Montagu announced that he intended to work on a carefully prepared *agenda*, and to summon to each meeting only those who were interested in the business. Continuing, he said that the Ministry had grown much since the practice of holding periodical conferences with heads of departments had been instituted by his predecessor.

> "Every day, if I may exaggerate, new departments and new branches are added to the Ministry. Each addition makes it all the more important, in my opinion, that the heads of departments should know something of what is going on in other departments. . . . It is essential that before we

> undertake to fulfil requirements we shall consult together as a Ministry as a whole, and see whether one new activity will affect, and how far it will affect, old commitments already undertaken. . . . Both in material and in man power the more we do the shorter we become, and our aim, if we are going to husband these resources, ought to be to act collectively so that there shall be no overlapping, as little competition and as high a degree of economy of common services as possible."

This passage may be taken as striking the key-note of the meetings which followed in the next ten months.

The principle observed in regulating discussion was to avoid descending into detail, except in matters in which more than one department was concerned, and in cases where a comparison of the information and opinions contributed by different members made it possible to frame a decision or to set on foot further enquiry. Since the Minister presided, he was able to communicate or interpret the policy of the Government, and, on the other hand, to consult his subordinates on points of policy which he intended to submit to his own colleagues. He was also able to announce decisions arrived at as the result of meetings with the General Staff or of conferences with the Allies. Questions involving relations with other Government Departments were occasionally raised. From January, 1917, the Master-General of the Ordnance regularly attended the meetings. His presence did much to bridge the gap between the Ministry and the War Office, and he was frequently in a position to give authoritative interpretations of the views of G.H.Q., France. But the principal part of each meeting was occupied with questions arising out of the Weekly Report. Heads of departments gave explanations of real or apparent shortages and arrears. Causes of delay were cleared up, and it was frequently possible to arrange then and there for co-operation between departments in removing difficulties.

A few of the innumerable topics ventilated in the course of the ten months may be mentioned: the classification of factories and stores for the guidance of the Vulnerable Points Committee, according to the urgency of their need of protection from hostile aircraft; the proposal of a special committee to study economy of material; the necessity of controlling the remaining uncontrolled metals; the release of men from the Army; the duties of heads of departments in relation to the Inter-Ally Munitions Bureau; the desirability of making more systematic use of the Local Boards of Management; the best method of co-operation with the United States after its entry into the war; preparations for "reconstruction."

At the twenty-first and final meeting, on 24 July, 1917, Dr. Addison said that the frank discussions which had been the outstanding features of the meetings had laid the foundations for some of the most important departures in policy and fresh undertakings for which the Ministry had been responsible.

(*c*) THE ADVISORY COMMITTEE.

Meantime, as foreshadowed at the conference on 22 August, 1916, an Advisory Committee was constituted on 3 October, 1916, with the following membership :—

Mr. A. McD. Duckham (Chairman).
Mr. J. Stevenson (Vice-Chairman).
Sir Frederick W. Black, C.B.
Mr. Stephenson Kent.
Mr. S. H. Lever.
Sir Ernest W. Moir, Bt.
Sir Alexander Roger (added on 25 January, 1917).

On the dilemma as to whether the members should remain executive heads of departments or not, a compromise was made. The Chairman and Vice-Chairman, on whom the bulk of the work was to fall, were relieved of their departmental duties, Sir Arthur Duckham handing over the Small Arms Ammunition Department to his brother Mr. Alexander Duckham, and Sir James Stevenson handing over the Department of Area Organisation to Mr. McLaren. Mr. G. D. Hutchins was appointed Secretary to the Committee.

The Committee's terms of reference were thus announced :—[1]

> "A Standing Departmental Committee will be set up to assist the Minister by their advice. The Committee will consider and report to the Minister upon such matters as may be referred to them by him (or by the Parliamentary Secretaries acting on his behalf), and will also confer with him or with them when required.
>
> "The matters so referred may be : (*a*) Questions raised by the Minister or the Parliamentary Secretaries. (*b*) Questions which, in the opinion of the Committee, are of immediate or future importance to the work of the Ministry and require special attention. (*c*) Questions suggested to the Committee by heads of departments of the Ministry.
>
> "Before taking up a question arising under (*b*) or (*c*) above, the Committee will refer to the Minister, in order to know whether he desires that the Committee should consider and report upon it.
>
> "When, for the purpose of any particular reference, it would be of advantage that the head of a department or branch which is concerned should be associated with the Committee, the Minister will add him to the Committee for that occasion.
>
> "Reference to and from the Committee will be made in writing, and copies will at the same time be furnished to the General Secretary."

In explaining the scheme on the occasion of the first Fortnightly Meeting (12 October, 1916), Mr. Montagu was careful to allay apprehensions which might arise from the assumption that the scheme was

[1] 2 October, 1916. General Office Notice No. 51.

a more radical new departure than was in fact the case. The Committee had no executive powers: it would not relieve the Minister himself of any responsibility or stand between him and the executive officers; nor would it cut across the ordinary procedure for reference of administrative questions from heads of branches through heads of departments to the Minister. The first principle had been that the responsibility of all officers should remain unaffected. No attempt had been made to make the Committee representative of the interests of all the departments. The members had been selected solely for their personal qualifications, and the Committee would be restricted to dealing with references on defined subjects which would otherwise have entailed the appointment of a departmental committee.

The Committee thus constituted continued to act until August, 1917, when its duties passed to Council Committees under the Munitions Council scheme then established. During this period exactly one hundred meetings were held, an average of rather over two a week. The Committee considered fifty references, and made reports on forty-five of these.

The references to the Committee covered the whole field of the Ministry's activities, and traces of its work will be found throughout the history of the Ministry within the period of its existence. The following is a roughly classified summary illustrating the various types of problems investigated:—

(i) *Creation of New Departments.*—The transfer of Aeronautical Supply to the Ministry, decided in general terms by the War Committee, was carried out in detail on lines recommended by the Advisory Committee. The following departments or organisations were also established on lines recommended by it: the Petrol Engine Department, the Agricultural Machinery Department, the Petroleum Supply Branch, the Central Stores Department, the Scrap Metals Branch, the Munitions Works Board, and the Reconstruction Department.

(ii) *Reorganisation of existing Departments.*—The organisation of the Machine Tool Department, the Priority Department, and the Department of Statistics was amended on lines recommended by the Committee. The Committee also made recommendations for the organisation of the Design and Inventions Departments, on which, however, no action was taken.

(iii) *Programmes.*—The Committee considered and reported on the means for carrying out the Gun Ammunition Programme for 1917, and later on the best method of distributing the proposed reduction of that programme. The working out of the 1918 Gun and Gun Ammunition programme was begun by the Advisory Committee and subsequently carried on by a Munitions Council Committee.

(iv) *Overseas Munitions.*—The first reference handed over to the Committee was "to consider and report on the best

method of organisation of the work to be done in connection with the supply of munitions in America." Other references dealt with the financial situation in America; methods of assisting the United States in the event of their entering the war; cables from the Imperial Munitions Board regarding Canadian shell and steel contracts; the possibility of munitions manufacture in Egypt, on which the Committee reported adversely.

(v) *Miscellaneous.*—In some cases the Committee recommended the establishment of a special Committee to take over the consideration of a reference made to them. Such was the origin of the Materials Economy Committee and the Committee on the Disposal of Government Stores. The Committee also made recommendations as to the scope and function of the Financial Advisory Committee. Other references concerned the effect of the proposal of the Man Power Board for the withdrawal of 33 per cent. of the munition workers between the ages of 18 and 26; the possibility of diverting shipping from munitions to wheat; the supply of mines by the Ministry to the Admiralty; the uses, demand for and supply of potash; the possibility of substituting amatol 80/20 for picric; the best means of increasing the supply of ball bearings.

The normal procedure adopted by the Committee was to invite the attendance at its deliberations of the responsible officers best acquainted with the problem under discussion, who were thus able to state their views or indicate their difficulties in person, a free interchange of view taking place round the table. A shorthand record was kept of the proceedings, and members of the Committee were thus able to review the evidence and to think over at leisure the bearings of facts put before them from whatever quarter.

The Committee's recommendations were submitted confidentially to the Minister. It might have been expected that this practice would give occasion for jealousy and suspicion. On the whole, however, the Committee's activities were remarkable for the absence of serious friction, which fact is the best evidence of the spirit in which they were conducted. Speaking at a meeting of the Committee, when a reference involving the possible extension of its own functions was being discussed, Sir Alexander Roger said: "All round the Ministry any such Board or Advisory Committee was viewed formerly with the most extreme distrust. In no case did I ever hear the thing welcomed. Everybody opposed it, and everybody was jealous of what was going to happen and whether power was going to be taken away from individuals. I have now been here for several meetings, and have seen you talk to all the various sections and various departments, and it has amazed me to see the *camaraderie* and *esprit de corps* which exists between yourselves and the rest of the departments."[1]

[1] A.C./73. 21 February, p. 18.

III. Developments under Dr. Addison—Attempts to reconcile Devolution of Ministerial Direction with Direct Access.

(*a*) Fresh Projects of Central Organisation.

When Dr. Addison passed from the post of Parliamentary Secretary to that of Minister, the Advisory Committee system and the meetings of heads of departments were in full operation. There was also a long series of committees—few of which had any degree of permanency or fixity of constitution—intended to secure consolidation between heads of departments, whose interests were mutually involved in the main issues of administration. This system of organisation was thus described by Dr. Addison on 28 June, 1917:—[1]

> "So far as possible allied departments are grouped under a number of Directors-General. In some cases those in charge of associated groups meet for the consideration of their common problems, whilst special committees deal with questions which arise in special departments. In order, however, to secure the consideration of big problems affecting many departments of the Ministry as a whole, we have a Ministerial Advisory Committee, consisting of Sir Arthur Duckham as Chairman, Sir James Stevenson as Vice-Chairman, with Sir Frederick Black, Sir Stephenson Kent, Sir Ernest Moir and Sir Alexander Roger as members. These gentlemen have considered and recommended schemes for dealing with many of our greatest and most difficult problems, such as those raised by the addition to our duties of aeronautical supplies, by the control of metals, the regulation of stores, and a large number of kindred subjects, and I cannot speak too highly of the help which they have ungrudgingly rendered."

Although this machinery marked a great advance on what had preceded it, it was not altogether adequate in the face of the ever-increasing complexity of the administrative problem. During Dr. Addison's tenure of office further experiments were tried and further schemes propounded, more particularly during the month immediately preceding Mr. Churchill's appointment.

The cause may be sought in two directions. Firstly, the magnitude of the problem itself continued to increase. The headquarters staff, which amounted to 5,000 when Mr. Lloyd George left in July, 1916, had reached 8,000 when Dr. Addison succeeded Mr. Montagu at the end of the year, and 12,000 six months later when the former gave place to Mr. Churchill. Meanwhile the increase in the number of separate departments was more than proportionate to the increase of staff. In July, 1916, there were five Directors-General, twelve heads of supply departments and about twenty-five departments in all. When Dr. Addison left the Ministry a year later there were nineteen Directors-General and Controllers, more than thirty supply departments and about fifty departments altogether. The burden of

[1] *Parliamentary Debates* (1917), *H. of C.*, XCV, 584–5.

co-ordination fell with crushing weight upon the Minister's shoulders. The effectiveness of the regular fortnightly conferences with heads of departments depended largely upon his personal presidency, and apart from these gatherings there was a daily or hourly succession of conferences in his room called for the purpose of adjusting matters which affected more than one department, and innumerable written references on points requiring individual decision.

In the second place, the Advisory Committee to which matters of administrative policy and development of function were commonly referred was not in a good position for dealing with concrete issues since its composition had been determined by personal rather than functional considerations, and it consequently lacked the essentials of a representative body. The large measure of success which it achieved afforded ample justification for its creation, but the position of a department whose concerns came up for investigation before such a body was not wholly satisfactory. As Sir Glynn West wrote in a minute to Mr. Churchill on 21 July, 1917, "the drawback of the Advisory Committee system is that the policy of the Ministry affecting a particular department may be decided on the advice of a Committee instead of on the advice of the head of the department who has responsibility for carrying it out. The only sound rule is that the persons who will be responsible for carrying out the policy should be the persons consulted."

There was, however, at this time no machinery whereby departmental difficulties would automatically come up for mutual consultation among the group of departmental officials primarily affected by them. With such machinery many of the direct calls on the Minister's time would have become unnecessary. The Advisory Committee could save the Minister time and trouble and reduce the likelihood of error by digesting for him and preparing recommendations upon the larger problems with which he was confronted. But since it was not empowered to make decisions, and since, in any case, it was empowered to advise only on such questions as had been referred to it by or through the Minister, it was not in a position to protect him from demands on his attention which might with better organisation be rendered superfluous.

(*b*) Devolution through Parliamentary Secretaries.

The direction in which relief was first sought was in a further development of the plan of allocating definite supervisory functions to the Parliamentary Secretaries. One of Dr. Addison's first official acts after his appointment as Minister was to issue an instruction[1] requiring that references to him on a number of specific topics should be made through one or other of the two Parliamentary Secretaries, Mr. F. G. Kellaway and Sir L. Worthington Evans. The former would deal

[1] 28 December, 1916. General Office Notice, No. 83.

with Labour, Housing, Erection of Works, Priority, Establishment matters, and Publicity; the latter with the principal Supply departments, Inventions, Inspection, and American Purchases. This reduced the number of departments entitled to refer directly to the Minister, but nevertheless those which were not allocated and which, for one reason or another, continued to enjoy direct reference were a formidable list, including Finance and Controlled Establishments, the Design department—whose chief, General Bingham, was also Military Adviser—Iron and Steel, Aeronautical Supplies, Mechanical Warfare, Mechanical Transport, Overseas and Inland Transport, Area Organisation, and, indeed, every other department not specifically allocated to a Parliamentary Secretary.

This arrangement was undoubtedly intended only as a step towards further developments, and indeed an arrangement by which a Parliamentary Secretary was interposed between the Minister and some departments only, while at the same time the privilege of "direct access" was tacitly maintained, was bound to lead to overlapping and confusion. Sir L. Worthington Evans, in a minute to the Minister of 9 July, 1917, wrote: "I venture to think that the chief cause of overlapping and wasted effort arises from the difficulty of reconciling 'direct access to the Minister' (which I agree must be recognised as a concomitant of 'business man' management) with delegation of the Minister's powers through Parliamentary Secretaries and Staff Officers. What happens in the rush of work is that during a 'direct access meeting' a grievance or difficulty is discussed and directions given without the Parliamentary Secretary or Staff Officer being informed, and two or more enquiries may be pursued on different papers at the same time by two or more officers, each thinking that the particular business is entrusted to him."

Sir L. Worthington Evans was supporting in the above minute a scheme drawn up the previous month by Mr. Michael Heseltine, one of the Minister's private secretaries, according to which the number of Parliamentary Secretaries was to be increased to four, and the whole of the departments allocated between them. Sir L. Worthington Evans, however, thought that the scheme would only meet the case on condition that the Minister would refuse to hold direct access meetings except in the presence of the appropriate Parliamentary Secretary, and would give whatever directions he desired carried out to the appropriate Parliamentary Secretary and hold him responsible for further action.

(c) Proposed Establishment of a Ministerial Staff.

An alternative mode of achieving this devolution of Ministerial responsibility had been put forward by Dr. Addison himself. This was the appointment of Staff Officers of high standing who should act as personal assistants to the Minister. This proposal had been

formally referred by Dr. Addison to the Advisory Committee on 31 February, 1917, in the following terms :—

> "I shall be glad to receive the considered views of the Advisory Committee on the Minister's Staff as discussed this morning."

The nature of the consequent discussion may be gathered from Sir Arthur Duckham's explanation of the reference at the meeting of the Committee. Large numbers of questions affecting more than one department were put up to the Minister, and often in a very undigested state. The latter was thus obliged to call conferences and spend time which he could ill afford. He did not get a properly considered statement put up to him in the first place on which he could say "Yes" or "No." Moreover, departments often took schemes to the Minister before they had been considered by the other departments concerned. The Private Secretary advised as to who should be summoned to the conferences, and parties who considered themselves vitally interested were sometimes omitted. The Minister therefore wanted some method devised by which he could be sure of reliable guidance in such matters. The Advisory Committee did this for him on the larger questions already. What was wanted was, first, a system by which the Advisory Committee or some other body could also deal with smaller questions ; secondly, a system by which the Advisory Committee could assist the Minister by following up action taken on their recommendations.

The Committee were of opinion that the Advisory Committee itself, reorganised to enable it to cope with its new duties, should be transformed into an executive "Staff." The main difference between the functions of the existing Committee and the proposed Staff would be that, whereas at present only selected topics came within the purview of the Committee, in future all administrative problems should be within the sphere of the Staff.

The difficulties in the way of this plan were admitted to be great. In the first place, the Committee was in no way representative of the department as a whole. Thus, for example, the departments of Finance (since the appointment of Sir Hardman Lever as Assistant Financial Secretary to the Treasury), Shell Filling, Aircraft, Design, etc., were unrepresented on it, and it was felt that the enlargement of the Committee to include all Directors-General and officers of equivalent rank would lead to the creation of an unwieldy and useless body.

On the other hand, it was not thought that it would be suitable for the Parliamentary Secretaries to become ordinary members of the Advisory Committee, particularly in view of the fact that they were liable at any time to be immersed in Parliamentary business, or their work to be interrupted by a change of position due to political considerations.

In the second place, the great increase of work would make it impossible for any member who gave adequate attention to it to

remain head of a department. The complete severance of the Staff from executive duties would unfit them, it was held, for the discharge of those duties, and the alternative plan, according to which the two "whole-time" members, the Chairman and Vice-Chairman, would get through the bulk of the work themselves with the assistance of a developed secretariat, would reduce the departmental members of the staff to an impossible position of responsibility for decisions in which they had had no real part.

The procedure the Advisory Committee finally recommended was as follows. The Committee as it stood should constitute the Staff. The two permanent members would meet daily at eleven and allocate all the smaller matters to sub-committees consisting of the heads of departments concerned, with a neutral chairman, who would be a member of the Advisory Committee and would lay the results of his work before the Advisory Committee, which would then assume responsibility for it. They also proposed that they should be empowered to take necessary steps for following up the results of the Minister's action on their decisions and to report to him from time to time.

These recommendations were not adopted in full, but on 19 March an instruction[1] was issued announcing that the Minister had requested the Chairman and Vice-Chairman of the Advisory Committee to give him special advice and assistance in questions which concerned more than one department, and which he might refer to them for the purpose. The Minister wished it to be understood that this would involve no alteration of the existing practice of consultation between himself and heads of departments. In the discussions the description "Staff Officers" was definitely used, and the term, though finally struck out of the office instruction on account of its awkward implications, gained a certain unauthorised currency.

(*d*) An Administrative Board.

A further extension of this idea was formulated on 1 June, 1917, by Sir Arthur Duckham, Sir Stephenson Kent, and Sir James Stevenson jointly. This was a proposal to create an administrative Board to consist of the signatories, together with Sir Sothern Holland, who were to be called Commissioners and who would stand between the Minister and his departmental officers. Thus, all papers which had hitherto been sent direct to the Minister or to the Parliamentary Secretaries would in future be addressed in the first instance to the Administrative Board. The radical character of this proposal was made more explicit by the statement that the success of the scheme was "absolutely dependent upon you (the Minister) and the Parliamentary Secretaries dealing with heads of departments only on questions which have been through the Administrative Board's hands. Otherwise conflicting instructions and misunderstanding must certainly arise, and the position of the Commissioners become

[1] 19 March, 1917. General Office Notice, No. 106.

untenable." The Board would also be represented at all discussions between the Minister and heads of departments.

This proposal was open, in a higher degree, to the criticism of Sir Glynn West upon the Advisory Committee already quoted, and it was obviously incompatible with the maintenance of the cherished privilege of direct access. It threatened to protect the Minister even too effectively by interposing an impenetrable barrier between him and his departmental chiefs.

In a memorandum[1] criticising the proposal, Mr. Piggott and Mr. Heseltine, the Minister's private secretaries, indicated an even more fatal objection. They pointed out that there was a real danger that such a Board would hamper or disable Ministers in the discharge of their constitutional responsibility towards Parliament. "It is inherent in such responsibility," they wrote, "not only that Ministers must be able at short notice to have before them facts in regard to complex negotiations and difficult cases, but that they must in many cases involving important policy, or even the fortunes of the Government of which they are members, take a personal part in matters which are likely to lead ultimately to discussion in the House or to public criticism of the course adopted. . . . . One test of any such scheme as the present is therefore whether it maintains Ministerial responsibility and all that is included in that term unimpaired. We may take as an example the attitude both of employers and of trade unionists during the recent engineers' strike. People attach an importance, which may be exaggerated, to laying their grievances before Ministers in person. This involves very often a great waste of time, but we believe it to be due at the bottom to the sound constitutional feeling that responsible Ministers, and they alone, can handle grave issues effectively and with a full sense of their duty through the House of Commons to the public. We think, further, that the settlement of the strike illustrates another truth closely bound up with the theory of responsibility to Parliament, namely, that personal contact with an effective Minister ultimately proves the shortest and most satisfactory way of bringing troubles to a head and obtaining their settlement."

After pointing out other difficulties in the way of the scheme, the unacceptability of the scheme to heads of departments unrepresented on the Board, and the impoverishment of certain departments by the removal of their existing heads to become members of the Board, the writers proceeded to suggest that a department would be apt not to accept the decision of the Board in any vital contentious matter. They insisted that an immediate, practicable improvement of procedure would result if the mode in which difficulties were submitted and instructions given were formalised. What was needed was that references to Ministers should be made in writing, with a self-explanatory file. In so far as some heads of departments did not at present send up their papers in proper form, they should be instructed how to do it; but this was hardly the task of an Administrative Board.

[1] 8 June, 1917.

This was a civil service criticism on the methods of the Ministry, and was subsequently met by Mr. Churchill's reorganisation. It did not affect the central point at issue, the solution of which was not found at this time, but was still a matter of acute controversy when Dr. Addison left the Ministry of Munitions and was succeeded by Mr. Churchill.

IV. Mr. Churchill and the Munitions Council.

" The principle of that organisation [the Munitions Council] consisted in dividing the seventy odd departments of the Ministry into eight or ten large groups, and placing at the head of each group a Member of the Council to exercise a general and direct supervision over the whole area . . . . The bulk of the Council's work is done by committees of three or four Members of the Council specially concerned with any particular subject, and there is a standing committee of the Council, a ' Co-ordinating Committee,' which considers and clamps together the proposals of the different departments.

" Side by side with this system of committees I have largely extended the functions and increased the numbers of the Secretariat, obtaining for that purpose the best permanent Civil Servants that could be found. Without a nucleus of Civil Servants to deal with procedure, with the movements of papers, and with discipline, the business of no Public Department could, in my opinion, be satisfactorily conducted."—Mr. Churchill.[1]

(*a*) Origin of the Group System.

When Mr. Churchill became Minister, Sir L. Worthington Evans laid before him a memorandum describing the position as regards central control, in which he attributed the failure of the present arrangements largely to the fact that " it was possible for instructions to be given direct to an officer without the Parliamentary Secretary or the Staff Officer specially entrusted with some enquiry or duty being informed." He added: " ' Direct access,' is, I think, necessary having regard to the very special staff employed in the Ministry, and naturally the Minister must reserve his right to see whom he wishes when he likes; nevertheless, steps can, I think, be taken to prevent ' direct access ' destroying discipline and interfering with the ordinary conduct of business. The staff at the Ministry are, as a rule, big men, and they don't want ' direct access ' to be made a fetish; if the position is put to them I feel sure they would agree to a modification of the previous practice."

After referring to the scheme for dividing the responsibility for supervision of departments among four Parliamentary Secretaries, Sir L. Worthington Evans added: " I ought perhaps to say why so much appears to be expected of the Parliamentary Secretaries. In the Ministry there are no positions held by permanent Civil Servants comparable with the permanent chiefs in other Departments of State. While there are some most able and devoted Civil Servants, they have not been used in the same way as in other departments. Business men have accepted the Parliamentary Secretaries as representing the

[1] 25 April, 1918. *Parliamentary Debates* (1918), *H. of C.*, CV, 1154–5.

Minister, and so the organisation has developed round the Minister and the Parliamentary Secretaries."

The two principles implicit in this statement were to become the foundation stones of the reconstituted organisation established by Mr. Churchill. They were :—

1. The grouping of departments.
2. The re-establishment of Civil Servant control over departmental procedure while retaining unimpaired the Business Man's executive freedom.

In the foregoing pages there will be found numerous foreshadowings of the group idea, which in itself was little more than an axiomatic principle of large scale organisation, whose application to the circumstances of the Ministry had been restricted, not on grounds of theoretical justification, but by reasons of personal inadaptability. Thus the persistent suggestions for the creation of a Council or Board of restricted membership, propounded from time to time, had been put forward rather as a counsel of perfection than as a practical policy; though, as has been seen, some tentative steps in this direction had been taken, firstly, by an allocation of responsibility among Parliamentary Secretaries, and, secondly, by endeavours to claim for the Advisory Committee some measure of executive power.

Thus, long before Mr. Churchill's appearance, the grouping plan had found adherents in the Ministry, and had been in particular advocated by Sir Frederick Black and Sir Glynn West, whose experience dated back to the earliest experiences of this department. Sir Frederick Black had developed the idea, based upon his experience of administration in the Admiralty, not only in connection with his repeatedly expressed belief in the principle of an executive Board or Council, but with still more explicit emphasis in connection with discussions during the months preceding Mr. Churchill's appointment on the proposal to appoint four Parliamentary Secretaries. On 25 June, 1917, he had suggested that each of these officers should be the head of a group of departments, which might be distinguished as Finance, Labour, Supply, and Engines respectively. He further proposed that each Parliamentary Secretary should have attached to him a Group Secretary, " who would devote his whole attention to minutes of proceedings and the calling of meetings. In many cases the meetings would be called together at short notice for brief discussion to assist the Parliamentary Secretary in deciding or advising the Minister."

An equally matured proposal was formulated by Sir Glynn West in a minute addressed to Mr. Churchill at the time of the latter's appointment: " My suggestion is that the time has come when the Ministry should be organised in a number of large units, each dealing in its entirety with one of the large governing factors, each in charge of a Head directly responsible to the Minister." The groups indicated were Labour, Materials, Supply, Design, Transport, Finance. Under such a system " the Minister would be able to obtain at first hand

on questions of policy affecting all matters appertaining to each unit of the organisation the view of the person actually responsible for carrying the policy adopted into effect."

(*b*) The Planning of the Munitions Council.

In the course of his first month in office Mr. Churchill and his advisers elaborated a scheme which, in so far as it worked satisfactorily from its inception down to the time of the Armistice, when it was superseded by a similar organisation adapted to the changed circumstances, solved the problem of central control. It solved the problem because it met the difficulties already noticed, which may be recapitulated as :—

(i) The difficulty of finding a "Board" or "Staff" that would be

(*a*) representative of the Ministry,

(*b*) not too large for business purposes,

(*c*) in touch with the executive departments yet not overwhelmed with the executive work.

(ii) The difficulty of finding machinery by which difficult decisions on disputed points could be taken without encroaching unnecessarily on the Minister's time and without taking control of the decision away from those responsible for carrying it out.

(iii) The difficulty of introducing regular methods of intercommunication into an emergency department.

These obstacles were overcome by the establishment of the group system with "Members of Council" at the head of each group; by the institution of Council Committees and Secretarial Officers; and generally by the strengthening of the Civil Service element throughout the Ministry.

Mr. Churchill became Minister of Munitions on 20 July, 1917. After carefully taking stock of the situation his decision as regards the central point at issue was prompt and decisive. There should be created a central co-ordinating authority within the Ministry analogous to the Board of Admiralty with whose working he was so closely familiar. All efforts were now directed towards the formulation of a satisfactory scheme, and all the principal advisers within the Ministry were invited to draft proposals on the lines indicated. In the earliest project submitted by Sir Frederick Black on 25 July, 1917, the "Groups" took the form of actual standing committees composed of the heads of cognate departments, and presided over by "Chairmen." "The underlying principle is that decisions will be given or recommendations made to the Minister by a committee which will primarily consist of the heads of departments concerned." There would be

Distribution Secretariat under a permanent head which would be responsible for the circulation of documents. Six committees were suggested representing :—

1. Finance and General.
2. Materials and Transport.
3. Design, Inspection and Invention.
4. Production of Ordnance.
5. Aeronautical Supplies, Mechanical Transport, etc.
6. Labour, etc.

On 30 July, 1917, proposals were put forward, at Mr. Churchill's instance, by Sir Arthur Duckham and Sir James Stevenson. The six "Chairmen" had now become eight "Members of Council." Their functions were (i) to consider on the Minister's behalf all questions put up to him by heads of departments ; (ii) to act as the co-ordinating element between the departments ; (iii) to ensure that general policy as laid down by the Minister be carried out. The relations of the Members of Council to the heads of departments within their groups were somewhat vaguely indicated. "In respect of the group allotted to him each Member should carry out such administrative functions as the Minister may direct from time to time. He should hold a watching brief for the Minister on the organisation and work," etc. The Members were not themselves to be heads of departments. The Council as a whole was to meet at least once a week, and was to continue to discharge the functions at present discharged by the Advisory Committee.

"The proper working," the draft continued, "of the above scheme can only be assured by the establishment of an efficient Council Secretariat to be administered by the Secretary to the Council." An "Assistant Secretary" was to be attached to each Member of Council "and should be responsible for the preparation and necessary action being taken in connection with all matters concerning only the Member of Council to whom he is attached." Matters concerning more than one member were to be sent to the Council Secretary, who would summon the necessary conferences. There was to be a daily meeting of the Secretary and Assistant Secretaries, at which all papers and subjects would be allocated, conferences arranged, etc.

Proposals on somewhat similar lines were also put forward by other officers of the Ministry. Sir Glynn West developed his earlier proposals for organisation under Groups, the distinctive characteristic of his scheme being the emphasis laid upon industrial classification. In particular, he urged the inclusion under one chief of all administration which involved the control of forging and machine shop capacity, the crucial issue here involved being the amalgamation of aeronautical supplies and ordnance. The engineering capacity required for aeroplane engines was practically identical with that needed for gun mechanisms, mechanical transport and fuses, and the maximum flexibility in

interchange of plant would be secured by united direction of these various services.

Mr. Edmund Phipps, the General Secretary, agreed with the policy of grouping branches under a limited number of officers, but foresaw difficulties in the creation of a formally constituted Council. What was needed was "to revert to the principles on which up to a certain time our organisation was based, and from which we very unfortunately departed, not deliberately but by a series of accidents." In March, 1916, the whole organisation had been controlled by six principal officers, and these few persons could speak for the whole department. But "a series of steps were then taken which destroyed all principle in the arrangement," and subordinate departments broke away and on purely personal grounds were elevated to independent status. Thus Sir Sothern Holland was made Director-General of an Inspection Department, and shortly afterwards Sir Albert Stanley became Director-General of Mechanical Transport. This was soon followed by the appointment of Colonel Stern as Director-General in charge of "Tanks." As time went on the Priority Department was able to show cause for becoming independent, and a re-grading in the Finance Department, justified by the number of promotions elsewhere, gave them two Directors-General under the Assistant Financial Secretary. This was inevitably followed by the head of the Contracts Branch becoming Director-General and consequently independent. New departments added to the Ministry, such as the Aeronautical Department, Petrol Engines Department and the Agricultural Machinery Branch, had been dealt with in the same way.

Mr. Phipps expressed grave doubts as to the possibility of making any satisfactory division between the responsibilities of the Members of Council for the departments within their group and the responsibilities of the heads of departments. He would have preferred to see the Groups themselves organised into single departments with the Members of Council as "Heads of Departments in the ordinary Civil Service sense."

The suggestions above propounded were communicated by Mr. Churchill to Sir Graham Greene, the Secretary of the Admiralty, in order that the latter might bring to bear upon the problem his unique experience of the organisation by groups of the activities of a great Department of State. On 1 August, 1917, Sir Graham Greene submitted an alternative scheme, dividing the department of the Ministry into six groups. He rejected the suggestions of an Advisory Council and the institution of departmental committees to assist Members of Council, as likely to hamper the necessary freedom of action of the Minister and of Members of Council respectively. He emphasised the need for giving Finance a more prominent position than that suggested in the draft schemes which had been communicated to him. The financial Member of Council, he suggested, should be one of the Parliamentary Secretaries, and his pre-eminent position should be recognised by making him Vice-President of the Council. The question of the status of the principal financial officers continued to receive

most careful consideration. After mature deliberation it was finally decided to appoint a Finance Member of Council independently of either Parliamentary Secretary. Subsequently the original proposal was reverted to and the supervision of finance was specifically delegated to a Parliamentary Secretary.[1]

As regards machinery, Sir Graham Greene recommended that the Assistant Secretary at the head of the Council Secretariat should be deputy to the Secretary. He would be supported by a staff of secretaries attached to Members of Council and by a sufficient central office and registry staff.

A few days later Sir Graham Greene was appointed Secretary of the Ministry of Munitions and became primarily responsible for instituting the new organisation, as a general basis for which the plan put forward in the foregoing letter was adopted after being amended and approved by a Committee appointed by the Minister on 9 August under Sir Graham Greene's chairmanship.

About 15 September the Council Secretariat was placed in charge of Mr. Masterton Smith, who was transferred from the Admiralty and made Assistant Secretary to the Ministry of Munitions, his functions being those already laid down for the Supervisory Assistant Secretary in Sir Graham Greene's proposals.

(c) Establishment of the Munitions Council.

On 18 August, 1917, exactly four weeks after his introduction, the Minister was in a position to issue a printed memorandum[2] on the organisation of the Munitions Council, announcing the new constitution and tracing the need for it to the changed conditions of the Ministry's work. He said :—

> "The conditions under which the Ministry of Munitions was created were those of intense war emergency. The vital need of supplying the armies in the field with adequate, abundant and finally overwhelming supplies of ammunition, guns and war material of all kinds, necessitated and justified every expedient and the suspension of all ordinary rules. The immense and then unmeasured resources of the United Kingdom afforded an ample field for the enterprise and energy of departmental direction and for the organising capacity and bold initiative of British business men. Supplies were freely drawn from all parts of the Empire, and purchases from neutral States were used to supplement any deficiencies. As new needs arose they were met. Department was added to department. Military requirements were not only satisfied but anticipated. Vast programmes were successfully carried through. The

[1] A full discussion of these developments, and the position of Finance in the general scheme of organisation, will be found in Volume III, Part I.

[2] Hist. Rec./R/200/27.

British armies became the best equipped and most formidably armed in Europe. This process still continues and will become increasingly pronounced.

"But after these great efforts, and in the fourth year of the war, we are no longer tapping the stored-up resources of national industry or mobilising them and applying them for the first time to war. The magnitude of the effort and of the achievement approximates continually to the limits of possibility. Already in many directions the frontiers are in sight. It is therefore necessary not simply to expand, but to go back over ground already covered, and by more economical processes, by closer organisation, and by thrifty and harmonious methods, to glean and gather a further reinforcement of war power.

"It is necessary for this purpose that the Minister of Munitions should be aided and advised by a Council formally established. The time has come to interpose between more than fifty separate departments on the one hand and the Minister on the other, an organism which in the main will play a similar part and serve similar needs as the Board of Admiralty or the Army Council. It has been decided therefore to form the departments of the Ministry into ten groups, classified as far as possible by kindred conditions, placing in superintendence over each group an experienced officer of the Ministry, and to form these officers into a Council for the transaction of business of all kinds in accordance with the general policy which the Minister receives from the Cabinet.

"It is believed that this can be accomplished without impairing the responsibility or hampering the initiative of the heads of existing departments of the Ministry. It is after all modelled on the only system by which it has been found possible to exercise the control of great armies in the field. The functions of superintendence are distinct from those of direct executive and administrative action, and, wisely exercised, are not a hindrance to it but a stimulus and support. It is indispensable that persons near the heads of very large organisations should not be smothered by detail or consume themselves in ordinary day to day business, but that they should have opportunity and freedom to take wide and general views, and to search resolutely and anxiously amid the incidents of business for the dominant truths. With a proper comprehension of their respective functions, there should be no conflict between the fullest simultaneous exercise both of superintendence and action.

"Another indispensable feature of office organisation lies in the development of a trained and efficient Secretariat. The direction and distribution of the flow of official papers among all the departments, and the means taken to concert the action of the various departments and authorities concerned in each

class of business, the recording of action and the circulation of information of all kinds, constitute a sphere second only in importance to decisions on policy and merits. Experience shows the value for these purposes of a strong element of trained Civil Servants, thoroughly acquainted with official methods and inter-departmental relations. Recourse at this juncture to a Council of business men already closely associated with the development of the department together with the strengthening of the Official Secretariat, should enable the Ministry, in spite of the increasing difficulties and strain of the war, to continue to render good and remarkable service to the State."

This document was submitted to His Majesty the King on 18 August, 1917, who graciously signified his approval.

Such was the basis on which the new organisation was to be built. The actual procedure involved was more fully explained in a general office instruction[1] issued at this time. It was laid down that the Council should consider " such matters as may be referred to it by the Minister and any matters which may, with the Minister's approval, be brought before the Council by any member of the Council." " Under rules approved by the Minister, important questions involving more than one group of departments will be considered at committee meetings and conferences which the members of the Council representing the groups concerned will attend." The duty of a Member of Council in relation to his group of departments was formulated as follows :—

" (i) To superintend generally the work of the group and to consider in the first instance all important questions upon which the head of the department requires assistance or rulings, such as those which would previously have been submitted to the Minister or through the Parliamentary Secretaries, and either to decide on the Minister's behalf such questions, or to refer them to the Minister with a recommendation as to the decision.

" (ii) To exercise such administrative functions through the heads of departments in his group as are necessary to ensure that the policy of the Minister is carried out."

Meanwhile, heads of departments would continue to be responsible for the efficient administration of their departments, and the necessary executive action would be taken by them, but all important questions, particularly matters that might affect general policy or other departments, or which from their magnitude or novelty required financial sanction, would be referred by them to the Member of Council to which their group was attached.

Speaking on 11 December, 1917, at one of the rare meetings of heads of departments which now took the place of the Fortnightly Meetings (only six in all were held during Mr. Churchill's eighteen months of office), he said : " I want the heads of departments to look

[1] General Memorandum, No. 21, 18 August, 1917. See Appendix X.

upon the Council Member of their group as if he were a more accessible Minister, to whom they could much more readily and easily have recourse. I believe that in that way they ought to find it possible (I do not know whether they have yet) to get decisions somewhat more quickly than under the old system. I do not want the Munitions Council to detract from the responsibility of the heads of departments for managing their branches, and, as you know, the practice I wish to see observed is that, when there is a difference on any serious matter which cannot be compacted by the heads of departments and the superintending Member of Council, the matter should come on in the ordinary course to the Minister for settlement. That, I think, was clearly understood, and it figured in the original explanation of our system. The fact that in no single case has such an appeal been made to me is due either to the very satisfactory working of the system or to the very unsatisfactory neglect of the safeguard it provides. Which it is I do not know; but I have not in any case had to settle a difference of that kind."

The actual composition of the Council as originally formulated was as follows:—

Finance.—Member of Council "F," Sir Herbert Hambling.

Finance, Munitions Works Board, Controlled Establishments Finance, Munitions Contracts, Lands, Central Stores, Salvage.

Design.—Member of Council "D," Major-General the Hon. F. R. Bingham, C.B.

Design, Inspection, Trench Warfare Design, Munitions Inventions.

Steel and Iron.—Member of Council "S," John Hunter, Esq.

Iron and Steel Production, Factory Construction.

Materials, etc.—Member of Council "M," Sir Ernest Moir, Bart.

Non-Ferrous Metals, Scrap Metals, Development of Mineral Resources, Government Rolling Mills, Railway Transport, Overseas Transport, Trench Warfare Transport, Forwarding and Receiving, Railway Materials, Cranes, Optical Munitions, Potash.

Explosives.—Member of Council "X," Sir Keith Price.

Explosives Supply, Trench Warfare Chemical Supplies, Mineral Oil Production, Royal Gunpowder Factory (Waltham Abbey).

Projectiles, etc.—Member of Council "P," Sir James Stevenson, Bart.

Area Organisation, Gun Ammunition, Gun Ammunition Filling, Trench Warfare Ammunition—filling and supply other than trench guns and howitzers—Small Arms Ammunition, Munitions Gauges, Central Clearing Bureau, Timber.

Guns.—Member of Council "G," Sir Glynn West.

Guns and Carriages (Supply and Repair), Trench Guns and Howitzers, Machine Guns, Revolvers, Pistols, etc.; Rifles,

Bayonets, etc.; Royal Small Arms Factory, Enfield Lock; Royal Ordnance Factories, Woolwich.

Engines.—Member of Council "E," Sir Arthur Duckham, K.C.B.
Aeronautical Supplies, Petrol Engines Supply, Mechanical Transport, Mechanical Warfare, Agricultural Machinery, Electric Power Supply, Machine Tools, Stampings and Castings.

Allies.—Member of Council "A," Sir Frederick Black, K.C.B. (temporarily, Sir Charles Ellis, K.C.B.).

Labour.—Member of Council "L," Sir Stephenson Kent, K.C.B.
Labour Regulation, Labour Supply, Housing, Welfare.

Secretariat.—Member of Council "S," Sir Graham Greene, K.C.B.
Council Secretariat, Parliamentary and General, Legal, Requirements and Statistics, Establishment, Special Intelligence, Priority.

Very shortly afterwards an additional group was constituted for Requirements and Statistics, Mr. W. T. Layton being appointed Member of Council "R." In October, 1917, the Master-General of the Ordnance, Major-Gen. Sir W. T. Furse, K.C.B., D.S.O., was invited to become an honorary Member of Council, representing the War Office.

In February, 1918, the Engines Group was sub-divided, and Sir William Weir became Member of Council "A" in charge of an Air Group. In July, 1918, the remainder of the Engines Group was replaced by the newly organised Warfare Group, including Trench Warfare and Inventions, under Major-Gen. the Rt. Hon. J. E. B. Seely, C.B., C.M.G., D.S.O., M.P., who was appointed Member of Council "W."

It was at first contemplated that the Council of the Ministry of Munitions should be formally constituted by Order in Council, with the idea of enhancing its dignity and authority and placing it in a constitutional position comparable to that of the Board of the Admiralty or the Army Council. The advice of the Law Officers was, however, adverse on the ground that the powers to be exercised were already conferred upon the Minister by Statute and could be delegated by his authority. Consequently there were not, as in the case of the Army Council, powers to be exercised—additional to those conferred by Statute—which were dependent either upon custom or upon exercise of the Royal Prerogative.

(*d*) The Council Secretariat.

It was contemplated that the Council Secretariat would be composed of a group of Civil Servants under a supervising Assistant Secretary. The supervisory Assistant Secretary would be responsible to the Secretary for the general business of the Council and for superintending the work of the Secretarial Officers, who would individually look after the business which concerned his Group Member. There

was also to be a Chief Council Officer under the Assistant Secretary, who would maintain official records, attend conferences and meetings, and direct the clerical work and office administration of the Council Secretariat.

The primary task of the Group Secretaries allocated to individual Members of Council was the maintenance of an orderly procedure for the transmission of records, decisions and submissions. A fortnight after the composition of the Council was announced a memorandum[1] was circulated to govern these matters and regulate the position of the Chief Council Officer in relation to the Secretarial Officers of the Groups. This procedure ensured a proper centralisation and control of records relating to current business and aimed in addition at promoting the necessary interchange of information between Groups. The purpose was further promoted by the issue of a Daily Report containing brief memoranda contributed by the various Group Secretaries of questions submitted to Council Members and action taken thereon, and of important letters and documents received in the Secretariat. The issue of this Report was part of the work of the Chief Council Officer's department, and it was reviewed at the daily meeting of Secretarial Officers. The object, as Mr. Churchill put it, was that " there ought not to be business passing forward in any one branch of the Ministry which is not realised and understood by the other branches, and there ought to be sufficient knowledge spread among the heads of departments to enable any one of them to get into touch with any other department which he thinks he can help or which he thinks is taking some course which will upset him."

At a farewell dinner given to Mr. Churchill by heads of departments Sir Arthur Duckham emphasised this point, saying, " Another great thing Mr. Churchill did for us business men who came to the Ministry was that he made us appreciate the Civil Servant. Mr. Churchill backed the Civil Servant throughout in the Ministry, and rightly so. I am certain that all of us business men here feel that we are better men through having come in contact with red tape."

(*e*) The Work of the Council Committees.

Questions of procedure in regard to Council business and the relation of Groups to one another were discussed at the first meeting of the Council on 27 August, 1917. The system of titles in use within the Ministry was also considered, with the result that the title of Director-General was abandoned and the term " Controller " adopted for the principal heads of departments included in the Group of each Council Member.

The Munitions Council as such met fairly regularly once a week for the first few months. After that it met decreasingly often, it being found more convenient to devolve most of the work upon Council Committees.

Of these Council Committees there were 75 appointed between August, 1917, and November, 1918. Their membership was normally

[1] Hist. Rec./R/263.1/3.

a selection of Members of Council with the addition in the case of about half the Committees of two or three other officers of the Ministry. The Member of Council most directly interested was usually Chairman, and his own Secretarial Officer acted as Secretary.

The first Committee appointed was entrusted with the 1918 Programme, with the Minister as Chairman. It appointed 18 Sub-Committees, the chief of them being the Co-ordinating Committee, and the main Committee suspended its activities until the various sub-committees should have reported. In February, 1918, the main Committee was dissolved. As Mr. Layton pointed out, "If it waits until all the new programmes are finally settled, it will never meet again until the end of the war. Meanwhile its functions are being performed by the Clamping (*i.e.*, Co-ordinating) Committee." The Co-ordinating Committee in fact became a Standing Committee, under the chairmanship first of Sir Arthur Duckham and afterwards of Mr. Layton. Its sphere of activity extended beyond a strict interpretation of the 1918 programme, and it gradually assumed some of the functions originally intended for the Munitions Council itself. The membership of the Committee therefore became flexible, and in addition to the permanent nucleus other Members of Council and officers of the Ministry attended according to the nature of the business to be discussed. This Committee proved a permanent institution and its activities continued throughout the remaining period of the Ministry's existence. It thus came to perform much of the work which theoretically belonged to the Council itself.

The only other standing Committees were that on Demobilisation and Reconstruction, which prepared the ground for the Demobilisation Board established at the time of the Armistice, and that on Publicity. A general principle of Mr. Churchill's organisation was to avoid the multiplication of Standing Committees, which, as Sir Graham Greene pointed out in a minute to the Minister of 3 January, 1918, "would have the effect of reducing the responsibility of Members of Council." The excessive numbers of such Committees had been considered one of the weaknesses of the preceding régime.

With regard to the reports of the Council Committees, on 11 December, 1917, Mr. Churchill said: "Speaking for myself, I practically always approve a Council Committee report exactly as it comes. I think I have hardly ever altered a word, and I read each report through with great attention, and see the decision on the question which I know is ever so much better than I could have produced myself if I had studied the question for two whole days; and it would be quite impossible for me to do that."

These Committees also served another purpose. On the same occasion Mr. Churchill said: "I am very anxious indeed that the Council Members should take a general interest in the whole business of the Ministry of Munitions and not feel themselves confined to a particular group. This is secured by the numbers of Council Committees which are formed among the Members of Council and which, in fact, are

always arranged so as to spread knowledge of what I may call the general business of the Ministry widely over the whole body of Council Members."

(*f*) Conclusion.

The new organisation was now complete. Both formally and in practice it represented a considerable step in the direction of conformity with normal Civil Service standards, and may be regarded as the victory of this principle over the rival method of autonomous business man control. This, however, does not imply that the victory of the principle which Sir H. Llewellyn Smith had originally advocated meant the defeat of the cause which Sir Percy Girouard had championed. Rather did the new organisation provide a solution for the antagonism between these rival conceptions. Though based on a reorganised and strengthened Secretariat of Civil Servants, it still offered the fullest scope for the initiative and executive authority of the great business heads of departments. It was no longer true, as had been stated by Sir Laming Worthington Evans when Mr. Churchill took office, that "in the Ministry there are no positions held by Civil Servants comparable with the permanent chiefs in other Departments of State"; and, though the position of the business man as Member of Council or as head of department continued to be the outstanding characteristic of the Ministry, yet the unity of the administrative whole was now formally cemented by the existence of an important central organisation run on Civil Service lines. This was further ensured by the work of the Secretarial Officers, the co-ordinating links in the administrative chain, who were themselves, with only two exceptions, permanent Civil Servants. The history of the Ministry is indeed the history of an emergency "business" institution which, in order to maintain business efficiency in circumstances of growing complexity, fell back more and more on the traditional Civil Service type of organisation.

CHAPTER VII.

THE POWERS AND RESPONSIBILITIES OF THE MINISTER OF MUNITIONS.

I. Introduction.

The legal basis of the vast powers wielded by the Ministry of Munitions are some half a dozen Acts of Parliament and a network of regulations made by Order in Council under the Defence of the Realm Act. Of the Acts of Parliament the following are the most important :—

The Ministry of Munitions Act, 1915 ;[1]
The Munitions of War Act, 1915 ;
The Munitions of War (Amendment) Act, 1916 ;
The Munitions of War Act, 1917 ;
The Defence of the Realm Consolidation Act, 1914 ;[2]
The Defence of the Realm (Amendment) No. 2 Act, 1915 ;[3]
The Defence of the Realm (Amendment) No. 3 Act, 1915 ;[4]
The Defence of the Realm (Acquisition of Land) Act, 1916 ;[5]
The Billeting of Civilians Act, 1917 ;
Patents and Designs (Partial Suspension) Act, 1915 ;
The Munitions (Liability for Explosions) Act, 1916.

In this hurried emergency legislation Parliament confined itself in the main to laying down general principles, leaving the details to be worked out by Orders in Council promulgated on the advice of the Minister. Thus the bulk of the legal war-time code was embodied in regulations made by executive departments. This system, though perhaps inevitable at the time, did not prove satisfactory in practice. The power of emergency legislation was dangerous and subject to abuse ; a suspicion of *ultra vires* hung over every regulation ; several were attacked on this ground, and two important ones at least (2.A2, restrictions on ejectment of munitions workers, and 2B, assessment of compensation for requisitioned goods) have been declared invalid by the High Court. The experience of the Ministry of Munitions has shown the advantage of embodying in the Defence of the Realm Act, in any future emergency, any necessary restrictions on the liberty of the subject, so that they may have undeniable statutory validity.

The legislative powers thus exercised by the department on a scale hitherto unprecedented touched the industrial life of the country at a multitude of points. The main object of this legislation was to reorganise the industrial resources of the country for the production of

[1] See Appendix XIV. [2] See Appendix XI. [3] See Appendix XII.
[4] See Appendix XIII. [5] See Appendix XVI.

munitions of war, and as a result the interests of individual traders were definitely subordinated to the interests of the State, while employers and employed had to submit to the unwelcome discipline of the unpopular Defence of the Realm Act.

Of these wide powers, which will be considered in more detail below, some, which had already been exercised by the Admiralty and the War Office under the Defence Acts and the Defence of the Realm Acts of 1914, passed to the Ministry of Munitions under the Ministry of Munitions Act and Ministry of Munitions Order, which gave it concurrent powers with the War Department and the Admiralty, while others were conferred upon the Ministry by the special legislation already referred to.

Thus the Ministry acquired rights over land, over raw materials and manufactured goods, over factories, workshops and machinery. It regulated employers and their profits, labourers and their wages.

With regard to land, for instance, the Ministry, by arrangement with the War Office and through the competent military authority, caused wide use to be made of the powers conferred on the War Office of taking possession of the land required for the sites of factories, but later, in order not to lose the money that had been spent in erecting factories on these temporary sites, it obtained power to continue occupation after the war, or to acquire in perpetuity even from owners who were unwilling to part with their property.[1] The tenure of land by the Ministry was in many respects abnormal. It closed high roads and carried railways over public thoroughfares, it laid water and drainage pipes and power cables over and under private land, it emancipated itself from Home Office regulations and local bye-laws, polluting the air with the fumes and rivers with the effluents from its factories.

The Ministry's powers over the raw materials of the munitions industry included the control of buying and selling, the elimination of speculative dealings, the control of stocks and output, the fixing of prices, and a measure of control, exercised indirectly through the Board of Trade, over export and import. By the issue of regulations under the Defence of the Realm Act the Ministry built up an elaborate priority system which was designed to give war activities precedence over all non-essential industries, the latter being strictly rationed with machinery, labour, and materials. With the same object in view, the building trade was restricted, economy in the use of heat, light and power was enforced, while the holding of trade exhibitions was prohibited. The powers of the Ministry extended even to the manufacturing methods of non-munition industries, as in the case of the gas companies, whose processes were varied by direction of the Ministry, in order to obtain the maximum amount of munitions materials, legal power being taken to indemnify them against claims for breach of contract.

[1] See below, pp. 198–201, for a summary of the provisions of the Defence of the Realm (Acquisition of Land) Act.

The Ministry's powers over employers included the control of profits, the right to demand returns of all kinds, to examine books and costs, and even to have the details of secret processes revealed.[1]

Its powers over labour included the regulation of supply by badging, by the machinery of leaving certificates, and by enforcing dilution, while it made general regulations as to wages. Other legislation forbade strikes and set up special tribunals to deal with munitions offences, while regulations under the Defence of the Realm Act gave the Ministry power to proceed against strikers for impeding the output of munitions and to deport their leaders.[2]

Certain Home Office regulations which were prejudicial to output were suspended, but in order to maintain the health and efficiency of munition workers the Ministry drew up health rules and safety rules for explosives factories and made regulations as to the sale and consumption of intoxicants in munitions areas, while housing schemes and welfare schemes were undertaken under the general powers conferred upon the Ministry by the Munitions Acts.

Among the miscellaneous responsibilities that fell upon the Ministry were the duties of assisting to maintain the censorship, of securing factories against espionage and sabotage, and of maintaining the quality of war material by punishing carelessness or fraud in manufacture. The risk of explosion and accident in connection with the manufacture of munitions had before the war been borne directly by the manufacturer, but indirectly by the State as purchaser, the cost of the manufacturer's insurance being provided for in the price of the store. This system was continued for a time ; later the State undertook to indemnify contractors, upon whom a levy was made, and insurance against risk was eliminated from contract prices.

The powers thus outlined will be considered in more detail in the following pages.

II. The Ministry of Munitions Act and the Order in Council of June, 1915.

(*a*) The Ministry of Munitions Act.

The powers and responsibilities of the Ministry of Munitions were defined by the Ministry of Munitions Act[3] (9 June, 1915) and elaborated by the Order in Council issued on 16 June and known as the Ministry of Munitions Order.

The new Ministry was created, it is stated, "for the purpose of supplying munitions for the present war," and the clause defining the Minister's powers was drawn in the widest possible terms. The clause as originally drafted was as follows :—

> 2. (1) The Minister of Munitions shall have such powers and duties in relation to the supply of munitions for the present war

[1] See below, pp. 224–225.
[2] See below, p. 230.
[3] See Appendix XIV.

> as may be conferred upon him by His Majesty in Council, and His Majesty may also, if he considers it expedient that, in connection with the supply of munitions, any powers or duties of a Government Department or Authority, whether conferred by statute or otherwise, should be transferred to, or exercised or performed concurrently by, the Minister of Munitions, by Order in Council make the necessary provision for the purpose, and any Order made in pursuance of this section may include any supplemental provisions which appear necessary for the purpose of giving full effect to the Order.

It was expressly stated that the Ministry would " concern itself . . . . with industrial co-ordination over a much wider field than the field of production which is itself appropriate,"[1] and that it would be necessary for the industry of the country generally to be under the survey of the department in order that the production of munitions might effectively be promoted. It was further to be the duty of the Minister to " keep in touch with all labour questions arising in regard to all classes of munitions, and, it may be, other matters."[2] In fact no limits as to the powers of the Minister were laid down save that they were required to be in relation to the supply of munitions for the war, and that they were to be such as might be conferred on him by Order in Council.

In the course of the debate on the second reading of the Bill, considerable anxiety was expressed as to the nature of the powers to be conferred upon the Minister. It was felt that, as the clause stood, the Minister would be vested with a dictatorship which would enable him to introduce some form of compulsory labour, and Mr. Lloyd George's recent speech at Manchester gave some foundation for these fears. The fears thus expressed were allayed by Sir John Simon's declaration on behalf of the Government, that there was not " the remotest intention of using the Bill for any such purpose,"[3] and Clause 2 (1) was amended by the insertion of the word " administrative " so as to read :—

> " The Minister of Munitions shall have such administrative powers and duties in relation to the supply of munitions," etc. etc.

On the second reading (7 June) Sir John Simon stated that it was the intention to insert in the Bill " a definition of munitions which will secure that the word is used in its widest possible sense,"[4] and the definition finally embodied in the Act was as follows :—

> 7. In this Act the expression " munitions of war " and the expression " munitions " mean anything required to be provided for war purposes, and include arms, ammunition,

---

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII, 90.
[2] *Ibid.*, 91. [3] *Ibid.*, 115. [4] *Ibid.*, 89.

war-like stores or material, and anything required for equipment or transport purposes or for or in connection with the production of munitions.[1]

Clause 6 of the Act provided that the Ministry of Munitions was to be a temporary department. The office was to cease to exist at the end of a period of twelve months after the conclusion of the war, when the powers transferred from other departments were to be re-transferred to them.

(*b*) The Ministry of Munitions Order, 1915.

The Order in Council of 16 June[2] defined the Minister's responsibilities more exactly without limiting them in any way. Clause 1 runs as follows :—

> " It shall be the duty of the Minister of Munitions to examine into and organise the sources of supply and the labour available for the supply of any kind of munitions of war, the supply of which is in whole or in part undertaken by him, and by that means, as far as possible, to ensure such supply of munitions for the present war as may be required by the Army Council or the Admiralty or may otherwise be found necessary."

It may be noticed that the Minister was empowered to provide munitions for the Admiralty as well as the War Office, but with the important exceptions of steel, explosives and propellant, and with some minor exceptions, the Admiralty retained responsibility for the supply of its own munitions throughout the war.

The clause gave no direct power with regard to labour and may be regarded mainly as defining the extent of the Minister's functions. It must, however, be noticed that Section 1 (3) of the Defence of the Realm Consolidation Act, 1914, as amended by the Defence of the Realm (Amendment) No. 2 Act, 1915, and Regulation 8A of the Defence of the Realm (Consolidation) Regulations, 1914, which are among the enactments and regulations referred to in the schedule annexed to the Order, would have enabled the Minister, by imposing restrictions on a factory or by the removal of plant, to exercise an indirect control over labour, though such control would necessarily have been negative in its effect. In view of the fact that at the time of the Order in Council the Munitions of War Act, 1915, was already in process of drafting and was destined in a short time to take its place in the Statute Book, the question of what powers, if any, were exercised with regard to labour under the Order and Regulations referred to can only be of academic interest.

---

[1] For the purpose of the Defence of the Realm Regulations an equally wide definition of " war material " was laid down, viz., " The expression war material includes arms, ammunition, warlike stores and equipment, and everything required for or in connection with the production thereof." D.R. Regulations, 62, para. 3.

[2] See Appendix XV.

More important was the power conferred on the Minister of Munitions by the words in which his duty was in part defined as being to "examine into and organise the sources of supply . . . . . of any kinds of munitions of war," for it is by virtue of this that the Ministry was enabled to carry on its work as a supply department and to set up new national factories. The carrying on of work at existing factories (Woolwich, Enfield, and Waltham) was covered by Section (*b*) (i) of Clause 2, which provided for their transfer to the Ministry by agreement with the Army Council, while Section (*b*) (ii) of the same Clause authorised the transfer to the Ministry of Munitions of such functions "in relation to work carried on at any other Government establishment used for the purpose of the manufacture or supply of munitions of war as may be agreed upon between the Minister of Munitions and the department or authority having control of such establishment." It will, however, be observed that this section did not give power to bring such establishments into existence and only applied to such as had already been set up, and the legal basis of the numerous national factories subsequently set up is to be found in Clause 1.

As the Ministry of Munitions was primarily formed to take over certain functions then exercised by the War Office, Clause 2 of the Order in Council provided for the transfer to the new department, by agreement with the War Office, of the functions of the department of the Master-General of Ordnance in relation to contracts, the supply of explosives and the inspection of munitions.

In accordance with this Order, therefore, there were transferred at the outset to the Ministry of Munitions :—

(1) The Contracts and Labour Branches of the Master-General of Ordnance's Department.
(2) The Royal Ordnance Factories.
(3) The High Explosives Department.
(4) The functions of the Armaments Output Committee.
(5) The Chief Inspector at Woolwich and the Chief Inspector of Small Arms and their staff so far as engaged on inspection.

Clause 2 of the Order in Council provided for the future and arranged for the transfer to the Minister of Munitions of any other work of the Secretary of State for War, of the Army Council, Admiralty or of any other Government Department or Authority as might be expedient. Under the terms of this provision the responsibility for trench warfare supplies, and for metals, machinery, electrical stores, horse-drawn vehicles and pedal bicycles, was subsequently transferred to the Ministry from the War Office. After considerable correspondence between the two departments mechanical transport was finally transferred to the Ministry at the end of 1916, and at about the same time the supply of railway materials was also undertaken by the Ministry, while responsibility for the supply of aircraft and aero-engines was undertaken in 1917.

The extent of the Ministry's control over the Ordnance Factories was to be settled by agreement between the Ministry and the War Office. It was originally arranged that the administration of these factories should not immediately pass to the new department, but that the whole technical resources and experience of the staff of the factories should be made fully and directly available to aid the development of the supply of munitions, not only within but outside the factories. It was found, however, after a comparatively short trial that this arrangement was unworkable in practice, and accordingly in August, 1915, the whole responsibility for the control of orders, policy and management, together with the necessary financial control and accounting, was transferred to the Ministry of Munitions for the period of the war.

By Clause 3 of the Order in Council the Minister was given concurrent powers with the Admiralty and Army Council in various enactments and regulations mentioned in the schedule annexed to the Order, to enable him to carry out the duties which had been assigned to him. He thus obtained power to make regulations as to the defence of the realm (Section 1 (1) and Section 1 (3) of the Defence of the Realm Consolidation Act, 1914, as amended by the Defence of the Realm (Amendment) No. 2 Act, 1915); to interfere with contracts (Section 1 (2) of the Defence of the Realm (Amendment) No. 2 Act, 1915); to requisition the output of factories manufacturing arms, ammunition or any warlike stores or equipment or any articles required for the production thereof (Regulation 7 under the Defence of the Realm Act); to take possession of any factory or workshop, or of any plant belonging thereto, and to use them for naval or military service (Regulation 8 under the Defence of the Realm Act); to direct or restrict work in any factory and to remove plant (Regulation 8 A)[1]; to close licensed premises (Regulation 10); to provide for the trial of offences (Regulation 56); and, finally, to take unoccupied premises for the housing of workmen under Regulation 1 of the Order in Council of 23 March, 1915, amending the Defence of the Realm (Consolidation) Regulations, 1914, which Order was issued after the passing of the Defence of the Realm (Amendment) No. 2 Act.

III. Powers relating to the Control and Purchase of Land.

During the first year of the war the Admiralty and the War Office took over a large amount of land for camps, ranges, training grounds, aerodromes, coast defence works, stores, etc., under the provisions of the Defence of the Realm Act. Public and private parks and common lands were taken over, workhouses and other buildings were requisitioned, highways were stopped up, and railways were carried across high roads by level crossings. In a few cases time was found to regularise the position by a legal agreement defining the terms of Admiralty or War Office tenancy, but in the vast majority of cases the departments merely occupied the land for military purposes under the Defence of the Realm Act, and the rights of the owners, remaining in suspense, would be revived at the end of the war.

[1] Under this Regulation, which was amended by the Munitions of War Act, 1915, the system of priority in manufacture was developed.

Under the Defence of the Realm Acts, the view taken originally was that no one had any right or claim against the Government in respect of the requisitioning of this property, but, as an act of grace, a Defence of the Realm Losses Commission was appointed to investigate cases of hardship, and recommend grants by the Government to meet special cases.[1]

At the date of the formation of the Ministry the Defence of the Realm Act had not been invoked in connection with the sites of any of the National Shell Factories, which involved no difficult questions of ownership, the Ministry being tenant only.

The decision to build a number of National Projectile Factories altered the whole character of the situation and made the ultimate ownership of the land on which these factories were built a question of the utmost practical importance. Mr. Lloyd George had decided that, in view of the heavy expenditure incurred by the Government, the land on which the factories were to be built should be bought outright or taken on a long lease.[2]

The Order in Council of 16 June, 1915, had given the Ministry concurrent rights with the Admiralty and War Office in taking possession of factories and buildings under the Defence of the Realm Act, but it appeared that the Minister of Munitions had no legal power to hold land in his official capacity and that an Act of Parliament or Order in Council would be required to enable him to do so.[3]

In the opinion of Sir Arthur Thring (Parliamentary Counsel), as the Ministry of Munitions was only intended to be a temporary department it was inadvisable to give it power to acquire land. Land could be acquired for the purposes of the Ministry through the Lands Branch of the War Office and vested in the Secretary of State. Even if the Ministry were given the power to acquire land, it would probably be necessary for the department to avail itself of the staff and experience of the Lands Branch.[4] The suggestion that the Ministry should be given the power of acquiring land was therefore abandoned. It was at first arranged that the land bought or leased for the Ministry of Munitions' factories should be vested in the Treasury Solicitor,[5] but this was modified later (27 October), when it was decided that in all cases in which the land was intended to be devoted permanently to military purposes it should be conveyed to the Secretary of State for War. In other cases the land was conveyed to the Office of Works, especially where the land was leasehold, in which case the necessary covenant was entered into by the Office of Works.[6] Possession and control of the land conveyed to either the Secretary of State or to the Office of Works was given to the Ministry of Munitions by a formal

[1] *Parliamentary Debates* (1916), *H. of C.*, LXXXIV, 739.
[2] 5 August, 1915. 94/Gen. Nos./198, 94/Gen. Nos./234.
[3] 94/Gen. Nos./198.
[4] 29 July, 1915. M.W./9,275.
[5] 94/Gen. Nos./234.
[6] Office Memo. No. 18. 27 October, 1915. 94/Gen./198.

departmental minute. The Treasury Solicitor, acting under the Minister's directions, appeared as his nominee in certain cases where the Minister took either a mortgage on land or debentures charged on land or other property. In practice, this procedure was found to be inconvenient and was only occasionally adhered to. Leases and interests in land were frequently conveyed to the Minister, and even in the latter case to individual officers of the Ministry, as it was found impossible in cases of great urgency to risk the delay which would have inevitably occurred if the more elaborate procedure had been adopted.

The Lands Branch, which subsequently, under Sir Howard Frank, became the Lands Department, acted as the adviser of both the War Office and the Ministry on all estate questions from February, 1916, onwards.[1] In addition to the 250,000 acres which were the permanent property of the War Department at the outbreak of war, about 200,000 acres were acquired, either permanently or temporarily, for one or other of the departments for war purposes.[2] All negotiations and arbitrations for the purchase of land, both for the War Office and the Ministry, were controlled by the Lands Department, and all requisitioning of land under the Defence of the Realm Act was carried out by it through the officers of the military command in whose area the property was situated.[3]

In every case, except one, definite agreements were reached as to the sites of the Projectile Factories, the Ministry being either owner, lessee for 21 years, or tenant for the duration of the war, either with or without an option of continuing its tenancy.[4]

But Cathcart stood in a class by itself. There the owner of the site had given an undertaking to the feuars of neighbouring property that no industrial buildings would be permitted on the ground. The land required, therefore, had to be taken under the Defence of the Realm Act, and the termination of the war would bring with it the obligation to surrender the site, with the buildings, to the original owner. The same difficulty had to be faced in connection with many other national factories, since a large proportion of the sites for filling factories, for explosive and propellant, and trench warfare factories, etc., had been taken over under the Defence of the Realm Act.[5]

It became clear that something must be done to regularise the position and give the Ministry compulsory powers of acquiring the sites of the factories on which so much public money had been spent,

---

[1] For an account of the earlier procedure see HIST. REC./H./1122/1.

[2] Memorandum submitted to Select Committee on National Expenditure by Sir Howard Frank. (HIST. REC./R/263.9/1.)

[3] *E.g.*, 4 May, 1916. 94/Nat./140.

[4] The Defence of the Realm Act had to be invoked, however, in order to make full use of the sites, *e.g.*, at Birtley public roads had been closed and at Templeborough a railway carried across a high road.

[5] *e.g.*, Cardonald, Pembrey, Southampton, Birmingham, Worcester, Edmonton. 94/Filling/37. 94/Nat./140,141. 94/Nat./119. 94/Nat./152. 94/Nat./153. Of the 21 filling factories there were only four the sites of which were not taken under the Defence of the Realm Act.

in order that the ownership of these factories should not pass, when the war came to an end, to the owners of the land on which they had been built. The Admiralty and the War Office were in a similar position, though they had not, of course, built permanent buildings on requisitioned land to quite the same extent as the Ministry.

Again, in many cases the working of the newly erected factories necessitated encroachments on neighbouring land, interference with lights, the carriage of pipes, electric cables or sewers over or under adjoining land and the like. In a few cases time was found to draw up short agreements acknowledging the easement or encroachment by payment of a nominal sum and undertaking to withdraw it " when no longer required by the exigencies of the public service in connection with the war," making good any damage to property.[1] In most cases, however, there was no time for this, and the powers necessary for utilising the property for war purposes were taken under the Defence of the Realm Act. Moreover, in a large number of cases the working of the newly erected munition factories entailed pollution of rivers, the abstraction or diversion of water, or the emission of smoke and noxious fumes in contravention of restrictive covenants, local bye-laws or Acts of Parliament. The fact that the property had been taken under the Defence of the Realm Act threw a shield over these proceedings as long as the war lasted, but it was anticipated that the termination of the war would withdraw this shield and make it impossible to work the factories. The Defence of the Realm (Acquisition of Land) Bill was therefore introduced on 1 June, 1916. The general object of the Bill may be stated in the words used by Dr. Addison on the second reading on 5 July.[2]

> " The House is well aware that large sums of public money have been spent by the Admiralty, by the War Office, and the Ministry of Munitions in building huts, sheds, factories and storehouses, and in many other forms, on land for purposes connected with the war. Commonly this work had to be proceeded with rapidly, and under emergency conditions. There was no time to investigate separate questions of title, or questions of the purchase price. These things we have had to leave to deal with afterwards. . . . The general object of the Bill is to place the State, as far as possible, in a secure position in respect of the expenditure which it has incurred in this work, and to safeguard it against unreasonable and avoidable loss. Millions of money have been spent by the departments upon the land which they have taken under the Defence of the Realm Act, or by virtue of the royal prerogative, and it is obviously necessary in the national interest that there should be power to acquire this land . . . . It is right to guard ourselves against the contingency which might arise at the end of the war, when the Defence of the Realm Acts have lapsed,

[1] *e.g.*, the agreement with the G.W.R., permitting overhead cables to be carried across their property at Banbury, 3 March, 1916.

[2] *Parliamentary Debates* (1916), *H. of C.*, LXXXIII, 1,555–1,562.

> that these buildings and this plant which have been provided at so great a cost, shall be forfeited to the owner of the site . . .
>
> It is clear that we should aim, as far as possible, at securing that all this provision of well-equipped establishments, with up-to-date plant and modern and beautiful machinery—arranged in the main according to the advice of the first experts in factory construction and management—should be treated in such a way as to add as much as possible to the enrichment of the manufacturing resources of the country."

The Bill, which was very complicated and appeared to deal harshly with private rights, was subjected to some searching criticism. Defended by some members as being " a most courageous measure of State socialism," it was condemned by others as being " rushed forward by an enthusiastic bureaucrat intoxicated with the exercise of long-continued emergency powers." The House was suspicious and alarmed. In spite of the Solicitor-General's tactful speeches about reconciling public necessity and private interests, members sitting in all parts of the House argued that the Government Departments were asking for enormous and tyrannical powers under the Bill[1]—powers which the House had never yielded before, and which it was not desirable that it should yield.

In order to carry the Bill, very considerable concessions to both public authorities and private owners were made in Committee.[2]

Before summarising the very wide powers obtained by the Ministry and other Government Departments under the Act,[3] it is desirable to indicate its limitations. The Act in its final form did not affect land held by the Ministry under the terms of any agreement.[4] Sections (3) and (4) of clause 13 clearly laid it down that, where possession of land had been taken under any agreement, the Act did not authorise retention of possession beyond the period named in the agreement, and that nothing in the Act should authorise compulsory acquisition of land which had been taken subject to an agreement that it should be restored to its former owner or occupier.[5]

As Dr. Addison said on 21 August, " We have no desire that this Bill should override any of our agreements. They will, of course,

---

[1] *e.g.*, Mr. J. M. Henderson, *Parliamentary Debates* (1916), *H. of C.*, LXXXIII, 1,587.

[2] *e.g.*, the veto on the acquisition of common lands, the subsection giving the former owner a right of pre-emption, the clause excluding land taken under agreement, and the machinery for referring disputes to arbitration.

[3] See copy of the Act in Appendix XVI.

[4] This safeguard was due to an amendment inserted during the passage of the Bill through the House. *Parliamentary Debates* (1916), *H. of C.*, LXXXIII, 1,574.

[5] There was one minor exception to this which enabled the Government Departments to continue possession of and if necessary acquire land they went into under a six months' or other short tenancy agreement (Clause 13 (3) and (4)). See explanation by the Solicitor-General, *Parliamentary Debates* (1916), *H. of C.*, LXXXV, 2,414–5.

be honourably abided by "—and the Solicitor-General repeated the pledge on 25 October: "The Government desires in every respect to adhere to its agreements."

The Act therefore left the terms of agreements untouched, and the Ministry remained bound by various agreements to restore sites or part of sites at the end of the war, to take up the railway laid in a public street in Glasgow and restore the street to its former condition, and so on.

The powers obtained under the Act may be summarised under four headings:—

(1) Power to continue possession of land occupied for the purpose of the defence of the realm.
(2) Power to remove buildings or other works.
(3) Power to acquire land permanently.
(4) Power to sell land acquired under the Act.

(1) *Power to continue possession of land.*—Clause 1 enabled a Government Department to remain in possession of land occupied during the war for the defence of the realm for two years after the end of the war, and, if the Railway and Canal Commission considered it necessary in the national interest, possession might be continued for a further period not exceeding three years. Rent or compensation was to be paid for continued possession of the property on terms to be settled, failing agreement, by the Railway and Canal Commission.

The Government was authorised to continue after the war the powers that were exercisable during the war, but if the continued occupation of the property caused "pollution, abstraction, or diversion of water or the emission of noxious fumes" neighbouring landowners who would have been entitled in normal times to an injunction were to be compensated. Land belonging to any local authority, to any railway, canal, dock or similar undertaking, or to any university, college, or charitable body, could only be retained for three months after the end of the war, unless the consent of the governing body was first obtained. Even when this consent was obtained, the Government could not remain in possession for more than three years after the end of the war.

(2) *Power to remove buildings and other works.*—Clause 2 gave the occupying department the right to remove any building or other work constructed wholly or partly at the expense of the State on occupied land for purposes connected with the war.

The consent of the owner of the land was not required for this removal, but this power of removal did not apply in cases where the building was erected partly at the expense of a person interested in the land, or where the Government had erected or contributed towards the erection of the buildings under an agreement with the occupier entitling him to the benefit of the building or work. In such cases his consent was necessary before removal was possible.

In every case where removal took place the Government was bound to restore the land to its previous condition, or if those concerned

agreed, or the Commission assented, to pay compensation for the disturbance.

There were special provisions as to the removal of buildings on common lands.[1]

(3) *Power to acquire land permanently.*—Clause 3, which contained the third and principal object of the Bill, empowered the Government to purchase outright, with or without the minerals, any land in the possession of the Government, or any land on which they had erected any buildings or works in connection with the war, paying the owners the value the land had before the factories or works were erected.

In order to minimise as far as possible the obvious disadvantages from the point of view of the landlord of uncertainty as to whether or not the land was ultimately to be acquired by the State, the Government Departments were bound, in the case of land of which they were in possession, to decide within three years of the termination of the war whether or not they were going to purchase it.

In the case of land of which the Government were not in possession, but on which they had erected buildings or works, the decision must be made within one year of the termination of the war. In certain cases Government Departments were precluded from buying the land at all—as for instance, where any agreement existed for the restoration of the land to the person previously in occupation, or where the land was common land.

Clause 13, Section 1 of the Act forbade the acquisition of common lands, even with the consent of the commoners.

There was a general feeling that the public had shown the greatest willingness to have common lands used for war purposes, and that it would be unfair to take advantage of a spirit of that kind by perpetuating encroachments on common lands.[2] In the same way land which formed part of a park, garden, pleasure ground, or home farm, or land which was the site of any object of archæological interest, could only be acquired by agreement with the owner. To this there was one exception. Subsection (*a*) empowered the departments to acquire compulsorily property of this nature on which any buildings for the manufacture of munitions of war had been erected before the passing of the Act, if the Railway and Canal Commission were satisfied that it was of national importance that the property should be acquired. This subsection was introduced to meet two special cases, a large filling factory on which £1,000,000 had been spent, and a factory for casting brass and rolling brass strip for small arms ammunition, both of which had been built on private park land.[3] The owner was given the right of requiring the whole of the property, including the mansion

[1] Clause 3., Section (3). See below, p. 200.

[2] The Solicitor-General, *Parliamentary Debates* (1916), *H. of C.*, LXXXIII, 1,590.

[3] Dr. Addison, *Parliamentary Debates* (1916), *H. of C.*, LXXXVI, 1,229.

house, to be purchased. When any buildings or works had been constructed on common land, they were to be removed and the land restored to its former condition, unless the Board of Agriculture declared that such removal or restoration was not required.

This provision was inserted in order to meet cases where roads or other improvements had been made which it might be in the general interest to retain, but in order to prevent local interests or prejudices from being over-ridden, local authorities were to be given an opportunity of being heard. Many members had feared that local authorities might prefer some brand new road across a heath to their former privilege of "gathering bracken undisturbed by improvements," and a provision was therefore made that an address by either House of Parliament would fetter the powers of the Board of Agriculture to authorise the retention of improvements.

In certain cases this power of acquiring the actual site of buildings would not be of any great value without the right of access or possibly without the right to acquire a certain amount of adjoining land. In the case of an air-station, for instance, the utility of the place would be destroyed if factories or chimneys were to be built round it. The Act therefore gave the Government the power of acquiring such land, right of access or other easements or rights as appeared to the Railway and Canal Commission to be required for the proper enjoyment of the land. This clause was hotly disputed during its passage through the House, being condemned as "more than ordinarily monstrous."

The section that followed was of great importance. It provided that if the land was to be used for any purpose not covered by the Defence Acts or the Military Lands Acts, the right of compulsory acquisition could not be exercised without the consent of the Commission. The exact meaning of this proviso, and its bearing on the right of the Ministry compulsorily to acquire land used for housing schemes and other schemes not directly connected with defence was not quite clear, and counsel's opinion was taken on the point later on.

Another clause of the Act (Clause 4) defined the way in which the land compulsorily acquired might be used, drawing the same distinction between land used for defence purposes and other land. In the former case much more latitude was allowed. Thus if the property was used for purposes for which it could have been used under the Defence or Military Lands Acts, the only compensation payable for damage caused by the pollution, abstraction or diversion of water or the emission of noxious fumes was for breach of a restrictive covenant. If it was used for other purposes, compensation was payable both for breach of a restrictive covenant and for nuisance, but the factory could not be compelled to shut down by reason of its creating a nuisance. If compensation was payable, the Government reserved to itself the right of buying out the complainant. In order to prevent the pollution of rivers and so on being continued indefinitely to an unreasonable extent, the Act provided that the provisions of

the Alkali, etc., Works Regulation Act (1906), of the Rivers Pollution Prevention Acts, and of local regulations and bye-laws must be observed.[1]

(4) *Power to sell land acquired under the Act.*—As it was probable that in a large number of cases the Government would not require to retain permanently the sites acquired under the Act, power was reserved to sell or lease it, giving in the case of a sale or of lease for more than 21 years,[2] a right of pre-emption to the former owner and failing him to the owners of adjoining land.

The original owner, however, had no right of pre-emption when buildings of a permanent nature had been erected on his land wholly or partly at the expense of the State, or at the request of or by arrangement with any Government Department. The expression "buildings of a permanent nature," as defined by the Solicitor-General, excluded huts or iron buildings,[3] but even so the original owner was denied the right of pre-emption in a very large number of cases.

The Act also contained provisions as to highways.

As has been seen, there were many cases in which light railways or tramways, cables or pipes had been laid along or across public highways in order to serve camps or munition factories. As the value of the camps and factories would be much impaired without these facilities, the Departments were empowered to continue them subject to such conditions as in certain cases the Board of Trade, and in others the Commission, might impose after full opportunity of being heard had been given to local authorities. If these tramways, light railways or pipes were discontinued, the roads had to be restored to the satisfaction of those responsible for their maintenance.

No level crossings of highways by railways or tramways were to be continued after the expiration of two years from the end of the war without the consent of the local authority. If any highway had been closed, it might be kept closed for twelve months after the termination of the war, or, with the consent of the Commission, for a longer period, subject to certain conditions such as the provision of another highway. Any person interested in land adjoining the highway was entitled to compensation.

Under Clause 7 of the Act, companies and authorities supplying water, light, heat or power at the request of a Government Department to factories or camps outside their legal area were bound to continue the supply for twelve months after the end of the war, or, with the consent of the Commission, for a longer period, subject to certain conditions.

---

[1] *Parliamentary Debates* (1916), *H. of C.*, LXXXVI, 1,184.

[2] This last proviso was inserted as a Lords' amendment. *Parliamentary Debates* (1916), *H. of L.*, XXIII, 662; *H. of C.*, LXVIII, 1,689. It was designed to prevent Government Departments defeating the owner's right of pre-emption by granting leases for 99 or 999 years. *Parliamentary Debates* (1916) *H. of C.*, LXXXVI, 1,206–8.

[3] *Parliamentary Debates* (1916), *H. of C.*, LXXXVI, 1,212.

The debates in the House had showed that there was much hostility to what was described as " the perpetuation of illegalities." It was feared that, if companies or municipalities were forced to go on supplying large factories outside their area of supply, there might be grave inconvenience to consumers within their area, and provisions were introduced to safeguard the interests both of the companies and of the consumers. The case of Lancaster National Projectile Factory, the whole of which was supplied with power and light by the Lancaster authority, though part of it lay within the Morecambe district, however, was quoted by Dr. Addison to show that it was necessary for some such compulsory powers to exist.

The ultimate authority in all questions as to the purchase price of land and all questions of compensation was the Railway and Canal Commission, which consisted of three judges and two appointed members, the three judges representing England, Scotland and Ireland. If either of those countries was concerned in a case, a judge representing that country sat on the commission, and the two appointed members sat with him.

There was a strong impression in many quarters that the Commission would be an unsuitable body to determine questions of land valuation, for which it had no special experience or aptitude, and amendments introduced during the passage of the Bill through the House authorised the Commission to appoint specially qualified persons as assessors to assist them in hearing cases, and to hold local enquiries. Another concession to pressure in the House gave the parties the right by mutual agreement of referring their case to a single arbitrator instead of taking it before the Commission. Failing agreement, either of the parties might refer it to a member of a panel of referees appointed by machinery set up under the Finance Act of 1910.

An important decision of the Railway and Canal Commission, under the Defence of the Realm (Acquisition of Land) Act, was given in the case of the Minister of Munitions *v.* Chamberlayne (25 March, 1918).[1]

During the enlargement of a factory for rolling cartridge strip, built on land acquired by agreement, possession was taken under the Defence of the Realm Act of adjacent property, which formed part of a neighbouring estate. As the owner refused to sell at a reasonable price the Minister applied to the Railway and Canal Commission, under Section 13 (1) (*b*) of the Act, for an order enabling him to acquire compulsorily the mansion house and a large part of the park, including the site of a new road and of the water supply and of a strip of land leading to the water supply.

Three points arose for decision: (1) whether, at the time of the passing of the Act, a factory had been erected; (2) whether the section of the Act gave authority to acquire the mansion house; and (3) whether the acquisition was a matter of national importance. On

[1] C.R.V./Gen./2,067.

each of these points a decision was given in favour of the Minister,[1] which decision was upheld on appeal. Mr. Chamberlayne then exercised his rights under Section 13 (1) (*b*) of the Act and required the Government to purchase the whole of the property including the mansion house.

As has been seen, the Act allowed Government Departments a considerable period of grace after the termination of the war in which to decide how many of the properties they occupied they wished permanently to acquire. There were strong practical arguments against taking action too soon, owing to the uncertainty as to the duration of the war, the difficulty of forecasting post-war requirements, and so on.[2] There were also strong financial arguments against spending money during the war in buying land, and the general policy laid down by the Treasury was that—save in exceptional cases—all questions of purchase should be deferred until after the war.[3] No steps, therefore, were taken to utilise the powers of acquiring land conferred under the Act until October, 1917, when the Lands Department raised the question whether the Defence of the Realm (Acquisition of Land) Act would cover land which was being used for housing schemes if purchase was delayed till the war was over. Factories of various kinds came clearly within the scope of the Act, but housing schemes for workmen, premises for training munition workers, and schemes for the erection of factories on terms which involved the compulsory acquisition of the sites and an obligation to sell on agreed terms to third parties after the war, appeared to be on the border-line.

The Acquisition of Land Act laid it down that the consent of the Railway and Canal Commission would be required for the compulsory acquisition of any land taken for any purpose not covered by the Defence Acts 1842-1873 or the Military Lands Acts 1892–1903—*i.e.*, for defence purposes only or for military purposes only—and the Ministry took the advice of the Law Officers of the Crown as to whether the land for certain large housing schemes would be held to be covered by these Acts and might therefore be acquired without reference to the Commission. Stated broadly, the opinion of the Law Officers was to the effect that land coming within the provisions of Section 3 (1) (*a*) or (*b*) could be acquired compulsorily on behalf of the Crown during the war without the consent of the Railway and Canal Commission, provided that, in the opinion of the department concerned, it was required for the purpose of the defence of the realm or for any of the specific purposes for which land could be acquired under the Defence Acts or Military Lands Acts, but that otherwise the consent of the Railway and Canal Commission would be required before compulsory powers could be exercised. The effect of this opinion was that while land occupied for war purposes could in most cases be purchased

[1] See HIST. REC./H/1122/1 for a more detailed discussion of this case.

[2] *Parliamentary Debates* (1916), (*H. of C.*), LXXXIII, 1,574.

[3] War Office letter of 26 February, 1918, in Gen. No./8/768.

compulsorily during the war without the consent of the Commission, such consent would be necessary in a large number of cases if purchase were deferred until after the war.[1]

On the question whether application to acquire compulsorily ought to be made at once in cases where (under Clause 13) the consent of the Railway and Canal Commission was required, the Law Officers advised that it was a question of policy rather than law :—

> "The views of the tribunal upon the question may be more strict afterwards than while war is still raging. Moreover, the actual force of the necessity or expediency may well diminish when the war is concluded."

In deciding the question whether the land could be properly acquired under the Act, the Commission would be guided by the purpose for which it was wanted at the date on which application to acquire was made.

Being asked to advise the departments as to whether the Commission had the right to decide whether possession had really been taken for the purposes connected with the war, the Law Officers made a cautious and guarded reply :—

> "The functions of the Commission, apart from the function of assessing compensation, either themselves or on appeal from a referee, are by no means easy to define. The Commission are empowered, in certain cases, to confer upon the Crown a right of compulsory purchase by giving their consent. We think it may be said that in these cases the decision of the facts necessary to be determined to ascertain whether a case for giving consent has arisen has been entrusted to them. But even this is open to argument on the other side. We are clearly of opinion that in cases in which the consent of the Commission is not necessary, their position is merely that of assessors of compensation, and they are not empowered to decide whether the case is one in which the Act gives compulsory powers to the Crown or not. In such cases that question, if raised, must be decided by the ordinary Courts of Law, either in an action for an injunction to restrain proceedings for assessment of compensation, or in some other appropriate manner."

The opinion of the Law Officers strengthened the argument in favour of immediate action. It was clear that the arguments against expropriating an owner would appear much stronger when the war emergency was over, and another reason for immediate purchase lay in the fact that in many cases land occupied by the Ministry would be so transformed that if there was further delay it would be almost impossible for the Arbitration Tribunal to realise its condition before occupation began, and to make proper allowance for Ministry expenditure.

---

[1] 17 December, 1917. Gen. No. 8/768, 776, 778.

The Ministry therefore on 17 January wrote to the Treasury[1] urging that in all cases in which the acquisition of land was necessary to enable the Ministry to carry out its obligations action should be taken at once. The Treasury agreed (6 April, 1918) that the policy of deferring purchase must be modified, especially in cases where the Ministry had covenanted with a firm to convey land of which they were in occupation to the firm after the war, or cases in which it was clear that the factory or store erected on the site was permanently required for Government use after the war, and cases in which it could be established that purchase of the site was necessary in order to secure for the Government the value of the capital expenditure on the site.

Steps were therefore taken by the Ministry to acquire considerable areas of land on which factories or stores had been built. In many cases land was acquired for the sole purpose of selling the factory with its site, which would both recoup expenditure to some extent and avoid the cost of reinstatement. After the Armistice many of the factories erected on land held under the Defence of the Realm Regulations were declared surplus to requirements and were handed over to the Surplus Government Property Disposal Board for sale. This necessitated that, in many cases, the purchase of the site and the sale should be effected concurrently, but where difficulties in negotiating the purchase arose, the practice followed was to carry through the sale on the basis of an undertaking given by the Minister of Munitions to use his best endeavours to effect the purchase, reference if necessary being made to the Railway and Canal Commission for their sanction.

A decision of the Railway and Canal Commission on 1 July, 1920, justified the anticipation that the purpose for which the Ministry sought to acquire land would be closely scrutinised as soon as the war was over. In this case (Minister of Munitions *v.* Mackrill),[2] the Court refused to allow the Ministry to acquire, by compulsory purchase from an unwilling owner, land on which it had erected buildings for munitions purposes in order to re-sell the land and buildings to a distillery company. The Court took the view that the compulsory sale would inflict undue hardship and injustice upon the owner. The Ministry had not proved that the land was required for purposes of defence or that it was expedient from the public point of view to sell the buildings to a distillery company rather than to the owner of the site, a builder, who was prepared to give the same price for use in his trade. Thus " equity triumphed over another attempt of the Executive to expand the operation of emergency legislation."

It may be said in conclusion that in many cases involving purchase the powers conferred by the Act were never exercised ; they were held in reserve and only when difficulties arose with the owners of the land were notices served for the purpose of compelling the sale.

---

[1] Gen. No. 8/776. A similar letter from the Army Council is dated 26 February.

[2] *Times* Law Report, 2 July, 1920.

IV. Powers relating to the Control of Munitions Materials and Machinery.

The control of the raw materials of munitions, and of machinery and manufactured goods required for munitions production—ranging from cranes to clinical thermometers—was carried out under a group of regulations under the Defence of Realm Act, comprising 2B, 2BB, 2E, 7, 15C, 30A and 30B. Of these the earliest was 7,[1] which, as has already been seen, was one of those in which concurrent powers were vested in the Ministry under the Order in Council of 16 June, 1915. This gave power to requisition the output of factories producing or repairing warlike stores at a price to be determined by agreement or arbitration. Perhaps the most important of the group was Regulation 30A, which was issued on 24 September, 1915.[2]

---

[1] 7. The Admiralty or Army Council or the Minister of Munitions may by order require the occupier of any factory or workshop in which arms, ammunition, food, forage, clothing, equipment or stores of any description or any articles required for the production thereof, are or may be manufactured or in which any operation or process required in the production, alteration, renovation or repair thereof is or may be carried on, to place at their disposal the whole or any part of the output of the factory or workshop as may be specified in the order, and to deliver to them, or to any person or persons named by them, the output or such part thereof as aforesaid in such quantities and at such times as may be specified in the order ; and the price to be paid for the output so requisitioned shall, in default of agreement, be determined by the arbitration of a judge of the High Court selected by the Lord Chief Justice of England in England, of a judge of the Court of Session selected by the Lord President of the Court of Session in Scotland, or of a judge of the High Court of Ireland selected by the Lord Chief Justice of Ireland in Ireland.

In determining such price regard need not be had to the market price, but shall be had to the cost of production of the output so requisitioned and to the rate of profit usually earned in respect of the output of such factory or workshop before the war, and to whether such rate of profit was unreasonable or excessive, and to any other circumstances of the case.

If the occupier of the factory or workshop fails to comply with the order, or without the leave of the Admiralty or Army Council or the Minister of Munitions delivers to any other person any part of the output of the factory or workshop to which the order relates, he shall be guilty of an offence against these regulations.

For the purpose of ascertaining the amount of the output of any factory or workshop or any plant therein and the cost of production of such output, and the rate of profit usually earned in respect of the output of such factory or workshop before the war, the Admiralty or Army Council or the Minister of Munitions may require the occupier of any such factory or workshop, or any officer or servant of the occupier, or where the occupier is a company any director of the company, to furnish to the Admiralty or Army Council or the Minister of Munitions such particulars as to such output, cost, and rate of profit as they may direct, and may require any such particulars to be verified in such manner as they may direct, and if any such person fails to comply with any such requirement he shall be guilty of an offence against these regulations.

[2] In its final form Regulation 30A reads :—

No person shall, without a permit issued under the authority of the Admiralty, Army Council or Air Council or the Minister of Munitions, either on his own behalf or on behalf of any other person—

(*a*) buy, sell, or deal in ; or

(*b*) offer or invite an offer or propose to buy, sell, or deal in ; or

(*c*) enter into negotiations for the sale or purchase of or other dealing in any war material to which this regulation may for the time being be applied

The original object of this regulation was other than that in respect of which it derives its chief importance. It was issued at the instance of the War Office (M.I.5) for the purpose of putting a stop to speculations in arms and ammunition, but its usefulness in other directions was at once realised, and the Ministry availed itself of the wide powers which it conferred in order to control the machine tool trade, to control dealings in raw materials and to fix maximum prices. Under this regulation were issued the orders controlling aluminium, field-glasses, optical stores, and steel, to mention only a few of the earliest orders. The control of second-hand railway material—an important development of the Ministry's activities—was also based upon this regulation.

Next in order of date was 2B,[1] which was issued on 15 February,

---

by order of the Admiralty, Army Council or Air Council or the Minister of Munitions, or any right in any invention, design, or process of manufacture relating to any war material, being war material to which this regulation may for the time being be so applied, whether or not the sale, purchase, or dealing is, or is to be, effected in the United Kingdom.

[1] This Regulation in its final form reads :—

2B. It shall be lawful for the Admiralty, Army Council or Air Council or the Minister of Munitions to take possession of any war material, food, forage and stores of any description and of any articles required for or in connection with the production thereof.

Where any goods, possession of which has been so taken, are acquired by the Admiralty, Army Council or Air Council or the Minister of Munitions, the price to be paid in respect thereof shall in default of agreement be determined by the tribunal by which claims for compensation under these regulations are, in the absence of any express provision to the contrary, determined.

In determining such price regard need not be had to the market price but shall be had—

(*a*) if the goods are acquired from the grower or producer thereof, to the cost of production and to the rate of profit usually earned by him in respect of similar goods before the war and to whether such rate of profit was unreasonable or excessive, and to any other circumstances of the case ;

(*b*) if the goods are acquired from any person other than the grower or producer thereof, to the price paid by such person for the goods and to whether such price was unreasonable or excessive, and to the rate of profit usually earned in respect of the sale of similar goods before the war, and to whether such rate of profit was unreasonable or excessive, and to any other circumstances of the case ; so, however, that if the person from whom the goods are acquired himself acquired the goods otherwise than in the usual course of his business, no allowance, or an allowance at a reduced rate, on account of profit shall be made :

Provided that where by virtue of these regulations or any order made thereunder the sale of the goods at a price above any fixed price thereunder is prohibited the price assessed under this regulation shall not exceed the price so fixed.

If, after the Admiralty, Army Council or Air Council or the Minister of Munitions have issued a notice that they have taken or intend to take possession of any war material, food, forage, stores or article in pursuance of this regulation, any person having control of any such material, food, forage, stores or article (without the consent of the Admiralty, Army Council or Air Council or the Minister of Munitions) sells, removes, or secretes it, or deals with it in any way contrary to any conditions imposed in any licence, permit, or order that may have been granted in respect thereof, he shall be guilty of an offence against these regulations.

The Food Controller may, as respects articles to which his powers under Regulations 2F to 2J extend, exercise the like powers as are by this regulation

1916. In its original form this regulation merely gave power to the Admiralty, Army Council or Ministry of Munitions to take possession of war material, food, forage and stores of any description, and of any articles required for or in connection with the production thereof. It became necessary, however, to lay down regulations to determine the price to be paid for such material and accordingly the regulation was at a later date (23 February, 1917) amended. The immediate object was to bring the principle of compensation for goods requisitioned under it into line with that established in the case of Regulation 7, and to ensure that the tribunal determining such compensation should not be bound to award the fancy prices which might have been reached in the market owing to restriction of output, lack of competition and other extraordinary factors arising out of the war.

On 3 October, 1916, Regulation 2E[1] was made as the outcome of conferences between the War Office and the Ministry of Munitions. It was primarily introduced at the instance of the War Office (Surveyor-General's Department) for the purposes of the British wool purchase scheme, and gave power to the Minister to regulate manufacture or dealings in war material, food, forage or stores.

This regulation, while covering the ground already covered by Regulation 30A, further extended and strengthened it. In 1918, at the instance of the Ministry of Munitions, two amendments were introduced. By the first of them the word "use" was inserted after "manufacture." This was necessitated by the fact that the Minister had been compelled, owing to the shortage of supply, to restrict use as well as manufacture. Among other cases in which this had become necessary were those of gas-works retort carbon, imported petroleum and mica. The other amendment was the insertion of the word "repair" after "manufacture," the immediate object of which was to enable the Minister to fix rates for the repair of railway wagons, in order to check the rise in prices.

---

conferred on the Admiralty, Army Council, Air Council, and Minister of Munitions, and the Food Controller may by order direct that any action in contravention of, or failure to comply with, this regulation or any order or requirement made thereunder, shall, so far as it relates to the powers of the Food Controller, instead of being an offence, be a summary offence against these regulations, and this regulation shall have effect accordingly.

[1] The original wording was :—

2E. The Admiralty or Army Council or the Minister of Munitions may by order regulate, restrict, or prohibit the manufacture, purchase, sale, delivery of or payment for, or other dealing in, any war material, food, forage, or stores of any description or any article required for or in connection with the production thereof, and if any person refuses to sell any article, the sale whereof is regulated by any such order, he may be required by the Admiralty or Army Council or the Minister of Munitions to sell it on the terms and subject to the conditions on and subject to which the sale thereof is authorised by the order.

If any person fails to comply with any provision of any such order or any requirements made thereunder, or aids or abets any other person, whether or not such other person is in the United Kingdom, in doing anything which, if done in the United Kingdom, would be a contravention of any such order, he shall be guilty of an offence against these regulations, and if such person is a company, every director and officer of the company shall also be guilty of an offence against these regulations unless he proves that the contravention took place without his knowledge or consent.

In this connection it is interesting to find that among the classes of articles controlled by virtue of these regulations was agricultural machinery, which could only by a stretch of language be described as war material. When, however, the Government's policy of developing the home production of wheat stimulated the demand for agricultural machinery it was not unnatural that the Ministry of Munitions, controlling as it did the supply both of labour and of raw materials, should have been called upon to undertake the control of such machinery, even though this new duty went beyond the original functions of the department. It will be observed in this connection that Regulation 2E was drawn in the widest manner, and that its terms were such that this class of machinery fell within them. Among other materials controlled under this regulation, mention may be made of waste paper. It may be said that under certain of the orders made under one or other of these regulations, in particular the orders relating to lead, copper, pyrites, phosphate rock, and tar oils, the Ministry of Munitions practically became the owner, for the time being, of all stocks of these materials in the country. Under other orders it was made necessary for any person selling or dealing in material of the classes controlled, first to procure a licence to enable him to do so. The main objects aimed at in the framing of these orders were the diversion of the manufacture and supply of the materials in question into the most useful channels, the avoidance, so far as possible, of waste, and the prevention of speculative dealings by the regulation of prices. There is, however, one other aspect which must not be overlooked; in two cases the regulations were utilised for the purpose of fostering industries, namely, the optical and chemical glass industry and the potash industry, which were new to this country, and which were successfully developed under these regulations.

Regulation 30B[1] (29 February, 1916) prohibited any person from selling, buying or offering to sell or buy iron (including pig-iron), steel

[1] 30B. It shall not be lawful for any person on his own behalf or on behalf of any other person to sell or buy, or to offer to sell or buy,

(*a*) any of the following metals: iron (including pig-iron), steel of all kinds, copper, zinc, brass, lead, antimony, nickel, tungsten, molybdenum, ferro-alloys; or

(*b*) any other metal which may be specified in an order of the Admiralty or Army Council or the Minister of Munitions as being a metal required for the production of any war material,

unless in the case of a seller the metal to be sold is in the possession of the seller or is in the course of production for him, or in the case of a buyer the purchase is made for or on behalf of a consumer; and it shall be lawful for the Admiralty or Army Council or the Minister of Munitions, or any person authorised by them or him for the purpose, to require any person who on his own behalf or on behalf of any other person, has sold or bought, or offered to sell or buy any such metals, to prove that the sale or purchase complies with the requirements of this regulation, and if any such person on being so required fails to produce satisfactory proof that it does so comply he shall be guilty of an offence against these regulations.

Provided that it shall be lawful for the Admiralty or Army Council or the Minister of Munitions by order to exclude from the provisions of this regulation any of the metals above mentioned, and whilst any such order remains in force this regulation shall have effect as if such metal were not mentioned therein.

of all kinds, copper, zinc, brass, lead, antimony, nickel, tungsten, molybdenum, ferro-alloys, or any other metal which might be specified in an order as being metal required for the production of any war material, unless, in the case of a seller, he was in possession of the metal to be sold, or it was in course of production for him, or, in the case of a buyer, unless he was buying for or on behalf of a consumer. The object of this regulation was to put a stop to speculative dealings on the Metal Exchange, and shortly after it was issued a circular was sent out stating that it was not intended to enforce its provisions in case of *bona-fide* dealings. It was, however, a power held in reserve, designed to operate as a check on prices.

Regulations, 2AAA and 9GG also find a place in any consideration of the control of materials. Regulation 9GG[1] (13 March, 1917) gave power to the Minister to take possession of metalliferous, stratified ironstone, shale or fire-clay mines or of quarries. Under it the Minister took possession of all the iron ore mines in Cumberland and Lancaster (24 July, 1917). The mines were worked under the management of the owners in accordance with an agreement entered into with them. This regulation was also applied to certain wolfram and other metalliferous mines. Regulation 2AAA[2] (16 January, 1918) empowered

---

[1] 9GG. (1) Where the Minister of Munitions is of opinion that for securing the public safety and the defence of the Realm it is expedient that this regulation should be applied to any metalliferous mines, or to any mines of stratified ironstone, shale, or fire-clay, not being coal mines, or to any quarries, he may by order apply this regulation, subject to any exceptions for which provision may be made in the order, to all or any of such mines or quarries, either generally or in any special area, or to any special mine or quarry.

(2) Any mine or quarry to which this regulation is so applied shall by virtue of the order pass into the possession of the Minister of Munitions as from the date of the order, or from any later date mentioned in the order; and the owner, agent, and manager of every such mine or quarry and every officer thereof, and where the owner of the mine is a company every director of the company shall comply with the directions of the Minister of Munitions as to the management and user of the mine or quarry, and if he fails to do so he shall be guilty of a summary offence against these regulations.

(3) It is hereby declared that the possession by the Minister of Munitions under this regulation of any mine or quarry shall not affect any liability of the actual owner, agent or manager of the mine or quarry under the Coal Mines Acts, 1887 to 1914, or the Metalliferous Mines Regulation Acts, 1872 and 1875, or the Quarries Act, 1894, or the Factory and Workshop Act, 1901, or any Act amending the same.

(4) Any order of the Minister of Munitions under this regulation may be revoked or varied as occasion requires.

(5) The Army Council may, as respects any road stone quarries, exercise the like powers as are by this regulation conferred on the Minister of Munitions, and the expression "road stone quarries" includes slag dumps and slag works producing road materials, and the Army Council shall as respects road materials have the like powers as are exercisable under Regulation 2JJ by the Board of Trade as respects articles of commerce.

[2] 2AAA. With a view to developing as economically and expeditiously as possible any supply of petroleum which may exist in strata in the United Kingdom it shall be lawful for the Board of Trade or the Minister of Munitions, or any person authorised by them or him, but for no other person, to search and

the Board of Trade and the Minister of Munitions to search and bore for and get petroleum in the United Kingdom, and to enter on or take possession of any land, and sink wells and construct other works thereon.

V. Powers relating to the Control of Industry.

(*a*) Priority.

The legal basis of the general control of industry which was exercised through the system of priority, was Regulation 8A[1] (23 March, 1915), which empowered the Ministry to require a factory to carry on its work in a way that would make it as useful as possible for the production of war material, to restrict the work done in a factory, the employment of labour and the supply of metals or materials, and to transfer the plant to other factories. Priority in the execution of orders for coal and coke in accordance with their national importance

---

bore for and get petroleum, and the Board of Trade or Minister of Munitions or a person so authorised for the purposes aforesaid may enter on or take possession of any land and sink wells and construct other works thereon.

If any person searches or bores for or gets petroleum in contravention of this provision he shall be guilty of a summary offence against these regulations.

For the purposes of this regulation petroleum means all petroleum and its relative hydrocarbons (excluding coal and shales) and natural gas existing in their natural conditions in strata, but does not include natural gas set free in the course of mining or other lawful operations.

[1] 8A. It shall be lawful for the Admiralty, Army Council or Air Council or the Minister of Munitions—

(*a*) to require any work in any factory or workshop to be done in accordance with the directions of the Admiralty, Army Council or Air Council or the Minister of Munitions, given with the object of making the factory or workshop or the plant or labour therein as useful as possible for the production of war material, and to require returns as to the nature and amount of work done in any factory or workshop;

(*b*) to regulate or restrict the carrying on of any work in any factory, workshop or other premises, or the engagement or employment of any workman, or all or any classes of workmen, therein, or to remove the plant therefrom, with a view to maintaining or increasing the production of munitions in other factories, workshops or premises, or to regulate and control the supply of metals and material that may be required for any articles for use in war;

and the occupier and every officer and servant of the occupier of the factory, workshop or premises, and any other person affected by any such directions, regulations or restrictions, and where the occupier is a company, every director of the company, shall obey the directions, regulations or restrictions of the Admiralty, Army Council or Air Council or the Minister of Munitions so given, and if he fails to do so he shall be guilty of an offence against these regulations.

Where under this regulation any return has been required or any directions regulating the priority to be given to work at any factory, workshop or other premises have been given, and any person in any such return, or in any certificate or document given or issued for the purpose of securing priority for any work in pursuance of such directions, makes any false statement or false representation, he shall be guilty of an offence against these regulations.

was secured by Regulation 2D.[1] The object of the system was, primarily, to ensure that work which was necessary for the effective prosecution of the war should receive preference above all other classes of work. The method by which this result was ensured was by the organisation of a system of permits entitling the work to which they were attached to a call upon the means of production. These permits or certificates were classified with regard to the urgency of the work to be undertaken. It will be obvious that the issue of priority certificates was closely bound up with the question of the control of raw materials and with each extension of that control the sphere within which the system of priority operated widened.[2]

Obviously this system had a profound effect on the industrial life of the country. The priority principle was extended not only to munitions industries but to other industries which were required to be carried on in such a way as to produce or conserve the greatest quantity of munitions materials. Thus gas undertakings were required to scrub their gas for the recovery of benzol and toluol, owners of blast furnaces were instructed to make arrangements for the recovery of potash from furnace dust, and owing to the shortage of alcohol for the manufacture of propellants whisky distillers were forbidden (May, 1916) to use grain, rice, sugar, or molasses for the manufacture of whisky and other alcoholic spirits. (Regulation 30D.)[3]

Regulation 8G[4] (11 May, 1918), which placed the manufacture of

---

[1] 2D. It shall be lawful for the Admiralty, Army Council or Air Council or the Minister of Munitions, or any person authorised by them to act in their behalf, after consultation with the Board of Trade, to give directions as to the priority to be given in the execution of orders or contracts for the supply of coal or coke, with a view to securing precedence for orders or contracts in accordance with their national importance, and the owner, agent or manager of any mine or any other person affected by the directions who fails to comply with any directions so given, and any person who in any certificate or document given or issued for the purpose of securing priority for any order or contract in pursuance of such directions makes any false statement or false representation, shall be guilty of an offence against these regulations.

[2] The administrative organisation of the priority system will be described elsewhere.

[3] 30D. After the twenty-eighth day of May, nineteen hundred and sixteen, no person shall without a permit issued under the authority of the Minister of Munitions, use or permit to be used any grain, either malted or unmalted, rice, sugar, or molasses, or any other material which may for the time being be specified in an order issued by the Minister of Munitions, in or for the manufacture or production of whisky or any other alcoholic spirits, and if any person acts in contravention of this provision, or fails to comply with any condition subject to which a permit under this regulation has been granted, he shall be guilty of an offence against these regulations.

[4] 8G. It shall be lawful for the Admiralty or Army Council or the Minister of Munitions to require the manufacture or production of gas in any gas works to be carried out in accordance with any directions, regulations or restrictions given, made or imposed by the Admiralty, Army Council, or Minister of Munitions, with the object of making such gas works or the plant or labour therein as useful as possible for the production of any war material or any articles required for or in connection with the production thereof and in particular to require that all

gas under the control of the Minister, was introduced to meet a situation which had arisen as a result of the Gas (Standard of Calorific Power) Act, 1916. Under this Act the Board of Trade was empowered to issue orders substituting a calorific standard for the illuminating standard, which up to that time had been usual. Few of the gas undertakings were, however, able to maintain even the reduced standard required of them in view of the demands made upon them by the Ministry of Munitions that they should scrub their gas to the utmost extent for the production of toluol and benzol. In February, 1918, the Portsea Island Gas Company was prosecuted by the Portsmouth Corporation and fined for not maintaining its gas supply at the required standard. Other gas companies were threatened with prosecution, and accordingly Regulation 8G was introduced to afford them protection. The regulation required the gas undertakings to carry on the manufacture or production of gas with a view to making it as useful as possible for the production of war material, and, in particular, that the toluol, benzol or other hydrocarbons contained in the gas should be extracted therefrom by scrubbing or otherwise before the gas was supplied to consumers. No further protests were raised against the inferior quality of the gas, and the processes of oil and tar scrubbing were continued throughout the war.[1]

Analogous to these regulations were those restricting building construction, lighting, and the holding of trade exhibitions and fairs.

By the summer of 1916 it was found that building work undertaken for the Admiralty, War Office and Ministry of Munitions was being seriously delayed, through scarcity of building labour. This was due to the operation of the Military Service Acts and to the considerable amount of private work which was being carried on. Action had been taken under Regulation 8A to put a stop to a certain number of building undertakings, but at the same time it was found extremely difficult to obtain adequate information as to the extent of building work going on in different parts of the country, and it was realised that difficult questions of compensation were likely to arise in connection with particular work which had been stopped by special order. In these circumstances, it appeared that the only satisfactory method of dealing with the situation was to place a general restriction on all such

---

or any part of the toluol, benzol or other hydrocarbons contained in the gas produced or any other constituents of such gas shall be extracted therefrom, by scrubbing or otherwise, before the gas is supplied to the customers in the district supplied by such gas works ;

The occupier and every officer and servant of the occupier of the gas works and any persons affected by any such directions, regulations or restrictions and, where the occupier is a corporation or company, every officer of such corporation or company shall obey such directions, regulations or restrictions (notwithstanding the requirements of any statute or statutory order with regard to the illuminating or calorific power of the gas supplied from such gas works) and if he fails to do so he shall be guilty of a summary offence against these regulations.

[1] See Vol. VII, Part IV.

work. A Regulation was accordingly framed, 8E[1] (12 July, 1916), giving power to the Minister of Munitions to regulate or restrict the carrying on of building, construction, alteration, repair, decoration or demolition work, as defined in the regulation. It was not, however, intended that the regulation should apply to works costing less than £500, unless they involved the use of constructional steel, of which there was a very serious shortage. Although this regulation was one which affected other Government Departments, it was thought to be desirable that only one authority should be charged with its administration, and accordingly the Minister was constituted the sole authority for the purpose of the regulation, the other departments interested being represented on the Building Labour Committee, through whom the regulation was operated. In February, 1918, the administration of the regulation was transferred to the Ministry of National Service, as the matter was one which primarily concerned man power, and the Ministry of Munitions accordingly ceased to be responsible, merely being consulted in cases where its interests were concerned.

Regulation 11A[2] (December, 1917) gave the Minister of Munitions power to require all lights to be restricted between such hours and in such areas as might be considered necessary in order to increase

---

[1] 8E. It shall be lawful for the Minister of Munitions by order to regulate or restrict the carrying on of building and construction work as hereinafter defined, and by such order to prohibit, subject to such exceptions as may be contained in the order, the carrying on of such work without a licence from the Minister.

Provided that where a first application for a licence under any order has been made and is pending for the carrying on of work which has already been commenced at the date when such licence first became necessary, nothing in the order shall prohibit the carrying on of the work until the licence has been refused.

If any person affected by any such order contravenes or fails to comply with the provisions thereof, or if any person for the purpose of obtaining such a licence as aforesaid makes any false statement or false representation he shall be guilty of a summary offence against these regulations.

For the purposes of this regulation the expression " building and construction work " means the construction, alteration, repair, decoration, or demolition of buildings, and the construction, reconstruction, or alteration of railways, docks, harbours, canals, embankments, bridges, tunnels, piers, and other works of construction or engineering.

[2] This regulation in its final form reads :—

11A. The Minister of Munitions, with a view to maintaining or increasing the supply of light, heat, or power for the purpose of the production, repair or transport of war material or any other work necessary for the successful prosecution of the war, may

(*a*) by order direct that lights of any specified class or description shall be extinguished or their use restricted to such extent, between such hours, within such area, on such premises, and during such period, as may be specified in the order ; or

(*b*) prohibit, restrict or otherwise regulate and control the supply or means of supply of electricity to, or its use in, any premises or class of premises, or any place or undertaking,

and if any person having control of any light, or occupying or having control of, or managing, or being in charge of, premises in on or in connection with which any light is used acts in contravention of any such order as to lights, or if any person fails to comply with or acts in contravention of any order or requirement

the production of war material by means of increased supply of power. In August, 1918, the coal situation had become serious and involved a further shortage in the supply of electricity. Accordingly, Regulation 11A was amended to deal with the new situation which had arisen. To some extent the Home Office, by reducing the lighting of shops, and the Board of Trade, by the Household Fuel and Lighting Order, 1918, had met the difficulty, but they had not gone far enough. The amendment was made to enable the Minister to take steps to close any unnecessary power stations and to cause, when practicable, the linking up of one power station with another so as to economise power and to provide a stand-by in case of accident, and further, to prohibit the making of new connections or the increase of the means of consumption in the case of industrial establishments when output was not of an essential character. Schemes had in numerous cases been put forward with the object of ensuring a more even and economical use of power, and in certain cases they had failed owing to the Minister not then possessing powers sufficiently wide to compel their adoption. It was for this state of affairs that the amendment provided a remedy.

Regulation 7A[1] (22 December, 1915) empowered the Minister of Munitions, after consultation with the Board of Trade, to prohibit or place restrictions upon the holding of exhibitions.

---

hereunder as to the supply, or means of supply, or use of electricity, he shall be guilty of a summary offence against these regulations :

Provided that—

(i) This regulation shall not apply to any lights required to be kept lighted by a competent naval or military authority, or other officer authorised by him for the purpose, or under any order made under Regulation 11 by the Secretary of State, or the Secretary for Scotland ; and

(ii) No order or requirement shall be made for the closing of any power station belonging to any local authority or for the connection of any such power station with any other power station except with the concurrence of the appropriate Government Department, and if any question arises as to which Government Department is the appropriate Government Department the question shall be finally determined by the Treasury.

[1] This regulation in its final form reads :—

7A. Where it appears to the Minister of Munitions that the holding of any exhibition to which this regulation applies or of exhibitions of any class or description to which this regulation applies would prejudicially affect the production of war material, he may, after consultation with the Board of Trade, by order either prohibit the holding of any such exhibition or of all exhibitions of any class or description specified in the order, or impose conditions or restrictions on the holding thereof, and any person who holds an exhibition or exhibits at an exhibition in contravention of the provisions of any such order, or of the restrictions and conditions therein contained, shall be guilty of an offence against these regulations.

A person intending to hold an exhibition to which this regulation applies shall, at least one month before the date fixed for the opening thereof, give to the Minister of Munitions notice in writing of his intention, together with such particulars in relation to the exhibition as the Minister of Munitions may require, and if he fails to do so shall be guilty of an offence against these regulations.

Exhibitions to which this regulation applies are exhibitions and fairs, the exhibits whereat consist in whole or in part of the products of any industrial

The purpose of this regulation was primarily to prevent information with regard to munitions of war or new processes of manufacture, or as to areas in which munitions work was being carried on, from being obtained by the enemy, and also to prevent the waste of time and labour expended in attaining the high state of finish required in articles intended for exhibition purposes. In March, 1917, a further paragraph was added to this regulation, which gave powers to the Minister, after consultation with a Department of the Government which might be interested, to prohibit agricultural exhibitions where, owing to the demand on labour and plant required for transport purposes, it might be considered that the holding of such exhibitions was against the national interest. Under this regulation the Ministry either prohibited entirely certain exhibitions or exercised a strict control over the class of exhibits shown.

(*b*) Factories and Workshops.

The position of the Ministry of Munitions with regard to the holding of land has already been dealt with. As has been seen above, in those cases where it was necessary to take possession of land for the sites of factories, the requisite steps were taken at the instance of the Ministry under Regulation 2,[1] though in numerous instances the land on

---

or manufacturing process, or the machines, tools, and implements used for the purpose of any such process.

A like power may be exercised by the Minister of Munitions with respect to agricultural exhibitions whereat the exhibits do not include any such products, machines, tools or implements as aforesaid where it appears to the Minister, after consultation with such other Government Departments as appear to him to be interested, that by reason of the demand on labour and plant required for the transport of exhibits to and from the exhibition and otherwise in connection with the holding thereof, it is in the national interest that the holding of the exhibition should be prohibited, and the foregoing provisions of this regulation shall apply accordingly.

[1] 2. It shall be lawful for the competent naval or military authority and any person duly authorised by him, where for the purpose of securing the public safety or the defence of the Realm it is necessary so to do—

(*a*) to take possession of any land and to construct military works, including roads, thereon, and to remove any trees, hedges and fences therefrom;

(*b*) to take possession of any buildings or other property, including works for the supply of gas, electricity or water, and of any sources of water supply;

(*c*) to take such steps as may be necessary for placing any buildings or structures in a state of defence;

(*d*) to cause any buildings or structures to be destroyed, or any property to be moved from one place to another, or to be destroyed;

(*e*) to take possession of any arms, ammunition, explosive substances, equipment, or warlike stores (including lines, cables, and other apparatus intended to be laid or used for telegraphic or telephonic purposes);

(*f*) to do any other act involving interference with private rights of property which is necessary for the purpose aforesaid.

If, after the competent naval or military authority has issued a notice that he has taken or intends to take possession of any movable property in pursuance of this regulation, any person having control of any such property sells, removes, or secretes it without the consent of the competent naval or military authority he shall be guilty of an offence against these regulations.

which such factories were erected was acquired by agreement, while in others no land problem arose, as buildings were leased or lent rent free. The powers under which the work in such factories was carried on were those which had, in general terms, been conferred on the Minister by the Ministry of Munitions Act, 1915, and the Order in Council of the 16 June, 1915. There was, however, another class of cases in which the Ministry took over control of an existing factory and carried on its work; this was done in virtue of the powers conferred by Regulation 8.[1]

Regulation 8A, which has already been referred to as the basis of the priority system, gave powers to the Minister to control the manufactures conducted at various factories and workshops, and, by this means, to exercise control over many important industries.

The operation by the Ministry of national factories, the occupation of premises and the control of factories for the purposes of the Ministry, required the enforcing of safeguards, both having regard to the nature of the work carried on and, in some cases, to the health of the persons employed on certain processes. With this object, certain regulations were introduced. The first of these was 29A[2] (22 December, 1915),

[1] 8. The Admiralty, Army Council or Air Council or the Minister of Munitions may take possession of any factory or workshop or of any plant belonging thereto without taking possession of the factory or workshop itself, and may use the same for His Majesty's naval or military or air service at such times and in such manner as the Admiralty, Army Council or Air Council or the Minister of Munitions may consider necessary or expedient, and the occupier and every officer and servant of the occupier of the factory or workshop, and where the occupier is a company, every director of the company, shall obey the directions of the Admiralty, Army Council or Air Council or the Minister of Munitions as to the user of the factory or workshop or plant, and if he fails to do so he shall be guilty of an offence against these regulations.

[2] 29A. If any person enters or is found upon any factory, workshop, or other place in which work is carried on, specified in any order made for the purpose by the Admiralty, Army Council or Air Council or the Minister of Munitions, as being a factory, workshop, or place which, in the interests of the public safety or of the defence of the realm, it is necessary to safeguard, not having with him a written permit issued to him by a person nominated for the purpose by—

(*a*) the Admiralty, Army Council or Air Council or the Minister of Munitions, or

(*b*) the occupier of, or other person having control of the work carried on in, the factory, workshop, or place,

he shall be guilty of an offence against these regulations.

Every person authorised to issue permits for the purpose of this regulation shall keep a list of the names and addresses of all persons to whom he has issued permits, and every such list shall be open to inspection by any person authorised for the purpose by the Admiralty, Army Council or Air Council or the Minister of Munitions.

In every factory, workshop, or place to which this regulation is for the time being applied by an order made thereunder, a copy of the order shall be kept affixed at or near every entrance thereto.

Nothing in this regulation shall apply to any person who enters any factory, workshop, or other place in the exercise of any right of entry conferred on him as an inspector under the Factory and Workshop Acts, 1901 to 1911, the Explosives Act, 1875, or any other enactment, nor shall this regulation apply to any person or classes of persons who, as respects any particular factory, workshop or other place, may be exempted by order of the Admiralty, Army Council or Air Council or the Minister of Munitions.

which prohibited unauthorised persons from entering, without a written permit, any factory, workshop or other place which, in the interests of public safety or of the defence of the realm it was necessary to safeguard. A system of permits was accordingly instituted, such permits being either for the purpose of admitting to any part of the factory or for admitting to some particular part of the premises, for instance, to enable accountants to obtain access to books, etc.

Under the Explosives Act of 1875 rules for the factories of contractors making explosives had been made by the Home Office. The Chief Superintendent of Ordnance Factories had been exempted from the Act and had made his own rules for Woolwich and Waltham. After the formation of the Ministry this practice was continued, rules for the national factories being made by the departments administering them in consultation with the Home Office.

The factories handling T.N.T. were in a special position, as such factories had been exempted from the provisions of the Explosives Acts by an Order in Council (11 June, 1910). During the first two and a half years of the war the Ministry made rules to ensure safety precautions at these factories, but it was hampered by the absence of powers to insist on the execution of recommendations made and by the existence of the Order in Council which led manufacturers to treat too lightly the serious explosion risks attached to this industry.[1] As a result of the explosion at Silvertown,[2] which caused enormous destruction and heavy loss of life, a further measure of precaution was taken in January, 1917, and by Regulation 35A[3] powers were conferred which enabled rules to be made after consultation with a Secretary of State (*e.g.*, the Home Office) for the purpose of securing the safety of any place where ammunition, explosives, or any highly inflammable material were manufactured, stored or handled. This regulation made particular

[1] 74/Explosives/75.

[2] See Vol. X, Part IV, Chapter X.

[3] 35A. The Admiralty, Army Council or Air Council or the Minister of Munitions, after consultation with a Secretary of State, may make rules for the purpose of securing the safety—

(*a*) of any factory, store, magazine, wharf, or other premises, or any vessel, vehicle, receptacle, or place which in their opinion it is necessary in the interests of the public safety and the defence of the Realm specially to safeguard against the risk of fire and other dangers on account of the nature of the materials manufactured, treated, produced, handled, carried, stored or deposited therein or in the vicinity thereof; and

(*b*) of any person in or in the vicinity of any such premises, vessel, vehicle receptacle, or place;

and in particular rules prohibiting, except as may be otherwise provided under or in pursuance of the rules, any person whilst in or in the vicinity of such premises, vessel, vehicle, receptacle, or place from smoking, or having in his possession any match or apparatus of any kind for producing a light, or any tobacco, cigar, cigarette, pipe, or contrivance for smoking.

The Food Controller may as respects any premises to which his powers under Regulation 2GG extend exercise the like powers as are by this regulation conferred on the Admiralty, Army Council, Air Council and Minister of Munitions.

Any person who fails to comply with any such rule shall be guilty of a summary offence against these regulations.

reference to the prohibition in such places of the carrying of matches or apparatus for producing a light, tobacco, cigars, cigarettes, or pipes. Rules under this order were made by the Gun Ammunition Filling Department, the Trench Warfare Supply Department, the Explosives Supply Department, and the Central Stores Department for the factories and stores under their control. The Order in Council exempting T.N.T. from the provisions of the Explosives Act was cancelled on 22 August, 1917.

For the better ensuring of the safety of factories and other places in which the Ministry was either carrying on work or was interested, a Fire Protection Advisory Committee was formed at the end of 1917, charged with the investigation of the existing means of protection against fire in such places when the risk was considerable, and with the duty of making recommendations with regard thereto. In the beginning of 1918 a Committee on the Policing of Munition Factories was also formed, with the general duty of supervising the system adopted for the protection of factories against acts of sabotage, theft or other unlawful acts. During 1918 a Special Service Branch was brought into existence for the purpose of investigating supposed cases of sabotage.

Before passing from the question of the protection of factories, special reference should be made to Gretna. The site of the National Explosives Factory was partly within the police area of Cumberland and partly within that of Dumfries, and owing to the large extent of the works and buildings for the accommodation of the persons employed, it was held desirable to unify the control of the police in the area covered by the factory and its dependencies, and accordingly Regulation 55A[1] (24 January, 1917) was introduced for this purpose. This

[1] 55A. (1) Where a Secretary of State, after consultation with the Admiralty, Army Council or Air Council or the Minister of Munitions, is satisfied, as respects any area which is not wholly situated within the boundaries of one police area, that it is expedient to meet the exigencies of the naval, military or air service or for reasons connected with the supply of munitions that the control of police in the area should be unified, he may by order—

(*a*) constitute the area a special police area and define the limits thereof ;

(*b*) assign to the special police area such number of constables belonging to the police forces of the police areas (or any of them) in which any part of the special police area is contained, or acting in those areas, in such proportion as may be agreed between the departments and authorities concerned or, in default of or pending agreement, as may be directed by the Secretary of State ;

(*c*) provide that constables assigned to the special police area shall, for the purpose of control and discipline, act under the direction of a single authority, being either the chief officer of police of an existing police force or such other person or authority as may be specified in the order, and empower such authority to exercise any of the powers that may be exercised by the police authority or chief officer of any county police force, including the power of appointing constables for the special police area ; and

(*d*) make such additional and supplemental provisions (including provisions for obtaining assistance from other police forces) as appear to him necessary for the purpose of giving full effect to the order ;

and a Secretary of State may also give from time to time such directions as appear to him expedient for the purpose of giving full effect to the order.

(2) All constables assigned to or appointed for any special police area or any part of such area shall, without prejudice to any of their other powers, have

regulation enabled a Secretary of State, after consultation with the Minister of Munitions, or with other specified Departments, to constitute a special police area and to assign to it constables belonging to those police areas, portions of which were contained in the newly constituted area, all of these constables being controlled by a single authority.

Gretna was one of the few districts to which the provisions of Regulation 35c[1] (14 April, 1917), which gave powers to the Minister to make rules for securing order and good behaviour in a munition area, were applied.

In the spring of 1916 it became necessary that steps should be taken to secure an adequate supply of water, light, heat and power to camps, buildings and factories occupied by the War Departments.

---

all the powers, duties and privileges of constables throughout such area and also throughout any police area any part of which is included in such special police area.

(3) The powers conferred by this regulation on a Secretary of State shall, as respects any area situated wholly in Scotland, be exercised by the Secretary for Scotland: and shall as respects any area situated partly in England and partly in Scotland, be exercised jointly by a Secretary of State and the Secretary for Scotland.

---

[1] 35c. (1) It shall be lawful for the Admiralty, Army Council or Air Council or the Minister of Munitions, with the concurrence of a Secretary of State (or as respects Scotland, the Secretary for Scotland) by order—

(*a*) to declare that it is important in the interests of public safety as respects any area defined in the order, as being an area where bodies of His Majesty's Forces or of the Forces of any of His Majesty's Allies are located or undergoing training, or where arms, ammunition, explosives or substances required for the production thereof (in this regulation referred to as munitions of war) are produced, treated, stored or handled, that rules should be made under this regulation; and

(*b*) to make rules accordingly for securing and preserving order and good behaviour in the area, and maintaining in the area the efficiency of any of His Majesty's Forces, or of the Forces of any of His Majesty's Allies, or of any persons engaged in producing, treating, or handling munitions of war, whether by controlling or regulating the admission to or presence, movements, and behaviour in the area of any person or class of persons whose unrestricted admission to or presence in the area is likely to prejudice the training, discipline, administration, or efficiency of any of His Majesty's Forces, or of the Forces of any of His Majesty's Allies, or the efficiency of any person engaged in producing, treating, or handling munitions of war, or by any other means.

(2) Without prejudice to the generality of the foregoing provisions the rules may require the presence of any persons or class of persons in the area to be notified to the police, and may empower a competent naval or military authority to prohibit any person from residing or remaining in or entering the area who has since the commencement of the war been convicted of any contravention of or non-compliance with the rules, or of any offence against public order or decency, or to impose on such person whilst in the area any condition as to reporting movements or otherwise.

(3) If any person contravenes or fails to comply with any rule made under this regulation he shall be guilty of a summary offence against these regulations. and if any person remains in or enters the area in contravention of a prohibition issued under the rules he may be removed therefrom by the direction of the competent naval or military authority.

It was found that prices were everywhere rising and that, although the departments had hitherto secured terms below public rates, there was a tendency for this privilege to be withdrawn and for commercial rates to be charged. It was also found that, as regards water, terms had to be arranged by agreement, which often necessitated long and troublesome negotiations, and that while the departments were often powerless to obtain reasonable rates, they were in addition liable to be subjected to irksome conditions. It was to remedy this state of affairs that Regulation 8D[1] (23 May, 1916) was introduced. This regulation gave power to the Ministry of Munitions, the Army Council, the Admiralty, and subsequently the Air Council, to require undertakings to supply water, heat, light or power to any factory, building, camp or other premises belonging to or used by those departments. The order was applied specifically in some cases (*e.g.*, at Hackney Wick), or generally by direction of the Controller of Electricity Supply.

Regulation 6A[2] conferred no powers on the Minister, but was of considerable importance to him. It gave powers to the Secretary of State to extend exemption from the Factory and Workshop Act, 1901, to any factory or workshop in which he was satisfied that by reason of the loss of men through enlistment or transfer to Government service, or other circumstances arising out of the war, such exemption was necessary to enable the work to be carried on. Although in this case the power was vested in the Secretary of State (*i.e.*, Home Office), it is obvious that the department which was most concerned with the

---

[1] 8D. Any company, authority, or person supplying or authorised to supply water, light, heat, or power, shall, if so required by the Admiralty, Army Council or Air Council or the Minister of Munitions, supply water, light, heat, or power to any factory, building, camp, or other premises belonging to or used for the purposes of the Admiralty, Army Council or Air Council or the Minister of Munitions, and shall carry out such works and render such services as may be directed by the Admiralty, Army Council or Air Council or the Minister of Munitions for the purpose of enabling such a supply to be given either by themselves or by some other such company, authority, or person ;

Provided that a company, authority, or person shall not be required under this regulation to supply water, light, heat, or power to premises within the area of supply of any other company, authority, or person except with the concurrence of the appropriate Government Department, and if any question arises as to which Government Department is the appropriate Government Department the question shall be finally determined by the Treasury.

If any company, authority or person fail to comply with a requisition under this regulation the company, authority, or person shall be guilty of an offence against these regulations, and any director or officer of the company or officer of the authority who is knowingly a party to the default shall also be guilty of an offence against these regulations.

[2] 6A. The power of the Secretary of State under Section 150 of the Factory and Workshop Act, 1901, by order, to the extent and during the period named by him to exempt from that Act, in case of any public emergency, any factory or workshop belonging to the Crown or any factory or workshop in respect of work which is being done on behalf of the Crown, shall extend to any factory or workshop in which the Secretary of State is satisfied that by reason of the loss of men through enlistment or transference to Government service, or of other circumstances arising out of the present war, exemption is necessary to secure the carrying on of work, and that such exemption can be granted without detriment to the national interests.

regulation was the Ministry of Munitions, which had entered upon its legal existence the day before the regulation was issued. A similar case was that of Regulation 6B,[1] which enabled the Secretary of State to grant licences for the establishment of new or alteration of existing explosives factories without the assent of the local authority.

(*c*) Controlled Establishments.

The "controlled establishment" was one of the "novel creations of the first Munitions Act."[2] As the original scheme was framed it appeared to cover only private firms making munitions, but the 1916 Act included Government factories as controlled establishments. The Acts gave the Minister power to declare any establishment where war work was being done to be a controlled establishment.

"The effect, broadly speaking, of an establishment becoming controlled is that the State becomes a sort of statutory partner in the industrial concern." The owners of a controlled establishment "cease to be free to conduct their business in their own way, and the State shares in the profits." The Act gave the Minister sole discretion as to what establishments were to be controlled, and as the Amending Act very much expanded the meaning of munitions work, the bulk of the large firms engaged directly or indirectly upon war work were declared controlled by the Ministry during the war.

On the one hand a control order limited the profits of employers, on the other it suspended trade union practices or customs restricting output. The former aspect of the control order, however, lost its importance after 31 December, 1916, the Munitions Levy being merged by Sections 20 and 24 of the Finance Act, of 1917, in the general Excess Profits tax. In order to see that the provisions of the Act were observed the Minister had power to call for information as to the numbers and classes of workers and of machines, the nature of the work performed by them, the cost of production and the cost of materials, and to appoint inspectors. Heavy penalties punished the unauthorised use of information so communicated.

It should be noticed that the statutes made no provision for appeal against a control order—"What establishments should be controlled and when a controlling order should be made, were matters absolutely in the discretion of the Minister of Munitions," and the owner could not refuse to accept the order.

---

[1] 6B. The Secretary of State may grant licences for the establishment of new or the alteration of existing factories and magazines for gunpowder and other explosives intended for war purposes notwithstanding that the assent of the local authority to the grant of any such licence has not been obtained in accordance with the requirements of the Explosives Act, 1875, and any licence so granted shall, during the continuance of the present war, have the like effect as if such assent had been obtained in manner provided by that Act.

[2] T. A. Fyfe, *Employers and Workmen under the Munitions Acts.* 3rd edition, p. 56.

Under Regulation 2BB[1] the Ministry obtained power to vary the terms of sub-contracts made after 13 June, 1917, when it appeared that the rate of profit was unreasonable or excessive. It was found that under the existing system a manufacturer could, in some cases, evade control by sub-contracting, while in other cases principal contractors felt it a grievance that, whereas their own prices were subject to close control, no similar control was exercised over their sub-contractors' prices. The object of the regulation was achieved more by the existence of this power in reserve than by its actual use, though specific action was taken in a few cases.

---

[1] 2BB. Where the Admiralty, Army Council or Air Council or the Minister of Munitions have entered into a contract with any person (hereinafter referred to as " the principal contractor ") for the supply to them of any goods or services, and for the purposes of such contract a sub-contract has after the thirteenth day of June, nineteen hundred and seventeen, been made with any other person (whether such sub-contract is made with the principal contractor or any sub-contractor), and it appears to the Admiralty, Army Council or Air Council or the Minister of Munitions that the rate of profit earned or to be earned by the sub-contractor in respect of the sub-contract is unreasonable or excessive, the Admiralty, Army Council or Air Council or the Minister of Munitions may (whether or not the sub-contract has been completed) issue a certificate to that effect and may by order vary the terms of the sub-contract by the substitution therefor of such terms as they may think fair and reasonable, and require the sub-contractor—

(*a*) to carry out the sub-contract in whole or in part in accordance with the terms as so varied ; and

(*b*) either in addition thereto or as an alternative therefor to adjust the price of any goods already supplied or any services already rendered in accordance with the terms so varied, and to account to the other party to the sub-contract for any consequential reduction in price ;

Provided that no order made under this regulation shall affect the price of any goods supplied or services rendered under any sub-contract where the sub-contract has been completed and the payment has been made more than one year before the date of the order.

If any sub-contractor in respect of whom such an order is made fails to comply with any of the requirements contained in the order, he shall be guilty of an offence against these regulations :

Provided that if the sub-contractor does not agree to the terms fixed by the Admiralty, Army Council or Air Council or the Minister of Munitions, he may require the terms to be determined in the manner and in accordance with the principles prescribed by Regulation 2B, without prejudice however to his obligation in the meantime to comply with the terms of the order.

In the event of the Admiralty, Army Council or Air Council or the Minister of Munitions exercising the powers conferred upon them by this regulation, the price payable by them to the principal contractor under the principal contract shall be reduced by such an amount, not exceeding the amount of the saving to the principal contractor due to the exercise of such powers, as may be determined by the Admiralty, Army Council or Air Council or the Minister of Munitions.

This regulation shall apply where the Admiralty, Army Council or Air Council or the Minister of Munitions have required the occupier of any factory or workshop to place at their disposal the whole or any part of the output of the factory or workshop as if the occupier had contracted with the Admiralty, Army Council or Air Council or the Minister of Munitions to supply such output or part thereof at the price payable therefor as ascertained in accordance with Regulation 7.

(*d*) Investigations and Returns.

The Ministry's power of calling for returns and making investigations was exercised under Regulation 15c,[1] which enabled the Minister of Munitions, together with the Admiralty, Army Council and the Air Council, when it was subsequently formed, to require particulars as to the business of persons engaged in the production, manufacture, purchase, sale, distribution, transport, storage or shipment of any war material, food, forage or stores of any description, or of any article required for or in connection with the production thereof. This power formed a useful addition to the somewhat weaker powers under the Munitions of War Acts for the purpose of enabling the Department to make effective the system of cost investigation, which in its application to the purchase of Government stores is likely to remain as one of the most memorable and lasting of the changes introduced in the methods of Government Departments. The regulation further enabled a system of periodical returns in certain of the most important industries such as the steel industry, to be established, which proved of the greatest value in allocating and distributing output to the best advantage.

(*e*) Designs and Inventions.

Regulation 8c[2] (28 July, 1915) empowered the Minister to authorise a contractor holding a contract with the Ministry, or a sub-contractor, to use a registered design for the purposes of their contracts, without the consent of the registered proprietor, the question of compensation being settled, in default of agreement, either

---

[1] 15c. The Admiralty, Army Council or Air Council or the Minister of Munitions may by order require any person engaged in the production, manufacture, purchase, sale, distribution, transport, storage, or shipment of any war material, food, forage, or stores of any description or of any article required for or in connection with the production thereof to give such particulars as to his business as may be specified in the order, and may require any such particulars to be verified as they may direct, and if any person fails to comply with the order or with any requirement made thereunder, he shall be guilty of an offence against these regulations.

If any person, except as authorised by the Admiralty, Army Council or Air Council, or the Minister of Munitions, discloses or makes use of any information given to him under this regulation he shall be guilty of a summary offence against these regulations.

[2] 8c. It shall be lawful for the Admiralty, Army Council or Minister of Munitions to authorise or require any contractor holding a contract with the Admiralty, Army Council or Minister of Munitions or any sub-contractor, to use any registered design for the purposes of such contract, and thereupon the contractor or sub-contractor shall be entitled for the purposes aforesaid to use the registered design and to apply the same to any article in any class of goods in which the design is registered without the consent of the registered proprietor, and the consideration to be paid for the use of the registered design shall, in default of agreement between the proprietor of the design and the Admiralty, Army Council or Minister of Munitions, as the case may be, be determined, at the option of the Treasury, either in the manner in which other claims for compensation under these regulations are determined, or in the manner in which the consideration for the use of a patent is determined under section twenty-nine of the Patents and Designs Act, 1907.

by the Defence of the Realm Losses Commission, or under the Patents and Designs Act, 1907, at the option of the Treasury. One effect of this regulation was to do away with any delay which might be caused by a failure to come to terms with the proprietor of a design, with regard to its use for the purposes of a Ministry contract.

It was not until a year later (7 September, 1916) that Regulation 8cc[1] came into being, the particular movers in this case being the Admiralty. This regulation was of a somewhat unusual and drastic description, and was obviously one which was intended to operate more by its mere existence as a power held in reserve than by any extensive use of its provisions. It enabled the Minister to require any person to communicate all particulars in his possession of any invention, process or method of manufacture. So drastic, indeed, was this regulation felt to be that, so far as the Ministry of Munitions was concerned, assurances were given to important trade bodies that the powers which it conferred would not need to be exercised except in cases of real urgency and importance. The regulation was, however, on more than one occasion found to be of great use, as it enabled the Ministry to obtain details of certain valuable secret processes belonging to German firms, notwithstanding the existence of agreements entered into prior to the war, restraining their disclosure, and through the existence of this regulation the person making the disclosure received protection against any subsequent proceeding for breach of contract. With regard to the last paragraph of this regulation, relating to the right of an inventor to apply for a patent, it may be pointed out that it is open to question whether a provision of this character was within the powers conferred by the Defence of the Realm (Consolidation) Act, 1914. While, no doubt, the character of the regulation rendered a safeguard of this nature desirable, it is difficult to see how it could be held to be for the purpose of the defence of the realm.

---

[1] 8cc. It shall be lawful for the Admiralty, or Army Council or Minister of Munitions, with a view to the more efficient or increased production of war material, to require any person to communicate to a person nominated for that purpose by the Admiralty, Army Council or Minister of Munitions all such particulars as may be in his possession of any invention, or process or method of manufacture, or of any article manufactured or proposed to be manufactured, and to furnish drawings, models, or plans thereof, and to explain and demonstrate the same to such person, in all or any of its uses and workings; and if any person fails or neglects to comply with any such requirement he shall be guilty of an offence against these regulations; and if the requirement is addressed to a company, every director, manager, or officer of the company who fails or neglects to comply with such requirement shall also be guilty of an offence against these regulations.

If any person, except as authorised by the Admiralty or Army Council or Minister of Munitions, discloses or makes use of any information obtained in consequence of any requirement made under this regulation or communicated to him by the person by whom it was so obtained, he shall be guilty of an offence against these regulations.

No communication of an invention made in consequence of any requirement under this regulation, or the use thereof by any person authorised under this regulation to use it, shall prejudice any right of the inventor or owner thereof subsequently to apply for or obtain a patent for the invention.

VI. Powers relating to the Control of Labour.

The main powers exercised by the Minister of Munitions so far as they affected labour were conferred by the statutes known collectively as the Munitions of War Acts, 1915–1917. Of these the principal Act became law on 2 July, 1915, when the Ministry of Munitions had been in existence a little less than a month, and formed the basis of the widespread activities of the department in the sphere of labour. It is not proposed to deal with these Acts in detail, either as regards their origin or effects, as that has already been done exhaustively elsewhere,[1] but merely to summarise their effect upon the legal position of the Ministry.

The Act of 1915 is divided into three parts, the first of which provided for the settlement of differences as to wages, hours of work, or as to the terms or conditions of employment on the manufacture or repair of certain articles referred to as munitions work. It also provided for the settlement of such differences affecting employment on any other work to which this part of the Act was applied by proclamation. The method of settlement adopted was by reference to the Board of Trade, by whom the dispute could then be referred at the choice of the parties, either to the Committee on Production, a single arbitrator, or a court of arbitration. In order to give effect to this method of settlement, Section 2 prohibited strikes and lock-outs.

It was part of the arrangement made between the Government and the representatives of labour, that if the liberty of the workman was to be curtailed in order to secure increased output, restrictions should be imposed upon the profits which might accrue to the employer partly as a result of curtailment, and accordingly Section 4 (Part II of the Act) provided that establishments in which munitions work was carried on might be controlled. The effect of this was that in return for certain concessions in the way of the removal of trade union restrictions in such establishments a certain proportion of the profits were to revert to the Exchequer. This aspect of the arrangement, however, lost considerably in importance when the principle of excess profits was applied to all businesses.

Other important provisions in the Act were contained in Sections 6, 7, 10, and 15. Section 6 might be said to represent a compromise with the principle of compulsory service as applied to labour, and provided for a voluntary body of workmen, known as war munition volunteers, who bound themselves to be at the disposal of the Ministry for the purpose of such munitions work as might be considered to require their services. This gave to the Ministry a body of labour which might be moved about from place to place to meet requirements as and when they arose.

The system of leaving certificates, which was introduced by Section 7 was designed to maintain continuity of work and retain labour where it was most needed by taking away the workman's

[1] Vol. I, Parts II and IV; Vol. IV, Part II; Vol. VI, Part I.

right to leave his employer on any ground which seemed to him sufficient. This system was "a drastic interference with the liberty of the subject," which was naturally unpopular with the workmen, an unpopularity which the Amending Act of 1916 did little to mitigate, though practically all the more objectionable features were then removed. It was finally abolished, not by statutory enactment but by an Order made by the Minister (5 October, 1917) in virtue of power conferred on him by the Amending Act of 1917 (Section 2); but various safeguards were introduced, notably those providing for a week's notice and prohibiting transfer from munitions to private work, with a view to minimising dislocation of labour.

Section 8 empowered the Minister to make rules authorising the wearing of badges by persons engaged on munitions work and generally, together with Section 11, which gave power to require information from employers, constituted the legal authority for the activities of the Badge Department. When, however, the Military Service Acts came into force the certificate which accompanied the issue of a badge became a certificate of exemption in accordance with the provisions contained in Section 2 of the principal Military Service Act, 1916. Subsequently the scheme of issuing badges together with certificates was abolished and in its place there was substituted a system of administrative protection under the Schedule of Protected Occupations.

It has already been seen that the Minister had been given power under the Defence of the Realm Regulations 8A and 8B to make orders with the object of making the factory or workshop or plant or labour therein as useful as possible for the production of war material. The Act of 1915 considerably strengthened his position by the addition of words (Section 10, Part III) which enabled the Minister, the Admiralty and the Army Council to regulate or restrict the engagement or employment of any workman or class of workmen in any factory or workshop, thus making it possible for labour to be diverted from less essential occupations.

For the purpose of providing machinery to enforce the provisions of the Act, Section 15 provided for the institution of a new form of tribunal—the munitions tribunal, which consisted of an employer's representative and a workmen's representative with a neutral chairman. These tribunals were originally designed mainly to check bad time-keeping; in practice they dealt mainly with questions arising under Section 7 as amended by the Act of 1916. On the abolition of leaving certificates they dealt mainly with breaches of Section 3 of the Act of 1917, under which a workman's contract might not be terminated without a week's notice, and breaches of Section 9 of the same Act under which a workman might not be dismissed for having taken part in a trade dispute or because he was a member of a trade union. The institution of the tribunals was a remarkable experiment in emergency legislation and may be regarded as having proved successful, part of this success being attributed to the right of appeal to a judge of the High Court or of the Court of Sessions, which was introduced in the

Act of 1916 (Section 18 (3)). "The cardinal elements in all munitions tribunals proceedings were promptitude and finality, and it was expressly provided that appeals were to be heard and determined in a summary manner."[1]

Reference has already been made to the Amending Acts, 1916 and 1917. The first of these was primarily introduced to enable control to be extended to Government factories, but it dealt also with a number of other matters of great importance. Chief among them may be regarded the wide extension of the definition of "munitions work" (Section 9 (1) (*a*)). This enabled the Minister to apply the Munitions of War Acts to work in connection with railway wagons and locomotives, metals or any work certified by the Minister, the Board of Trade or the Admiralty as "necessary for the successful prosecution of the war," the work so certified relating to merchant vessels, explosives materials, materials for optical munitions, flax, jute, oil, motor spirit, and leather, the construction, alteration or repair of buildings, including houses for munition workers, the supply of light, heat, water, power, or tramway services. The practical effect of this comprehensive definition is that all work designed to aid in the successful prosecution of the war was munitions work or might be made so by order.

The Act also contained a number of provisions of importance directed towards the improvement of the system of leaving certificates with a view to the removal of working-class grievances, and to the extension of the powers and improvement of the munitions tribunals which, as they are dealt with in another part of this history,[2] are only referred to in passing. The Amending Act of 1917 was originally intended to apply dilution to private work, but in view of the opposition which this proposal encountered, mainly from one powerful trade union, the Amalgamated Society of Engineers, it was dropped, and the two main features of the Bill in the form in which it became law were the abolition of leaving certificates and the granting of power to the Minister to extend awards given to majorities of workers under Part I of the Principal Act to minorities.

Before passing from these Acts some reference should be made to the questions of wages and welfare. Wages were regulated in accordance with the Fair Wages clauses in Government contracts: (*a*) by the Committee on Production, who granted increases of wages to meet the increase in the cost of living; (*b*) by the decision of single arbitrators in the case of individual firms, under Part I of the Principal Act; and (*c*) generally by directions of the Minister. These directions of the Minister were given under various clauses. Under Clause 4, Section 2, of the 1915 Act the Minister had power to control changes in rates of wages in controlled establishments; under Clause 6 of the 1916 Act he was empowered to give directions as to the wages of women; under Clause 7 of the same Act he was able to regulate the wages of

[1] T. A. Fyfe, *Employers and Workmen under the Munitions Acts*. 3rd edition, p. 63.

[2] Vol. IV, Part II.

semi-skilled and unskilled men employed on skilled work; and under Clause 1 of the 1917 Act he was given power to give directions as to certain classes of workmen paid at time-rates.

Clauses 6 and 7 had, however, an importance beyond the question of wages, for they gave power to the Minister to make regulations as to hours of labour or conditions of employment in the case of female workers, and in the case of semi-skilled and unskilled men employed on skilled work, thereby facilitating the development of the welfare work of the Ministry of Munitions. This branch of the Ministry's activities, which implied a widespread system of intervention into conditions of labour, was undertaken primarily in the interests of efficiency. It was realised that as a matter of policy, if from no other motive, good conditions meant more effective work and increased output, and the activities of the Ministry extended to the supervision of lodging-houses, and even to the provision of places of worship, as at Gretna. In point of fact, the legal powers conferred by these clauses were never invoked, but they gave a specific legal sanction beyond that which might be read into the Ministry of Munitions Act and the Order in Council of 16 June, 1915.

The policy of the Welfare Section of the Ministry was not based on a series of coercive measures, and it was early laid down that it should be the deliberate policy of the section, with a view to obtaining permanent results, to educate rather than to compel. It was found necessary, however, to issue certain rules for the purpose of safeguarding the health of munition workers engaged on work in connection with explosives, especially T.N.T. under Regulation 35AA[1] of the Defence of the Realm Regulations (22 December, 1916), which empowered the Ministry to make health rules for factories and other places where explosives were manufactured, stored, or handled; in particular, rules requiring the provision of medical attendance, special food and clothing.

Clause 4 of the Munitions of War (Amendment) Act, 1917, "extended" Clause 6 of the 1916 Act to "female workers employed on or in connection with munitions work in establishments of all classes," though in point of fact this extension was hardly appreciable in its scope as the section applied to all women workers to whom the provisions of Clause 7 of the principal Act with regard to leaving certificates applied.

---

[1] 35AA. It shall be lawful for the Admiralty, Army Council or Air Council or the Minister of Munitions, with the concurrence of a Secretary of State, to make and apply to any factory or other premises in or upon which any explosive substance or any substance required for the production thereof is manufactured, treated, produced, stored, or in any way used or handled, rules with a view to securing the health of all or any of the persons managing, or employed or being in or about such premises, and in particular rules requiring any occupier of such premises to provide any form of medical attendance, whether on the premises or otherwise, nourishment, clothing ventilation, or other sanitary arrangements, or to provide and use or to refrain from using any machinery, appliance, method, or process, and by such rules to impose duties on the persons managing, or employed or being in or about such premises.

Any person who contravenes or fails to comply with any such rule shall be guilty of a summary offence against these regulations.

A regulation of considerable importance, both as regards its effect and the strong feeling which the exercise of the powers thereby conferred evoked, was Regulation 14[1] (28 November, 1914, amended on various occasions). This enabled the competent naval or military authority, with the consent of the Admiralty or Army Council, to remove suspected persons from specified areas and to prohibit them entering or residing in such areas. Its importance from the point of view of the Ministry of Munitions lies in the fact that it was used, at the instance of the Ministry, for the purpose of deporting undesirable persons engaged in fomenting labour troubles, and a particular instance of its application for this purpose will be found in the case of the deporting of certain agitators from the Clyde.[2] Further, on 30 November, 1915, the amendment of Regulation 42[3] made it an offence to attempt to impede the production of munitions of war.[4]

It will be seen from the foregoing survey that the Minister was vested with wide powers and responsibilities in the field of labour. By controlling establishments in which munitions were manufactured, he was in a position to suspend trade union practices, thereby making possible the dilution of labour, and to provide for the enforcement of discipline by means of the munitions tribunals. By the institution

---

[1] 14. Where a person is suspected of acting, or of having acted, or of being about to act in a manner prejudicial to the public safety or the defence of the realm and it appears to the competent naval or military authority that it is desirable that such person should be prohibited from residing in or entering any locality, the competent naval or military authority may by order prohibit him from residing in or entering any area or areas which may be specified in the order and upon the making of such an order the person to whom the order relates shall, if he resides in any specified area, leave that area within such time as may be specified by the order, and shall not subsequently reside in or enter any area specified in the order, and if he does so, he shall be guilty of an offence against these regulations. Provided that if the person with respect to whom it is proposed to make such an order as aforesaid undertakes to comply with such conditions as to reporting to the police, restriction on movements, or otherwise as may be imposed on him, the order may, instead, of requiring him to cease to reside in any locality, authorise him to continue to reside therein if he complies with such conditions as to the matters aforesaid as may be specified in the order, and if any person in respect of whom such an order is made fails to comply with any such conditions he shall be guilty of an offence against these regulations.

Any such order may further require the person to whom the order relates to report for approval his proposed place of residence to the competent naval or military authority and to proceed thereto and report his arrival to the police within such time as may be specified in the order, and not subsequently to change his place of residence without leave of the competent naval or military authority, and in such case if he fails to comply with the requirements of the order he shall be guilty of an offence against these regulations.

If any person remains in or enters any area in contravention of an order under this regulation he may be removed therefrom by the direction of the competent naval or military authority.

[2] See Vol. IV, Part IV, Chap. VI, Section XI.

[3] 42. If any person attempts to cause mutiny, sedition or disaffection among any of His Majesty's Forces or among the civilian population, or to impede, delay or restrict the production, repair or transport of war material or any other work necessary for the successful prosecution of the war, he shall be guilty of an offence against these regulations.

[4] See Vol. IV, Part IV, Chap. VI, p. 112.

of the system of war munitions volunteers he was placed in possession of a mobile body of labour which could be allocated to meet pressing needs. Further, by the system of leaving certificates, he could regulate the movement of labour and by prohibiting the employment of labour put a stop, within certain limits, to private non-essential work.

One thing, however, which the Munitions of War Acts did not achieve was the prevention of strikes. It was possible by the imposition of fines to prevent a lock-out, but this did not apply to strikes, as the history of the years of war has shown. The most that was achieved in this direction was the prevention of small and petty strikes, and great as was the effect of the Acts in other respects, in this particular, at all events, they must be accounted to have failed.

Ancillary to the general control of labour was the policy of regulating the sale of liquor in munitions areas. Under Regulation 10[1] the competent naval or military authority had power in certain specified areas to close licensed premises and to prohibit treating. The Defence of the Realm (Amendment) No. 3 Act, 1915,[2] provided for the State control of the liquor trade in any area specified by Order in Council as one in which such control was expedient for the purpose of the successful prosecution of the war. The area must be one in which war material was being made, loaded, unloaded or dealt with in transit, or in which troops were assembled. This Act was passed in May, 1915, to meet the serious situation which was arising in certain shipyards and other works owing to loss of time by workmen on account of drink.

Not only was vital work from this cause greatly delayed but grave danger was apprehended from the work actually done being of so inferior a character as to render it unsafe for the purposes for which it was intended. The issue of regulations was authorised by the Act which were to take effect when applied by Order in Council to specified areas.

---

[1] 10. The competent naval or military authority or the Minister of Munitions may by order :—

(1) require all or any licensed premises within any area specified in the order to be closed, either altogether, or subject to such exceptions as to hours and purposes, and to compliance with such directions, as may be specified in the order ;

(2) make such provisions as he thinks necessary for the prevention of the practice of treating in any licensed premises within any area specified in the order.

Any order of the competent naval or military authority or the Minister of Munitions under this regulation may be made to apply either generally or as respects all or any members of His Majesty's Forces, or of the Forces of any of His Majesty's Allies, mentioned in the order, and may require copies of the order to be exhibited in a prominent place in any licensed premises affected thereby.

If any person contravenes or fails to comply with any of the provisions of an order made under this regulation or any conditions or restrictions imposed thereby, he shall be guilty of an offence against these regulations, and the competent naval or military authority or the Minister of Munitions may cause such steps to be taken as may be necessary to enforce compliance with the order.

In this regulation the expression " licensed premises " includes any premises or place where the sale of intoxicating liquor is carried on under a licence.

[2] Appendix XIII.

The Act provided for a prescribed Government authority which should be charged with the general administration of the Act, and accordingly the regulations issued on 10 June, 1915, provided for the appointment of a Central Control (Liquor Traffic) Board, consisting of a Chairman and such persons as the Minister of Munitions might from time to time appoint. The Minister of Munitions, who thus became the Minister responsible for the administration of the Act, had entered on his legal existence a day previous to the issue of the regulations, the Bill constituting his office having been introduced after the Defence of the Realm (Amendment) No. 3 Act had already become law.

The Board had wide powers. It could close or regulate any licensed premises or club where liquor was sold, it could regulate the introduction of liquor into the area and prohibit treating. Further it was empowered to prohibit the sale of liquor except by the Board, to acquire licensed or other premises and provide refreshment rooms and rooms for entertainment and recreation without obtaining licenses. Various areas were scheduled under these orders. On 6 July, 10 areas in England and Wales—the North-East Coast, Liverpool, Bristol, Southampton, Cardiff, Barry, Newport, Newhaven, Barrow-in-Furness, and an area in Kent were scheduled ; on 28 July two large areas in Scotland were added, and a third on 14 September.

In all the orders made under these regulations the Central Control Board adopted the policy of restricting the hours in which the sale and supply of intoxicating liquors were allowed.

Regulations 9B[1] (8 June, 1916), 9D[2] (18 August, 1916) and

---

[1] 9B. It shall not be lawful to hold any race meeting, that is to say any meeting at which racing with horses, galloways or ponies which is open to the public, whether on payment or otherwise, takes place ; and if an attempt is made to hold a race meeting in contravention of this regulation it shall be lawful to take such steps as may be necessary to prevent the holding thereof ; and if any person takes part in the control, management, or organisation of any such meeting, or allows any horse, galloway or pony to run at such meeting, or brings any horse, galloway, or pony to a place where any such meeting is proposed to be held for the purpose of taking part in a race, he shall be guilty of a summary offence against these regulations.

Provided that nothing in this regulation shall apply to a race meeting held in Great Britain under the authority of the Stewards of the Jockey Club or the National Hunt Committee in pursuance of any scheme or programme of racing sanctioned by the Board of Trade in consultation with the Army Council, or a race meeting held in Ireland in pursuance of any arrangements made by the Lord Lieutenant with the Irish Turf Club.

[2] 9D. Where there is reason to apprehend that the holding of any fair will impede or delay the production, repair, or transport of war material or of any work necessary for the successful prosecution of the war, it shall be lawful for the Minister of Munitions to make an order prohibiting the holding of the fair, and if the fair is attempted to be held in contravention of any such prohibition it shall be lawful to take such steps as may be necessary to prevent the holding thereof.

If any person takes part in the control, management, or organisation of any fair which is prohibited under this regulation, or of any stall, show, or other place of business or entertainment thereat, he shall be guilty of a summary offence against these regulations.

9BB[1] (24 January, 1917), gave powers to the Minister to prohibit race meetings, fairs, and coursing, whippet racing or similar sports when the holding was likely to interfere with the production or transport of munitions. The object of these regulations was mainly to remove one cause of labour absenting itself from the works. In this connection, reference might also be made to Regulation 10C[2] (22 December, 1916), which gave power to the Minister to close places of public entertainment, if they were prejudicial to the production of war material.

VII. Powers relating to Housing.

The Order in Council of 16 June, 1915, gave powers to the Minister of Munitions to take possession of unoccupied premises for the housing of munition workers. This was done by giving him concurrent powers in Regulation 1 of the Order in Council, amending the Defence of the Realm (Consolidation) Regulations, 1914 (23 March, 1915). This regulation, which became 2A[3] of the Consolidated Regulations, was not, however, found adequate to deal with the situation which arose in certain areas, owing to the acute shortage of housing accommodation, consequent on the erection of new factories or extension of existing ones, in view of the ever-expanding munitions programme.

---

[1] 9BB. Where there is reason to apprehend that the holding of any meeting for the purpose of hare or rabbit coursing, whippet racing or other similar recreation will impede or delay the production, repair, or transport of war material or of any work necessary for the successful prosecution of the war, it shall be lawful for the Minister of Munitions to make an order either prohibiting the holding of the meeting, or permitting the holding thereof subject to such conditions as may be specified in the order, and if the meeting is attempted to be held in contravention of any such prohibition or conditions, it shall be lawful to take such steps as may be necessary to prevent the holding thereof.

If any person takes part in the control, management or organisation of any meeting which is prohibited under this regulation, or allows any dog to run at any such meeting, or brings any dog to a place where such a meeting is proposed to be held for the purpose of taking part in the meeting, or fails to comply with any such conditions as aforesaid, he shall be guilty of a summary offence against these regulations.

[2] 10C. Where it appears to the Admiralty, Army Council or Air Council or to the Minister of Munitions that the use of any premises or place (whether licensed for the purpose or not) for public singing, dancing, music, or other public entertainment of the like kind, is prejudicial to the discipline of any members of His Majesty's Forces, or to the production of war material, the Admiralty, Army Council or Air Council or the Minister of Munitions (as the case may be) may by order require the premises or place to be closed for those purposes, either altogether, or subject to such conditions as to hours and purposes or otherwise as may be specified in the order.

If the occupier of any such premises or place or any other person contravenes or fails to comply with any of the provisions of an order made under this regulation or any conditions or restrictions imposed thereby, he shall be guilty of a summary offence against these regulations, and the competent naval or military authority or the Minister of Munitions may cause such steps to be taken as may be necessary to enforce compliance with the order.

[3] 2A. It shall be lawful for the Admiralty or Army Council or the Minister of Munitions to take possession of any unoccupied premises for the purpose of housing workmen employed in the production, storage, or transport of war material.

The Billeting of Civilians Act, the administration of which was entrusted to a Central Billeting Board constituted by the Ministry, was designed to meet this difficulty. The accession to the ordinary population in munitions districts resulted in a shortage of housing accommodation and a rise in rents charged by landlords to lodgers who were not protected under the Rent and Mortgage (War Restriction) Act, 1915. The function of the Central Billeting Board was to enquire into the necessity of providing billets for munition workers in any locality where, on the certificate of a Government Department, the carrying on of work of national importance necessitated the provision of accommodation for the persons employed in such work. In the event of the Board being satisfied, as a result of enquiry, that the circumstances were such as to require the application of the Act, they appointed a local committee for the purpose of taking such action as might be necessary in order to provide accommodation and to allocate the persons who were to be billeted. The local committees were also responsible for the general administration of the Act in their area, which involved such questions as the fixing of the scales of payment and the hearing of complaints, in respect of which there was granted a right of appeal from the local committee to the Central Billeting Board.

In addition to the Ministry of Munitions there were also represented on the Central Billeting Board the Admiralty, the War Office, the Ministry of Labour, Board of Agriculture, Local Government Board, Scottish Office, and the Ministry of National Service. The secretary of the Board was an officer of the Ministry of Munitions, and the Minister was given power to appoint such other persons, in addition to the representatives of the departments, as he should consider necessary. By means of this emergency Act the Central Billeting Board, working through the local committees, was given extensive powers over the rights and liberties of individuals, of a character somewhat analogous to those exercised by the War Office in billeting troops ; it was in a position to compel a householder to provide accommodation in any area in which the Act was in operation, while at the same time safeguarding the householder against undesirable persons who might be billeted upon him.

The Billeting Act, however, did not apply to the families of munition workers, and owing to the rapid expansion of munitions production the housing problem was extremely serious. In some districts advantage was being taken of the shortage by various persons, including persons of foreign nationality, to purchase houses and then to proceed to eject the inhabitants, with the result that in certain areas, notably in Barrow-in-Furness, ejectment proceedings against munition workers and their families were of frequent occurrence and caused serious discontent and even rioting. In order to meet this difficulty the Ministry, at the urgent instance of local authorities, took power to forbid any person in certain defined areas to take or cause to be taken, without the permission of the Minister of Munitions, any proceedings for recovery or obtaining possession of any dwelling house or premises

in which a workman employed on munitions work was living. This was embodied in an Amendment to Regulation 2A (2A (2)[1] 29 September, 1917), which enabled the Minister to declare any area in which war material was being manufactured, produced, repaired, stored, or transported, a special area for the purposes of the regulation.

The validity of this regulation, which proved of considerable utility, does not appear to have been questioned during the war. On an appeal, however, from a magistrate's decision, a King's Bench Divisional Court held in the case of Chester *v.* Bateson (29 January, 1920)—a case in which the Ministry was not represented and in which no argument was heard in support of the validity of the regulation—that the regulation in question was *ultra vires* the Defence of the Realm Consolidation Act. The Court took the view that a regulation which closed the King's Courts to his subjects was beyond the powers intended to be conferred by Parliament.[2]

In Mr. Justice Darling's words :—

> " The regulation as framed forbids the owner of the property access to all legal tribunals in this matter. So grave an invasion of the rights of all subjects was not intended by the legislature to be accomplished by a Departmental Order such as this one of the Ministry of Munitions . . . . In stress of war we may rightly be obliged, as we should be ready, to forgo much of our liberty, but I hold that this elemental right of the subject of the British Crown cannot thus easily be taken from him."

Mr. Justice Sankey took the same view :—

> " It was not competent for His Majesty in Council to make a regulation enacting that a man who seeks the assistance or the protection of the King's Courts should be exposed to fine and imprisonment for having done so."

---

[1] (2) If as respects any area in which the work of manufacturing, producing, repairing, storing, or transporting war material is being carried on, the Minister of Munitions is of opinion that the ejectment from their dwellings of workmen employed in that work is calculated to impede, delay, or restrict that work, he may by order declare the area to be a special area for the purpose of this regulation.

Whilst the order remains in force no person shall, without the consent of the Minister of Munitions, take, or cause to be taken, any proceedings for the purpose of obtaining an order or decree for the recovery of possession of, or for the ejectment of a tenant of, any dwelling house or other premises situate in the special area, being a house or premises in which any workman so employed is living, so long as the tenant continues duly to pay the rent and to observe the other conditions of the tenancy, other than any condition for the delivery up of possession.

If any person acts in contravention of this regulation he shall be guilty of a summary offence against these regulations.

[2] See *Times Law Report*, 29 January, in *The Times* of 30 January, 1920.

VIII. Miscellaneous Powers.

(*a*) CENSORSHIP.

Among the miscellaneous powers exercised by the Ministry of Munitions were his censorship powers under Regulation 18,[1] which forbade the publishing or communicating of information relating to naval or military matters or to war material.

By means of this regulation the Ministry of Munitions exercised an indirect censorship over the press and over the publication of books, when the matter dealt with might be held to come under this classification. Action was, in fact, taken by the Press Bureau, but only after consultation with the Ministry of Munitions, to which large numbers of intended publications were submitted. This censorship extended to advertisements and even to trade or other directories, when there was any possibility that the information proposed to be conveyed with regard to business addresses or the class of manufacture carried on at particular works might be of use to the enemy.

(*b*) PREVENTION OF FRAUDULENT MANUFACTURE.

Legal powers to punish fraudulent or careless manufacture were given by Regulations 45 (*h*) (27 June, 1916) and 42D (19 May, 1917), which related to the committing of certain offences with regard to matters which largely, though not exclusively, concerned the Ministry of Munitions. The first of these regulations, 45 (*h*),[2] declared it an

[1] 18. No person shall without lawful authority collect, record, publish or communicate, or attempt to elicit, any information with respect to the movement, numbers, description, condition, or disposition of any of the forces, ships, or aircraft of His Majesty or any of His Majesty's Allies, or with respect to the plans or conduct, or supposed plans or conduct, of any naval or military operations by any such forces, ships, or aircraft, or with respect to the supply, description, condition, transport, or manufacture or storage or place or intended place of manufacture or storage, of war material, or with respect to any works or measures undertaken for or connected with, or intended for the fortification or defence of any place, or any information of such a nature as is calculated to be or might be directly or indirectly useful to the enemy, and if any person contravenes the provisions of this regulation, or without lawful authority or excuse has in his possession any document containing any such information as aforesaid, he shall be guilty of an offence against these regulations.

No person shall without lawful authority publish or communicate any information relating to the passage of any ship along any part of the coast of the United Kingdom, and if any person publishes or communicates any such information in contravention of this provision he shall be guilty of an offence against these regulations.

For the purposes of this regulation the expression "ships of His Majesty or of any of His Majesty's Allies" includes ships engaged in the service of His Majesty or of any of His Majesty's Allies.

[2] 45. If any person—

* * * * * *

(*h*) makes any statement or does any act intended or calculated to mislead or deceive any person in the employment of or acting for or on behalf of His Majesty or any Government Department, or the Government of any of His Majesty's Dominions or the Government of any Allied State as to the quantity or quality of any war material or other goods, or otherwise in relation to the manufacture, testing or supply thereof, or with the like intent withholds any information in his possession,

* * * * * *

he shall be guilty of an offence against these regulations.

offence to make any statement or do any act calculated to mislead or deceive the representatives of the Government, or of the Dominions or of Allied Governments, as to the quantity or quality of war material in relation to manufacture, testing or supply. This measure was necessary in order to afford an effective means of dealing with the serious offence of doping materials or goods to be submitted for Government test, so as to deceive the inspector, thus enabling war material of an inferior quality to be passed as equal to specification. A number of successful prosecutions took place under this regulation, which proved a great deterrent to fraudulent dealings by contractors. It was introduced at the instance of the Ministry of Munitions, owing to the discovery of certain serious offences of this character in relation to the manufacture of steel and to the doubt which existed as to whether the ordinary criminal law went far enough to deal with this class of offence. Regulation 42D[1] made it an offence to commit any act liable to render war material ineffective or dangerous, and was aimed primarily at cases of sabotage, though it was found to be a useful adjunct to Regulation 45 (*h*) in cases where contractors endeavoured to pass off inferior goods or goods not complying with specification.

(*c*) The Munitions (Liability for Explosions) Act, 1916.

The question of liability for explosions at munitions works, as a result of which damage had been done to third parties, had been the subject of considerable discussion, the firms affected holding the Government liable, whereas the Government had been reluctant to assume liability. In consequence of this and as a result of the unwillingness of insurance companies to cover risks of this character, the Munitions (Liability for Explosions) Bill was introduced. In moving the second reading of the Bill[2] Mr. Kellaway, after referring to the differences of opinion between the Government and firms affected, whereby the payment of compensation to third parties was delayed, went on to say :—

> "The sufferers were not responsible, and they were entitled to compensation for loss or injury arising out of the operations carried on either directly by the Government or for the purposes of the Government. But it did not appear, and I think the House will agree, that the whole of the responsibility ought to be taken over by the Government in those cases where the contractors had a right to cover a risk of this kind, and this Bill is brought in to enable the Government to assume the

[1] 42D. If any person commits any act in connection with any war materials likely to render such war material wholly or partially ineffective or to cause danger or increased danger to any person working upon, handling, or using the same, or if any person engaged in the manufacture, treatment, assembling, transport, or storage of war material wilfully, or in contravention of any order or instruction given to him in the course of his employment, omits to do anything to or in connection with any war material the omission whereof is likely to render such war material wholly or partially ineffective, or to cause danger or increased danger to any person working upon, handling, or using the same, he shall be guilty of an offence against these regulations.

[2] *Parliamentary Debates* (1916), *H. of C.*, LXXXVIII, 987.

whole liability, and thus remove any question as to whether it rests with the firm or with the Government, and in that case the Government ought to have power to take from the firm the required payment from the firm for a premium to cover part of the liability."

The Bill became law on 22 December, 1916. The effect of this measure was that the Ministry, in addition to its other functions, undertook the business of an insurance company. By the terms of the Act the Ministry was empowered to apply a compulsory scheme to persons manufacturing or dealing with munitions, which expression included the handling or storing of munitions, whereby the Government assumed liability for damage caused by explosion and exacted a premium from the persons whose liabilities were assumed. An advisory committee was appointed to advise as regards contributions under the scheme and disputes were referred to this Committee. The munitions to which the Act was applied covered "ammunition or mines for naval or military purposes and any component part of any such ammunition or mines and any explosives for any such ammunition or mines."

IX. Control of the Demobilisation of Industry.

A survey of the powers and duties of the Minister of Munitions would not be complete without some reference to the post-war activities of the Ministry. The work of the Ministry could not be brought to a conclusion with the conclusion of hostilities. The control exercised by the Ministry in the sphere of industry could not at once be relaxed, but required to be maintained for the purpose of the reversion from war to peace production. It was doubtful, however, whether the powers conferred by the Ministry of Munitions Act, 1915, could be utilised for this purpose. Accordingly, a Bill, the Ministry of Munitions Bill, 1918, was introduced to provide a remedy and to confer such powers upon the Minister of Munitions as would place his activities in the sphere of demobilisation upon a footing of undoubted legality.

The Bill consisted, for practical purposes, of one clause :—

"The purposes of the Ministry of Munitions shall include the supervision and regulation of the diversion to the production of articles required in times of peace, of industries established or utilised during the present war for the purpose of the production of war material, and all powers which may be exercised by the Minister of Munitions with a view to facilitating the supply of war material or otherwise for promoting the prosecution of the present war may be exercised by him with a view to securing that such diversion as aforesaid shall be carried into effect in such a manner as may be most conducive to the national interests, and all orders, requirements, directions, regulations, rules and notices made or given by the Minister and in force

at the passing of this Act shall, until they expire or are altered or revoked, continue in force as if this Act had been in force at the time when they were made or given."

In his speech on the second reading,[1] Mr. Kellaway pointed out that, so far as concerned certain raw materials and articles, the demand for peace production would exceed the supply, and accordingly it was necessary that they should be diverted to peace purposes of a kind which would be in the permanent interest of the country. The sudden cessation of control would, moreover, result in a rise of prices, and industry would be at the mercy of a few fortunate individuals who had at their disposal a very limited supply of certain essential materials.

Some anxiety was felt in the House as to the scope of the Bill. It was feared that it aimed at or would result in a prolongation of the life of the Ministry or an extension of its powers. It was also felt that such powers as the Bill conferred should be limited to a period of six months. A careful perusal of Clause I, however, shows that no such prolongation or extension was contemplated. If the duration of the powers actually conferred had been limited to six months, at the end of such period the Ministry would have reverted to its war powers and would have been unable to direct transfer of industry from war production to peace production. "There is no extension of powers," Mr. Kellaway declared. "What it says is that the powers now possessed may be used for a different purpose."[2]

In view of the assurances given by the Government the Bill passed through the committee stage and third reading and became law on 21 November, 1918.

Under the powers given by this Act the Ministry superintended the gradual change over of industry from war to peace production and was enabled to relax control over raw materials and essential articles by degrees and to liquidate the large stocks of various materials of which, as has been already pointed out, it became the owner under the Defence of the Realm Regulations.

Apart from raw materials there were, however, vast quantities of goods of all descriptions, as well as factories and buildings, which were no longer required for the purposes for which they were originally used or destined to be used. This applied not merely to the Ministry of Munitions alone, but in a greater or a lesser degree to all Departments of State. It was, of course, apparent that co-ordination and uniformity of practice in disposing of such property as was surplus to requirements was desirable and indeed necessary, and accordingly the Government decided to assign to the Minister of Munitions the duty of disposing of all surplus Government stores, whether in the possession of the Ministry or of some other department.

---

[1] *Parliamentary Debates* (1916), *H. of C.*, CX, 3,375–8.

[2] *Ibid.*, 3,387.

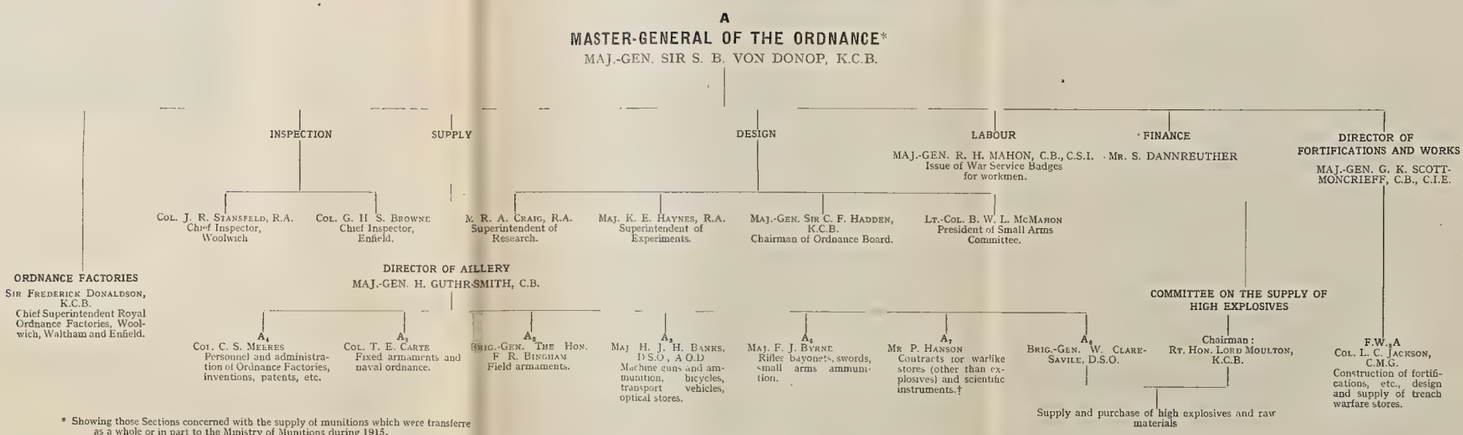
In order to carry this decision into effect, the powers of an existing organisation known as the Surplus Government Property Disposal Board were transferred to the Ministry, upon which devolved the duty of disposing of all Government property, as and when such property was declared by the departments concerned to be surplus to their requirements.

APPENDICES

APPENDIX I.

Departmental Organisation on 1 June, 1915.

I.—Munitions Supply Organisation under the War Office.

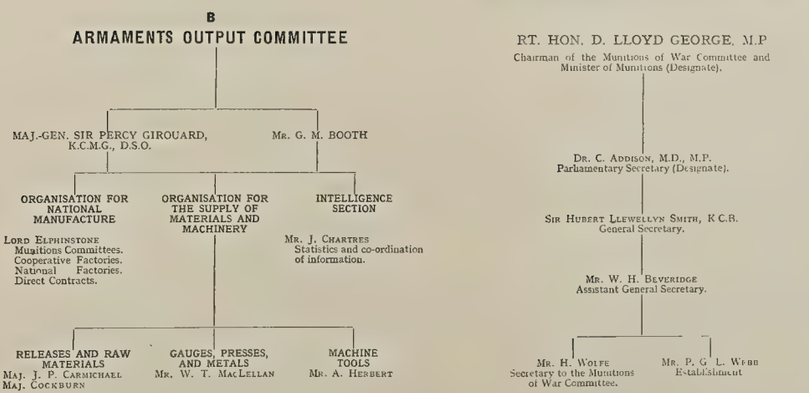


* Showing those Sections concerned with the supply of munitions which were transferred as a whole or in part to the Ministry of Munitions during 1915.

† Contracts for metals, machinery and mechanical transport vehicles were dealt with by Contracts, under the Quartermaster-General.

(4271)

II.—Organisation at 6, Whitehall Gardens.



242

APPENDIX II.

Departmental Organisation on 1 July, 1915.

MINISTER OF MUNITIONS

RT. HON. D. LLOYD GEORGE, M.P.

GENERAL SECRETARY
SIR HUBERT LLEWELLYN SMITH, K.C.B.

PARLIAMENTARY SECRETARY
DR. C. ADDISON, M.P.

PARLIAMENTARY MILITARY SECRETARY
MAJ.-GEN. IVOR PHILIPPS, D.S.O., M.P.

SECRETARIAT AND LABOUR

MR. W. H. BEVERIDGE
Assistant General Secretary

- MR. C. F. REY — Director of Munition Workers' Enrolment.
- MR. H. E. MORGAN — Supply of Labour. War Munition Volunteers.
- MR. T. R. JOHNSON — Release of Volunteers.
- MAJ. F. J. SCOTT — Release from the Colours.
- MR. D. O. MALCOLM — War Service Badges. Limitation of Recruiting. Relations with other Government Departments. Defence of the Realm Act.
- MR. OWEN SMITH — Limitation of profits.
- MR. H. WOLFE — Legislation. Controlled Establishments. Munitions Tribunals. General labour questions. Leaving certificates. Works rules.
- MR. P. G. L. WEBB — Establishment.
- MR. G. MACEY — Finance.

MUNITIONS SUPPLY

MAJ.-GEN. SIR PERCY GIROUARD, K.C.M.G., D.S.O.
Director-General

- CAPT. F. H. BROWNING — Staff Organisation
- PROF. ADAMS, PROF. GELDART — Advisers on Labour
- CAPT. VAUX — Liaison Officer with Woolwich
- DR. R. T. GLAZEBROOK, C.B. — National Physical Laboratory

- MR. G. H. WEST — Deputy Director-General (A)
  - LT.-COMNDR. J. WEDGWOOD, M.P. — Technical Supervision of National Shell Factories and gun ammunition contracts.
  - MR. L. W. LLEWELYN — Raw materials.
  - MR. H. FOWLER — Equipment of National Factories. Shell production. Machine tools.
- MR. G. M. BOOTH — Deputy Director-General (B)
  - MR. J. STEVENSON — Area organisation. Foreign orders.
  - MR. J. CHARTRES — Intelligence and record. Correspondence connected with labour.
  - MR. W. T. LAYTON — Statistics.
- MR. E. C. GEDDES — Deputy Director-General (C)
  - MR. E. W. MOIR — Machine guns, etc.
  - MR. F. T. HOPKINSON — Small arms ammunition.
  - MR. G. M. BROWN — Rifles.
  - MAJ. W. C. SYMON — Guns and equipment. Ammunition wagons. Optical munitions.
  - MR. D. BAIN — Horse-drawn transport vehicles.
- MR. P. HANSON — Director, Contracts.
- MR. S. DANNREUTHER — Finance.

EXPLOSIVES SUPPLY

RT. HON. LORD MOULTON, K.C.B.
Director-General

- BRIG.-GEN. CLARE SAVILLE, D.S.O. — Military Adviser
- LIEUT. A. CORBETT — Legal Adviser
- DR. R. C. FARMER — Chemical Adviser

SIR R. SOTHERN HOLLAND
Deputy Director-General

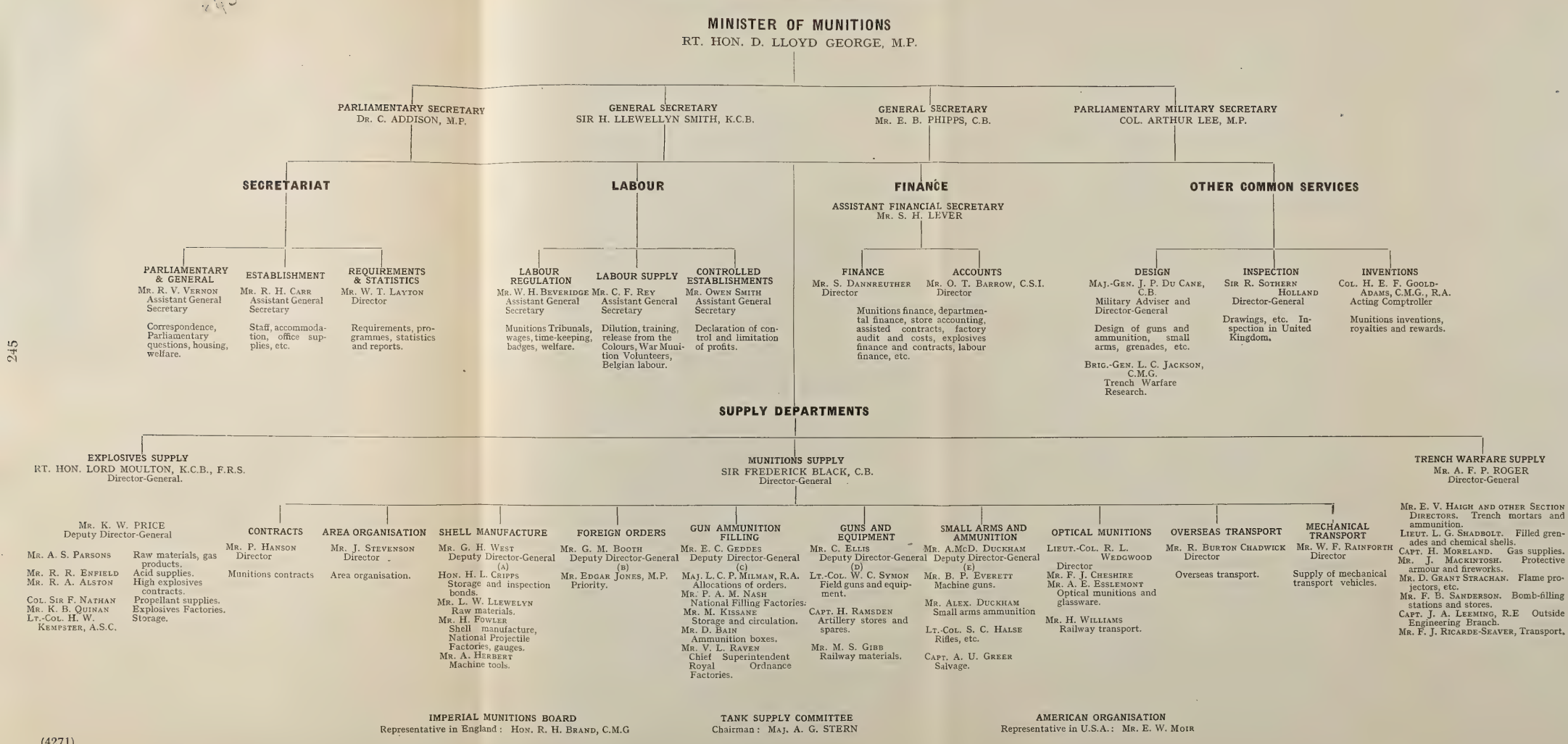
- MR. K. W. PRICE — Raw materials. Acid supplies. Toluol.
- MAJ. HON. W. L. BAGOT, D.S.O. — Propellant supplies. Wood Distillation Factories.
- MR. H. ROSS SKINNER — High Explosives contracts.
- MR. K. B. QUINAN — Factory construction.
- MR. A. E. TAYLOR — Establishment.
- MR. F. J. HOWARD — Finance.

ENGINEER MUNITIONS DEPARTMENT

BRIG.-GEN. L. C. JACKSON, C.M.G
Director

- MR. A. F. P. ROGER — Adviser on Finance and Supply
- LT.-COL. J. C. MATHESON, R.E. — Assistant Director
  - CAPT. E. T. RICHMOND — Grenades.
  - CAPT. H. MORELAND — Cylinders & Gas.
  - CAPT. G. H. WICKS — Bomb-throwers.
  - LT. J. A. LEEMING, R.E. — Outside Engineering Branch.
  - MR. H. T. PHILLIPS — Contracts.
  - CAPT. C. H. LEY, R.E. — Staff.

Departmental Organisation on 1 July, 1916.



APPENDIX IV.

Departmental Organisation on 1 July, 1917.

MINISTER OF MUNITIONS

RT. HON. C. ADDISON, M.D., M.P.

ADVISORY COMMITTEE
Chairman—Sir Arthur Duckham, K.C.B.
Vice-Chairman—Sir James Stevenson, Bt.

RECONSTRUCTION COMMITTEE
Chairman—Sir Arthur Duckham, K.C.B.

GENERAL SECRETARY
Mr. E. B. Phipps, C.B.

PARLIAMENTARY SECRETARY
Sir L. Worthington Evans, Bt., M.P.

PARLIAMENTARY SECRETARY
Mr. F. G. Kellaway, M.P.

SECRETARIAT

PARLIAMENTARY AND GENERAL
Mr. R. V. Vernon
Assistant General Secretary
Correspondence, Parliamentary questions, housing, etc.

ESTABLISHMENT
Mr. R. H. Carr
Assistant General Secretary
Staff, accommodation, office supplies, etc.

SPECIAL INTELLIGENCE
Sir Hedley Le Bas
Director
Publicity arrangements

REQUIREMENTS AND STATISTICS
Mr. W. T. Layton
Director
Requirements, programmes, statistics and reports.

LABOUR

LABOUR REGULATION
Mr. H. Wolfe
Assistant General Secretary
Munitions Tribunals, wages, disputes, time-keeping, welfare, etc.

LABOUR SUPPLY
Sir Stephenson Kent, K.C.B.
Director-General
Dilution and allocation, War Munition Volunteers, release from the Colours, badges, enlistment complaints, training, etc.

FINANCE

ASSISTANT FINANCIAL SECRETARY
Mr. J. Mann

CONSTRUCTION FINANCE
Mr. F. E. Palmer, C.I.E.
Director-General
Munitions Works Board, survey and valuation, assisted contracts.

MUNITIONS FINANCE
Mr. S. Dannreuther, C.B.
Director-General
Munitions finance, departmental finance, stores accounting, assisted contracts, factory audit and costs, explosives finance and contracts, labour finance, internal audit, etc

OTHER COMMON SERVICES

CONTROLLED ESTABLISHMENTS
Mr. Owen Smith
Assistant General Secretary
Declaration of control, limitation of profits.

LANDS DEPARTMENT
(Ministry of Munitions and War Office)
Sir Howard Frank
Director-General
Registration and purchase of land.

CONTRACTS
Mr. P. Hanson, C.B.
Director-General
Munitions contracts.

PRIORITY
Mr. Edgar Jones, M.P.
Controller
Priority administration.

DESIGN
Maj.-Gen. Hon. F. R. Bingham, C.B.
Military Adviser and Director-General
Design of guns and ammunition, small arms, grenades, etc.
Brig.-Gen. L. C. Jackson, C.B., C.M.G.
Trench Warfare Research.

INSPECTION
Sir Sothern Holland, Bt.
Director-General
Drawings, etc. Inspection in United Kingdom, Canada, and U.S.A.

INVENTIONS
Col. H. E. F. Goold-Adams, C.B., C.M.G., R.A.
Comptroller
Munitions inventions, royalties and rewards.

SUPPLY DEPARTMENTS

MATERIALS, etc.
Sir Frederick Black, K.C.B.
Director-General of Munitions Supply
Hon. H. D. McLaren, M.P.—Area organisation.
Mr. L. W. Llewelyn—Non-ferrous metals.
Mr. John Hunter—Iron and steel production
Mr. John Hunter—Factory construction.
Mr. A. Herbert—Machine tools.
Mr. E. H. Fry—Petroleum supply.
Sir Lionel Phillips Bt.—Mineral resources development.
Maj. Hon. H. L. Cripps—Central stores

SCRAP METALS
Mr. Alex Walker
Director
Collection and utilisation of scrap metals.

SHELL AND GUN MANUFACTURE
Sir Glynn West
Director-General
Mr. H. Stevens—Shell manufacture.
Mr. J. B. Maclean—Gun and carriage manufacture.
Mr. J. M. Anderson—Gun forgings.
Mr. M. G. Humphreys—Output progress statistics.
Mr. M. F. Ryan—Gauges.
Capt. W. McLellan—Electric power supply

ORDNANCE
Sir Charles Ellis, K.C.B.
Director-General
Lt.-Col. L. C. P. Miman, C.M.G., R.A.
Gun ammunition filling
Mr. Alex Duckham—Small arms and small arms ammunition.
Capt. A. U. Grele—Salvage
Sir Vincent Raven—Chief Superintendent, Royal Ordnance Factories.

EXPLOSIVES
Rt. Hon. Lord Moulton, K.C.B., F.R.S.
Director-General
Mr. A. S. Jamsons—Raw materials.
Mr. F. L. Halford—Gas products.
Mr. R. R. Enfield—Acid supplies.
Mr. R. A. Alston—High explosives contracts.
Col. W. A. Churchman—Ammonium nitrate
Col. Sir F. C. Nathan—Propellants.
Mr. K. B. Quinan—Explosives factories.
Lt.-Col. C. E. Phipps, C.B., R.A.—Safety of explosives factories.
Mr. R. Unwin—Housing of workers for explosives factories.
Lt.-Col. H. W. Kempster, C.M.G.
Storage.

TRENCH WARFARE
Sir Alex. Roger
Director-General
Lt. L. G. Shadbolt—Filled grenades.
Capt. H. Moreland—Gas supplies.
Capt. A. P. Stockings—Medium trench howitzers and ammunition, aerial bombs.
Capt. W. Ellison—Heavy trench howitzers and ammunition.
Mr. J. Macintosh—Protective armour and fireworks.
Mr. G. Leevers—Light trench howitzers and ammunition.
Capt. J. A. Leeming, R.E.—Outside Engineering Branch.
Mr. F. B. Sanderson—Bomb-filling stations and stores.
Mr. F. J. Ricarde-Seaver—Transport.

MECHANICAL WARFARE
Lt.-Col. A. G. Stern, C.M.G.
Director-General
Design and supply of "tanks."

MECHANICAL TRANSPORT
Mr. P. Martin
Director-General
Design and supply of mechanical transport vehicles and petrol engines.

AMERICAN & TRANSPORT DEPARTMENT
Sir Ernest Moir, Bt.
Director-General
Mr. H. Japp—American organisation.
Mr. A. S. Esslemont and Mr. F. J. Cheshire—Optical munitions and glassware.
Mr. E. J. Allen—Railway materials.
Mr. A. Ross—Railway material licences.
Mr. Howard Williams—Railway transport.
Mr. R. Burton Chadwick—Overseas transport.
Mr. W. T. Potts—Port forwarding.

AGRICULTURAL MACHINERY
Mr. F. S. Edge
Controller
Supply and control of agricultural machinery.

AERONAUTICAL SUPPLIES
Sir William Weir
Controller
Lt.-Col. W. Alexander, D.S.O.
Supply of aeroplanes, engines, seaplanes, kite balloons, accessories, materials.
Mr. J. W. Gibson
Aeronautical requisitions and statistics
Lt.-Col. R. K. Bagnall Wild
Inspection

IMPERIAL MUNITIONS BOARD
Representative in England: Hon. R. H. Brand, C.M.G

INTER-ALLIED MUNITIONS BUREAU
English Representative: Mr. M. S. Amos.

METAL AND MATERIALS ECONOMY COMMITTEE
Chairman: Mr. C. W. Fielding.

PRIORITY IN SHIPMENTS COMMITTEE
Chairman: Sir Frederick Black, K.C.B.

Departmental Organisation on 1 July, 1918.

MINISTER OF MUNITIONS
RT. HON. W. S. CHURCHILL, M.P.

PARLIAMENTARY AND FINANCIAL SECRETARY
SIR L. WORTHINGTON EVANS, Bt., M.P.

SECRETARY
SIR W. GRAHAM GREENE, K.C.B.
Mr. J. E. Masterton Smith, C.B.
Assistant Secretary

PARLIAMENTARY SECRETARY
Mr. F. G. KELLAWAY, M.P.

THE MUNITIONS COUNCIL

PRESIDENT
RT. HON. W. S. CHURCHILL, M.P.

VICE-PRESIDENT
SIR L. WORTHINGTON EVANS, BT., M.P.

VICE-PRESIDENT
Mr. F. G. KELLAWAY, M.P.

Member of Council Group Sec. *SIR W. GRAHAM GREENE, K.C.B.*
Member of Council Group D *MAJ.-GEN. THE HON. SIR F. R. BINGHAM, K.C.M.G., C.B.*
Member of Council Group S *SIR JOHN HUNTER, K.B.E.*
Member of Council Group M *SIR ERNEST MOIR, BT.*
Member of Council Group X *SIR KEITH PRICE*
Member of Council Group O *SIR JAMES STEVENSON, BT.*

Member of Council Group W *BRIG.-GEN. RT. HON. J. E. B. SEELY, C.B., D.S.O., M.P.*
Member of Council Group A *SIR ARTHUR DUCKHAM, K.C.B.*
Member of Council Group L *SIR STEPHENSON KENT, K.C.B.*
Additional Member of Council R *Mr. W. T. LAYTON, C.B.E.*
Additional Member of Council, representing Ministry of Munitions in Paris. *SIR CHARLES ELLIS, K.C.B.*

Additional Member of Council representing the War Office—MAJ.-GEN. SIR W. T. FURSE, K.C.B., D.S.O. (M.G.O.)

GROUP SEC.
SECRETARIAT
SIR W. GRAHAM GREENE, K.C.B.
Member of Council Group Sec.

COUNCIL SECRETARIAT
Assistant Secretary—
Mr. J. E. Masterton Smith, C.B.

PARLIAMENTARY AND GENERAL DEPARTMENT
Assistant Secretary—
Mr. R. H. Keenlyside, O.B.E.

ESTABLISHMENT
Assistant Secretary—
Mr. J. W. Dulanty, C.B.E.

DEMOBILISATION AND RECONSTRUCTION
Assistant Secretary—
Mr. H. H. Piggott, C.B.E.

HISTORICAL RECORDS
Director—Mr. G. I. H. Lloyd

PRIORITY DEPARTMENT
Controller—
Sir Edgar Jones, K.B.E., M.P.

REQUIREMENTS, STATISTICS AND ALLIES
Mr. W. T. Layton, C.B.E.
Additional Member of Council R

REQUIREMENTS DEPARTMENT
Assistant Secretary—
Mr. W. M. Page, C.B.E.

STATISTICAL AND PROGRESS DEPARTMENT
Controller—
Maj. M. B. U. Dewar, R.E.

NORTH AMERICAN DEPARTMENT
Assistant Secretary—Mr. P. Hanson, C.B.

GROUP L
LABOUR
SIR STEPHENSON KENT, K.C.B.
Member of Council Group L

LABOUR REGULATION
Controller—Mr. H. Wolfe, C.B.E.

LABOUR ADVISER'S DEPARTMENT
Chief Labour Adviser—Sir Thomas Munro, C.B.E.

LABOUR SUPPLY (Civil)
Director—Mr. T. M. Taylor, C.B.E.

LABOUR SUPPLY (Military)
Director—Mr. J. A. N. Barlow, C.B.E.

GROUP F
FINANCE
SIR L. WORTHINGTON EVANS, Bt., M.P.
Financial Secretary

Mr. S. Dannreuther, C.B.
Assistant Financial Secretary

Mr. J. H. Guy
Assistant Financial Secretary

Sir Philip Henriques, K.B.E.
Assistant Financial Secretary

COMMERCIAL FINANCE
Controller—Mr. H. Guedalla

DEPARTMENTAL FINANCE
Controller—Mr. A. E. Watson, O.B.E.

LABOUR FINANCE
Controller—
Mr. G. H. Duckworth

EXPLOSIVES FINANCE AND CONTRACTS
Controller—Mr. F. G. Bowers, O.B.E.

AIRCRAFT FINANCE
Controller—
Mr. W. E. Mortimer

FACTORY AUDIT AND COSTS
Controller—
Mr. Webster Jenkinson, C.B.E.

MUNITIONS WORKS BOARD
Chairman—Mr. J. Carmichael, J.P.

MUNITIONS CONTRACTS
Controller—Sir John Mann, K.B.E.

LANDS DEPARTMENT
(Ministry of Munitions and War Office)
Director-General—
Sir Howard Frank, K.C.B.

SALVAGE AND STORES
Controller—
Mr. Alexander Walker

GROUP D
DESIGN
MAJ.-GEN. THE HON. F. R. BINGHAM, K.C.M.G., C.B.
Member of Council Group D

DESIGN
Controller—Brig.-Gen. A. C. Currie, C.M.G.

INSPECTION
Controller—Mr. A. H. Collinson, C.B.E.

MILITARY ESTABLISHMENT
Section Director—Lt.-Col. C. M. Knight, D.S.O.

SUPPLY DEPARTMENTS

GROUP S
STEEL AND IRON
SIR JOHN HUNTER, K.B.E.
Member of Council Group S

STEEL AND IRON
Controller—Col. W. C. Wright, C.B.

FORGINGS, STAMPINGS AND CASTINGS
Controller—Mr. D. M. Anderson

FACTORY CONSTRUCTION
Director—Mr. W. B. Shaw

BUILDING BRICKS
Controller—Mr. H. Carter Pegg

GROUP M
MATERIALS, Etc.
SIR ERNEST MOIR, Bt.
Member of Council Group M

NON-FERROUS MATERIALS
Controller—
Sir Leonard Llewelyn, K.B.E.

INLAND TRANSPORT
Director—
Mr. Howard Williams, C.B.E.

FORWARDING DEPARTMENT
Director—Mr. W. T. Potts

MINERAL RESOURCES DEVELOPMENT
Director—Capt. L. Cockerell

RAILWAY MATERIALS
Director—Mr. E. J. Allen, C.B.E.

OVERSEAS TRANSPORT
Director—
Mr. R. Burton Chadwick, M.P.

OPTICAL MUNITIONS, GLASSWARE AND POTASH
Controller—
Mr. A. S. Esslemont, C.B.E.

GOVERNMENT ROLLING MILLS
Section Director—
Mr. P. M. Stewart, O.B.E.

GROUP X
EXPLOSIVES
SIR KEITH PRICE
Member of Council Group X

EXPLOSIVES SUPPLY
Controller—Maj. A. Corbett

MINERAL OILS
Controller—
Sir Arthur Churchman, Bt.

CHEMICAL WARFARE DEPARTMENT
Controller—Maj.-Gen. H. F. Thuillier, C.B., C.M.G.

GROUP O
ORDNANCE
SIR JAMES STEVENSON, Bt.
Member of Council Group O

GUN AMMUNITION MANUFACTURE
Controller—
Mr. C. H. Stevens, C.B.E.

GUN AMMUNITION FILLING
Controller—Brig.-Gen. L. C. P. Milman, C.M.G., R.A.

AREA ORGANISATION
Director—
Hon. H. D. McLaren, C.B.E., M.P.

SMALL ARMS AMMUNITION
Controller—Mr. L. Gordon, O.B.E.

TIMBER SUPPLIES
Controller—Mr. D. Bain

GUN MANUFACTURE
Controller—Mr. V. B. Stewart, O.B.E.

SMALL ARMS AND MACHINE GUNS
Controller—Lt.-Col. S. C. Halse, C.M.G.

ENGINEERING DEPARTMENT
Controller—Mr. E. V. Haigh, C.B.E.

MACHINE TOOLS
Controller—Mr. E. M. Iliffe, C.B.E.

GAUGES
Controller—Mr. M. F. Ryan, C.B.E.

ROYAL ORDNANCE FACTORIES
Chief Superintendent—Col. C. P. Martel, C.B.

GROUP W
WARFARE
BRIG.-GEN. RT. HON. J. E. B. SEELY, C.B., D.S.O., M.P.
Member of Council Group W

MECHANICAL WARFARE
Controller—Vice-Admiral Sir A. G. H. W. Moore, K.C.B., C.V.O.

MECHANICAL TRANSPORT
Director—
Lt.-Col. C. V. Holbrook

INVENTIONS
Controller—
Vice-Admiral Sir R. H. S. Bacon, K.C.B., K.C.V.O., D.S.O.

MECHANICAL WARFARE (Overseas and Allies)
Commissioner—Lt.-Col. Sir A. G. Stern, C.M.G., K.B.E.

TRENCH WARFARE DEPARTMENT
Controller—
Brig.-Gen. A. M. Asguith, D.S.O.

ELECTRIC POWER SUPPLY
Director—Mr. A. B. Gridley

AGRICULTURAL MACHINERY
Director—Mr. H. C. B. Underdown

GROUP A
AIR
SIR ARTHUR DUCKHAM, K.C.B.
Member of Council Group A

AIRCRAFT SUPPLY
Controller—
Brig.-Gen. W. Alexander, D.S.O.

AIRCRAFT TECHNICAL DEPARTMENT
Controller—Lt. J. G. Weir, C.M.G.

AERONAUTICAL INSPECTION
Director—
Lt.-Col. R. K. Bagnall Wild

AMERICAN ASSEMBLING
Controller—
Mr. Alexander Duckham

BALL BEARINGS
Director—Mr. J. D. Steven

APPENDIX VI.

Staffing.

(*a*) The Work of the Establishment Branch.

The Establishment Branch of the Ministry of Munitions was responsible for the proper equipment of the office, whether with personnel, accommodation, or office supplies, and for the registration and circulation of papers. The task was full of difficulty, as the number of suitable candidates for employment and of convenient buildings were already limited when the Ministry was established in June, 1915. Added to this, the normal Treasury control had been relaxed and, although appointments at salaries above £400 a year in the case of administrative, and above £500 a year in the case of technical officers required Treasury sanction, no other attempts were made from outside to limit the numbers employed or the expenditure on salaries.

The staff who formed the new department had been drawn from a variety of sources and served under varying conditions. Civil Servants were lent by other Government Departments and continued to draw their salaries from those departments. A number of military officers were appointed who continued to be paid by the War Office. Business men held important positions, often giving their services without remuneration or receiving a subsistence allowance. Temporary clerks, of whom the majority were women, were appointed at weekly salaries, and girls were employed as junior clerks and messengers.

The growth of the establishment organisation of the Ministry was gradual. At the outset each department had its own establishment section, and heads of departments, in most cases unused to Civil Service methods, frequently considered themselves alone responsible for the staffing of their departments. They pursued their own methods of recruiting and appointment, often with the Minister's special authority, and the staff were regarded as attached not so much to the Ministry as a whole, as to the particular officer under whom they served. Consequently there was no regular system of grading or remuneration, and a good deal of uncertainty existed as to the authority for appointment.[1]

These conditions were obviously unsatisfactory, and it was decided at a meeting of heads of departments on 5 January, 1916, to arrange for an independent investigation by experienced Civil Servants into the methods and conditions of appointment, promotion, pay and organisation of the staff. This was undertaken by Mr. E. B. Phipps, a Principal Assistant Secretary, and Mr. R. H. Carr, Chief Clerk and Deputy Accountant-General, both of the Board of Education.

---

[1] In the Munitions Supply Department a Staff Board met weekly to consider appointments and salaries, but this was an advisory body only, and the real authority for appointment was the signature of the head of the branch concerned.

On 26 February, 1916, as a result of their investigations, Mr. Phipps and Mr. Carr recommended the creation of a Central Establishment Branch under an officer holding a position similar to that of the Assistant Financial Secretary, and responsible for the co-ordination and control of the establishment sections in the different departments.[1] They also recommended the establishment of an Appointments Board to interview and suggest candidates for all but purely clerical posts. The first proposal was carried out in April, when a Central Establishment Branch was formed in the Secretariat, under Mr. R. H. Carr as Assistant General Secretary. The second suggestion was not adopted, nor did the Ministry avail itself of the Central Bureau established by the Civil Service Commission in May, 1915, for the provision of candidates for subordinate clerical posts.

This reorganisation facilitated the development of greater uniformity in the administration of staff. The departmental establishment sections[2] were retained under Establishment Officers, who were responsible to the Central Establishment Branch, and who met regularly to discuss questions of policy and procedure. Heads of departments continued to nominate their own staff, but the concurrence of the Establishment Branch was necessary before salaries could be fixed or appointments confirmed. A Munitions Expenditure Standing Committee, of which the head of the Central Establishment Branch was a member, was constituted by the Treasury to deal with questions of salaries outside Treasury limits and of scales of pay for classes of employees.

At the end of 1916 the appointment of military officers was brought within the scope of the Establishment Branch. Up to this time, questions relating to military staff had been dealt with independently by the Parliamentary Military Secretary. The Establishment Branch now became responsible for sanctioning salaries and appointments, and further communications with the War Office were then conducted by a Military Establishment Branch, at first attached to the Parliamentary Military Secretary, and later to the Director-General of Munitions Design.

In March, 1917, the Establishment Branch became responsible for the selection and supply of all candidates for clerical (including shorthand and typing) posts within the Ministry, and heads of departments were instructed to requisition such staff through an Establishment Officer. As regards higher staff, both technical and administrative, heads of departments retained their freedom of nomination, but they were expected to use the Offers of Service Sections, where registers were kept for men and women and engineering and accountancy experts assisted in the selection of candidates.

---

[1] Hist. Rec./R/261/2.

[2] By June, 1918, there were eight Establishment Sections, roughly corresponding to the geographical distribution of the Ministry, *i.e.*, Whitehall Place, Grand Hotel, Hotel Victoria, Whitehall Gardens, Storey's Gate (Explosives Supply Department, etc.), Kingsway (Aircraft Production Department), St. Ermin's Hotel (Priority Department), Princes Street (Inventions Department).

In addition to appointments and grading, the Establishment Branch had a certain responsibility for the distribution of staff, but, in this respect, it was largely dependent upon the judgment of heads of departments. In a department which grew as rapidly as the Ministry of Munitions,[1] and where time was so important a factor, it was impossible to make prolonged investigations before sanctioning applications for additional staff. From time to time, however, attempts were made to review the organisation of the department and to prevent reduplication and waste. In May, 1916, the distribution and control of the typing staff was investigated by Mrs. W. L. Courtney, and arrangements were made for better supervision. In March, 1917, an Organisation Commission, consisting of Colonel L. C. P. Milman, Mr. Alexander Duckham and Mr. Allan Smith, was appointed " to enquire into the extent and nature of the work that is being done in all departments of the Ministry of Munitions and into the adequacy of the staff provided for the purpose."[2] It was the intention of this commission to investigate each department, but, although it held forty-eight meetings between April and July, 1917, its enquiry only covered the departments of Ordnance Supply and Aircraft Production and a preliminary investigation of the Trench Warfare Supply, Finance and Contracts Departments. It reported instances of overlapping and defective organisation and various criticisms of the common service departments, but its activities were brought to an end in August, before the investigation could be carried further.

When Mr. Churchill became Minister of Munitions in July, 1917, he laid stress on the importance of reducing the headquarters staff, which exceeded 12,000. In April, 1918, a Staff Investigation Committee was appointed " to enquire into the numbers of and methods of employing the clerical and other members of the administrative staffs of all departments . . . . and to consider and report what economies or improvements can be effected."[3] The Committee made detailed investigations and came to the general conclusion that little could be done to reduce the numbers or improve the efficiency of the staff unless the existing distribution of functions was radically altered. They recommended the decentralisation of the Contracts and Accounts Departments and the grouping of the supply, contract and accounting work relating to a particular store in one department. They also advocated the formation of a Central Traffic Branch to include all sections dealing with transport and the

[1] During the six months, July, 1915–January, 1916, the headquarters staff of the Ministry grew from 668 to 3,082, and by the time of the Armistice the number had reached 25,144. See Appendix VI (*e*).

[2] Estab. Cent. 1/62.

[3] The Committee consisted of Sir Charles Henry, Bt., M.P. (Chairman), Sir Woodman Burbidge, Bt., C.B.E., Mr. J. W. Dulanty, C.B.E., Brig.-Gen. T. W. Hickman, C.B., D.S.O., M.P., the Viscountess Rhondda, Mr. J. B. Maclean, C.B.E., Sir James Masterton-Smith, K.C.B., and Mr. C. F. Wood. Mr. Christopher James, Mr. W. Reavell and Miss Sanders were subsequently appointed additional members.

centralisation of labour questions and of typing staff. Reports[1] were prepared on the different departments and detailed recommendations were made in each case, but the work of the Committee was brought to an end by the Armistice before the enquiry could be completed.

(*b*) Position of Naval and Military Officers.

The position of military officers within the Ministry was the subject of a good deal of controversy with the War Office. The chief questions at issue concerned (i) the retention of commissions by officers attached to the Ministry, (ii) promotion during service in the Ministry, whether of temporary officers, territorial officers or regular officers, and (iii) the granting of commissions to civilians serving in the Ministry.

At the War Office a perfectly clear and precise distinction had existed between military and civilian departments. The military departments, *e.g.*, the Master-General of Ordnance's department, were staffed by army officers temporarily allocated for service therein. The civil departments, *e.g.*, the Finance and Contracts Departments, were recruited from the ordinary Civil Service sources and supplied the permanent element in the War Office organisation. At the outset the Army Council appear to have taken the view that the Ministry of Munitions, being in fact an offshoot of the Master-General of Ordnance's department, was a military department, and in a letter to the Treasury of 7 September, 1915, they requested that the emoluments of officers, non-commissioned officers and men whose services were placed temporarily at the disposal of the Ministry for special duties should be issued at army rates out of army votes as if they had remained under the direct orders of the Army Council "in order to avoid having to treat the work of such officers and soldiers as coming within the category of civil employment." In this the Treasury concurred.[2]

The course of events led the Army Council to change their attitude. On the one hand, the Ministry rapidly developed as an independent institution of essentially "civilian" character. On the other, especially during the six months preceding the institution of the Central Establishment Branch in April, 1916, high military rank for officers in the Ministry was claimed and granted on a rather lavish scale, and to an extent to cause dissatisfaction among combatant and regular officers.[3] As a result, in the course of 1916 the War Office began to take up a critical attitude towards applications for grants of commissions or promotion for officers in the Ministry. It was contended that, as a matter of principle, military rank denotes nothing but a certain status in the Army. As applied to civil positions it is not merely without meaning, but tends to lessen the value of the real rank and is therefore indirectly injurious to combatant officers. Though it was true that the Army depended to a very great extent

[1] Hist. Rec./R/263/20. [2] 48/Gen. No./3541.
[3] Minute by Mr. Phipps in M.C. 177.

on the assistance of the Ministry, many other civil administrations helped the combatant services in a greater or lesser degree, and no one would suggest that the officials of every administration which assisted the Army should have military rank, nor that it should be conferred on all officials in the Ministry of Munitions. The War Office were also sceptical upon the plea of expediency, holding that in business negotiations the tenure of a responsible position in the Ministry itself counted for far more as regards " prestige " than the possession of military rank.

This change of attitude resulted in a War Office letter[1] of 14 April, 1917, in which it was stated that no commissions would in future be granted to civilians for work under the Ministry. Officers, however, holding temporary commissions were to be allowed to retain their commissions (unless released for duty with civilian firms). Officers of the Territorial Force were to be transferred to the Territorial Force Reserve. Higher temporary rank would not as a rule be granted to officers in the Ministry, but special cases might be submitted and would be dealt with under the rules that applied to officers directly employed under the Army Council.

This last stipulation was not, in the opinion of the Ministry, interpreted in a very liberal spirit, the hardship being especially noticeable in the case of technical officers holding military rank. When Mr. Churchill became Minister the whole question was raised afresh. If the Ministry had been willing to make a distinction between military and civil departments, it is possible that the Army Council would have been more willing to meet the Ministry's claims as regards officers in the military departments. But this policy was not adopted, as the distinction could not be based upon any clear-cut differences and an attempt to differentiate would inevitably lead to difficulties. Nevertheless, the Army Council consented to accept applications for commissions for civilians and to deal with each case on its merits. They also consented to treat territorial officers in the same way as regular officers.[2]

In the case of the Aeronautical Supply Department a different course was followed.[2] This department, which became part of the Ministry in February, 1917, was an amalgamation of a branch of the War Office Directorate of Aircraft Equipment with a small staff transferred from the Admiralty. As transferred it was wholly a military (and naval) establishment, and though a few civilians were subsequently appointed to certain posts, it continued to be essentially military. However, by October, 1917, it had become plain, as was pointed out by the Establishment Officer, Mr. Spry, that whereas military promotion was continuing at the normal rate in that part of the Aircraft Equipment Department that still remained within the War Office, it had wholly stopped in the Ministry Department.

The attention of the War Office was called to this state of affairs and the scheme of promotions proposed by the Ministry granted. Subsequently it was arranged that military rank should be automatically

[1] 100/Gen. No./3515. [2] M.C. 177.

associated with the various administrative grades in the department, Section Directors being graded as Majors, Sub-Section Directors as Captains, and so on.

This case illustrates the fact that no consistent principle was adopted in dealing with questions of military status within the Ministry.

The treatment of naval officers serving in the Ministry presents a further diversity.[1] Previous to the aircraft transfer very few naval officers had been employed in the Ministry, and no controversy had arisen. When a naval staff was transferred in connection with aeronautical supply, the Admiralty allowed R.N.V.R. officers "transferred with their work" to retain, as a special favour, their uniform while serving in the Ministry, but struck them off the Admiralty pay roll. When, however, the Ministry subsequently asked for the services of another R.N.V.R. officer, the Admiralty stipulated that he should not wear uniform, taking the line that work in the Ministry was "civilian employment."

Regular R.N. officers, however, lent to the Ministry and employed on other than purely civilian work were allowed to continue to wear their uniform, and, if appointed to responsible posts, might be recommended to the Admiralty for promotion.

(*c*) Women Staff.

One of the outstanding features of the staff of the Ministry as compared with that of the permanent Departments of State was the high proportion of women employed. In May, 1916, a month after the formation of the Central Establishment Branch, Mrs. W. L. Courtney, who had previous experience as organiser and manager of the Bank of England women staff, was invited to enquire into the conditions under which these women were working in the various headquarter departments of the Ministry. As a result of her reports, ten Chief and Assistant Welfare Supervisors were appointed for different parts of the Ministry, Mrs. Courtney being Chief Welfare Supervisor for Whitehall Place and "Adviser to the Head of the Establishment Branch on all questions affecting the welfare of the women staff."[2] The Welfare Supervisors were not as such[3] officially concerned with the work and efficiency of the women staff, for which the Section Directors were necessarily responsible. They contributed, however, to efficiency in that they undertook responsibility for the behaviour of women in passages, cloakrooms, etc., and thus reduced waste of time. They also made it their business to establish personal contact with the women as widely as possible and were available for receiving complaints and giving advice on all matters that might arise.

At the same time sick rooms in charge of trained nurses were established in the larger buildings, and it was found that these not only justified themselves on grounds of health and humanity, but also contributed to efficiency, since women who would otherwise, owing to indisposition, have gone home for the day were able and willing, after treatment in the sick room, to return to work.

---

[1] Estab. Cent. 51/5. [2] General Office Notice, No. 38.

[3] Some of these officers were already charged with the control of clerical or typing staff and continued to perform those duties in conjunction with their welfare work.

In July, 1917, Mrs. I. G. Tennyson, who had previously been in charge of the Women's Offers of Service Register, succeeded Mrs. Courtney as Chief Welfare Supervisor and Adviser to the Head of the Establishment Branch.[1] After six months' work Mrs. Tennyson expressed the view that "the arrangements for the Women's Staff in regard to discipline, welfare, relations with the men, and standard of work" were far from satisfactory, and that the only remedy was through a far stronger administrative machinery.[2] She proposed that there should be appointed a "Head of the Women's Staff," who should have in regard to such staff the power of a Deputy Assistant Secretary, and that all questions regarding women and all complaints by or against women should be addressed to a Women's Section of the Establishment Department. She also proposed that a Woman Staff Officer should be attached to each Deputy Controller and a Woman Staff Clerk to each Section Director who would act as a liaison officer between the head of a department and the women staff, with the right of appeal to the Head of the Women Staff if she failed to secure satisfactory results. Thus whereas the Welfare Supervisors had concerned themselves solely with discipline outside the workrooms, the staff proposed by Mrs. Tennyson would be vitally concerned with the working of the women staff of the department in all its aspects and the acceptance of her proposal would in effect reform the machinery, not only of the Establishment Branch, but of every department of the Ministry.

This scheme did not meet with approval. There was no objection to the appointment of departmental women representatives to work in close co-operation with the Welfare Supervisors of the Establishment Branch. But a sharp distinction was drawn between welfare work, such as that for which the special women's staff already existed, and questions of departmental discipline and organisation, in regard to which it was held that no separate treatment of women was admissible. Speaking at a later date, Mr. (later Sir James) Masterton-Smith stated that the division of control was impracticable, "as the duties of men and women on the clerical establishment of the Ministry are so closely interlaced that it is impossible to treat them separately, and for the smooth and easy working of the machine it is essential that at some point establishment questions relating both to men and women must be co-ordinated."

Mrs. Tennyson resigned in March, 1918,[2] but the question was again considered in the autumn of 1918 by Mr. Masterton-Smith and Mr. Dulanty in co-operation with a group of women employed in the Ministry, who drew up a revised scheme which was finally adopted in September.[3] A Woman Staff Officer[4] was appointed in every department of the Ministry responsible to the head of the department for all matters relating to leave, attendance and discipline of the women staff, and with the right of appeal to the Establishment Department. All communications on these subjects were in the first instance addressed to her, and finally passed to the head of the Women's Section of the

[1] General Memorandum, No. 12. [2] Estab. Cent. 35/1.
[3] Estab. Cent. 1/127. General Memorandum, No. 123.
[4] In the larger departments Sectional Women Staff Officers were appointed to assist the Woman Staff Officer.

Establishment Department. In order to secure uniformity in the treatment of women throughout the Ministry, Miss H. Sanders was appointed as Chief Adviser on Women Staff to maintain close and constant touch with the Women Section Directors (in the Establishment Branches) and with the Women Staff Officers (in the departments) and to be accessible to all women who wished to see her. The Head of the Establishment Department was instructed to consult her upon all questions relating to the women staff, and she was given the right of appeal to the Secretary or Assistant Secretary when the Head of the Establishment Department did not see his way to act upon her advice. Thus a regular channel of appeal for women was established from the lowest grade up to the highest authority under the Minister, although the Chief Woman Officer in the Establishment Department did not hold the position of a Deputy Assistant Secretary.

(*d*) Juvenile Staff.

The employees at headquarters under 18 years of age numbered at the time of the Armistice about 2,500, or one-tenth of the whole headquarters staff. They were employed as typists, clerks and messengers. Five-sixths of them were girls and the bulk of those under 16 belonged to the messenger staff.

The employment of young girls as messengers was open to objection as a "blind alley" occupation and attempts were made to mitigate its disadvantages. The Whitehall Gardens Establishment Branch, instead of having a separate messenger staff, appointed "messenger-clerks," who received clerical training and were promoted in course of time to full clerical duties, in which capacity they were preferred to clerks taken from outside. This arrangement secured a superior class for messenger service.

Messengers in the Ministry of Munitions were encouraged to attend the Whitehall Messenger Classes which had originated at the War Office in 1910, and were open to messengers from all the Government Offices in or near Whitehall. The classes were held three evenings a week, from 5 to 7 o'clock, and instruction was given in shorthand, Civil Service subjects, technical subjects, book-keeping, shorthand and typewriting.[1] If they did not attend these classes, messengers were asked to produce evidence of attendance at ordinary evening classes, but this was not made a condition of employment.

In January, 1918, as a result of enquiries made by the President of the Board of Education,[2] classes for girl messengers under 16 years of age were instituted for all branches of the Ministry, and those not attending the Whitehall Messenger Classes attended the classes in the Ministry for two hours on three days in the week during office hours. Teachers were supplied by the London County Council and the syllabus aimed at giving general education as well as clerical training.[3]

Plans were made to extend this education scheme so as to provide for all employees of the Ministry under 18, but nothing had been accomplished at the time of the Armistice.

---

[1] Estab. Cent. 17/7. [2] Estab. Cent. 17/11.

[3] The time-table included English Composition and Literature, Social History in the Nineteenth Century, Commercial Geography, and Arithmetic.

(*e*) Indoor and Field Staff of the Ministry of Munitions Paid from Headquarters.

(Figures in italics are additional and show the Field Staff paid from Headquarters.)

	1915.	1916.		1917.		1918.		1918.	1919.
1st Week of :—	July.	January.	July.	January.	July.	January.	July.	11 Nov.	April.
Secretariat			1,204*a*	1,157*b c*	1,529	2,013	2,846*l*	3,071	1,597
				2	—	*1*	—	*31*	*6*
Labour—									
Labour Regulation	283	823		137	181	226	—	308	73
				46	*80*	*131*	—	*195*	*8*
Labour Supply				475	566	657	—	688	12
				129	*406*	*409*	—	*506*	—
Total			679	612*b*	747	883	968	996	85
				175	*486*	*540*	*566*	*701*	*8*
Finance—									
Finance and Accounts	—	121	342	1,073*d*	1,902	2,805	—	4,242	4,563
	—	—	—	*11*	*14*	*23*	—	*308*	*308*
Contracts	—	—	—	—	420*g*	536	—	1,194	882
	—	—	—	—	*3*	*3*	—	*68*	*55*
Controlled Establishments	—	—	—	167*e*	221	53*k*	—	—	—
	—	—	—	*2*	*12*	*14*	—	—	—
Miscellaneous	—	—	—	—	—	—	—	1,339*o*	1,136
	—	—	—	—	—	—	—	*154*	*106*
Total	—	121	342	1,240	2,543	3,394	5,640*m*	6,775	6,581
	—	—	—	*13*	*29*	*40*	*143*	*530*	*469*
Other Common Services—									
Design	—	22	117	131	168	192	—	181	5
	—	—	—	*4*	*4*	*8*	—	*11*	—
Inspection	—	10	62	109	326*h*	376	—	101*m*	72
	—	—	—	*1*	*4*	*6*	—	*12*	*9*
Inventions	—	88	139	98*b d*	120	132	—	168	100
	—	—	—	—	*1*	*1*	—	*53*	*35*
Priority	—	—	—	—	412*g*	438	—	253	23
Total	—	120	318	338	1,026	1,138	570*l m*	703	200
	—	—	—	*5*	*9*	*15*	*30*	*76*	*44*
Supply Departments—									
Munitions Supply (Materials, etc.)				1,204	987*i*	1,441			
				27	*44*	*47*			
Ordnance Supply				396	449	520			
				49	*60*	*66*			
Shell Manufacture	224	1,345	1,532*a*	476	754	889			
				66	*73*	*75*			
American and Transport				205	327	400	3,470	3,472	1,933*p*
				12	*25*	*29*	*505*	*712*	*351p*
Mechanical Transport	—	—	—	152	132	142			
	—	—	—	*8*	*6*	*6*			
Trench Warfare Supply	52	281	441	317*b d*	401	412			
	—	—	—	*151*	*146*	*149*			
Mechanical Warfare	—	—	—	50	119	165			
	—	—	—	*12*	*62*	*64*			
Agricultural Machinery	—	—	—	—	40	68	—	51	17
Aeronautical Supplies	—	—	—	—	—	1,213	1,738	4,262	1,954
	—	—	—	—	—	*57*	*103*	*268*	*126*
Explosives	109	392	632	390*b d*	536	563	706*n*	780	296
	—	—	—	*31*	*60*	*77*	*94*	*192*	*54*
Total	385	2,018	2,605	3,190	3,736	5,813	5,914	8,565	4,200
	—	—	—	*356*	*476*	*570*	*702*	*1,172*	*531*
Messengers and Cleaners	—	—	—	1,084*f*	1,638	1,924	2,404	2,524	1,939
Total — Indoor Staff				6,537	9,581	13,241	15,938	20,110	12,663
Total — Messengers and Cleaners				1,084	1,638	1,924	2,404	2,524	1,939
Total — Field Staff Paid from Headquarters	668	3,082	5,148	*551*	*1,000*	*1,166*	*1,441*	*2,510*	*1,058*
Grand Total	668	3,082	5,148	8,172	12,219	16,331	19,783	25,144	15,660

(*a*) Munitions Supply Departmental Staff Organisation transferred to Secretariat from April, 1916.
(*b*) Establishment Branches of Labour, Inventions, Trench Warfare Supply and Explosives Supply Departments transferred to Secretariat from August, 1916.
(*c*) Messengers and Cleaners shown separately from October, 1916.
(*d*) Finance Branches of Inventions, Trench Warfare Supply and Explosives Supply Departments transferred to Finance Department from August, 1916.
(*e*) Hitherto shown in Labour Department.
(*f*) Hitherto shown in Secretariat.
(*g*) Hitherto shown in Munitions Supply Department.
(*h*) Central Stores Branch included from April, 1917.
(*i*) Priority and Contracts Departments shown separately from March, 1917.
(*k*) Functions transferred to Inland Revenue Department from September, 1917.
(*l*) Priority Department included in Secretariat from February, 1918.
(*m*) Central Stores Department included in Finance Department from February, 1918.
(*n*) Mineral Oil Production and Chemical Warfare Departments included from February, 1918.
(*o*) Salvage, Central Stores, Surplus Stores, Munitions Works Board.
(*p*) Disposal Board included comprising 233 indoor and 13 field staff paid from Headquarters.

APPENDIX VII.

Accommodation.

The Ministry of Munitions, which at the date of the Armistice occupied about 100 buildings or portions of buildings,[1] began its existence in three separate localities. The Minister and the Secretariat and Labour Department were housed at 5 and 6, Whitehall Gardens. The Explosives and Trench Warfare Supply Departments were at Storey's Gate and King Charles Street respectively. The Munitions Supply Department, after being crowded into a few rooms at the War Office with an overflow into the Hotel Cecil moved into the unfinished buildings of the Department of Agriculture and Fisheries, which subsequently became known as Armament Buildings, on 15 June. The lists which follow show the growth of the Ministry accommodation from these three centres.

The Whitehall Gardens Staff spread into bungalows which were built in the gardens of No. 5 and No. 6. The Armament Buildings staff began before the end of 1915 to invade the Hotel Metropole, which with the Minister's removal thereto in March, 1916, became the Headquarters of the Ministry, and spread onwards until it virtually monopolised Northumberland Avenue. The occupation of the Institute of Mechanical Engineers was followed by the occupation of a scattered group of buildings lying between Westminster Abbey, Birdcage Walk and Victoria Street. A fourth large nucleus in Kingsway was added in the spring of 1917, when the Ministry became responsible for aircraft supplies.

Accommodation on 1 *January*, 1916.

5 and 6, Whitehall Gardens.
Forecourt Bungalow, Whitehall Gardens.
Armament Buildings, Whitehall Place.
Hotel Metropole (part), Northumberland Avenue.
Institute of Mechanical Engineers, Storey's Gate.
Chemical Institute.
Institute of Civil Engineers.
32 and 34, Old Queen Street.
8, 9, 10, Princes Street.
Board of Education, King Charles Street.

[1] An exact enumeration of buildings occupied at the time of the Armistice has not been attempted as it involves difficult and unprofitable questions of definition, as in cases where a row of houses originally separate units had been joined by internal communication.

Accommodation acquired January–June, 1916.

Hotel Metropole (entire), Northumberland Avenue.
16 and 18, Old Queen Street.
4th Floor, Queen Anne's Chambers.

Accommodation acquired July–December, 1916.

37 and 38, Bury Street.
9, Northumberland Avenue (S.P.C.K. Building).
Lincoln's Inn House.
Grand Hotel and Annexe, Northumberland Avenue.
Constitutional Club, Northumberland Avenue.
5-9, Northumberland Street (houses).
12, Old Queen Street.
16, Queen Anne's Gate (part).
Charing Cross Embankment Building.
Montagu House, Whitehall Gardens.
Hotel Victoria, Northumberland Avenue.
St. Ermin's Hotel, Caxton Street.

Accommodation acquired January–June, 1917.

14-20, Cockspur Street.
National Gallery (part), Trafalgar Square.
Block III, Queen Anne's Gate Buildings (37 to 41, Old Queen Street).
Broadway House (1st and 2nd floors).
Queen Anne's Chambers (6th floor).
War Office Embankment Annexe (part).
1, 6, 7, 8, Richmond Terrace.

Accommodation acquired July–December, 1917.

123, Pall Mall.
King's House, Kingsway.
Avenue House, Northumberland Avenue.
Durham House, 16, John Street.
117, 118, Piccadilly.
22, 23, Hertford Street.
2, Pall Mall East (Barclay's Bank).
120, Pall Mall.
53, Parliament Street.

Accommodation acquired January–June, 1918.

Palmerston House, Old Broad Street.
125, Pall Mall.
Queen's House.
Craven House, Northumberland Avenue.
Wellington Club, Grosvenor Place.

January–June, 1918—*cont.*

9, Halkin Street.
24, Old Queen Street.
24, Gordon Square.
University College (part).
Broad Sanctuary Chambers.
St. James's Park Annexe.
53, Parliament Street.
58, Victoria Street.
Imperial House, Kingsway.
York House, Kingsway.
Alexandra House, Kingsway.
Pen Corner House, Kingsway.
Central House, Kingsway.
West Africa House, Kingsway.
Griffin House, Kingsway.
Regent House, Kingsway.
Carlton House, Kingsway.

Accommodation acquired July to 11 *November*, 1918.

29A, Charing Cross Road.
9, Hertford Gardens.
6A, Suffolk Street.
Hertford House, Manchester Square.
18–20, Manchester Square.
23, Craven Street.
Block IV, Queen Anne's Gate Buildings (29–35, Old Queen Street).
15, Endsleigh Street.
59–64, Queen's Gardens, Paddington.
Kingsway House, Kingsway.
1–6, Clement's Inn, Kingsway.
Strand House Annexe, Kingsway.

After the Armistice, accommodation for the Disposals Board was acquired at Earl's Court, and the clubs, hotels, and other buildings were restored to their original owners. The headquarters of the Ministry was moved from the Hotel Metropole into Armament Buildings, and when, in the summer of 1920, the moribund department was dispossessed of its place in Whitehall, the name "Armament Buildings," carved in stone over the entrance, gave place to that of "Ministry of Agriculture and Fisheries." The conversion of the sword into the ploughshare was thus literally symbolised.

APPENDIX VIII.

List of some of the Principal Officers employed in the Ministry of Munitions during the War.

ADDISON, RT. HON. C., M.D., M.P.	Parliamentary Secretary of Ministry of Munitions (9.6.15); Minister of Munitions (11.12.16–20.7.17).
ALEXANDER, BRIG.-GEN. SIR W., C.B. 1919, K.B.E. 1920, C.M.G. 1918, D.S.O., T.D. (*Messrs. Charles Tennant & Co., Ltd.*)	Controller of Aeronautical Supply (22.12.17); Director-General of Purchases (14.3.19–15.1.20); Ministry representative on Air Council (6.3.19).
ALLEN, E. J., C.B.E. 1918 .. (*Messrs. S. Pearson & Sons, Ltd.*)	Director of Railway Materials (7.10.16–31.12.18).
ANDERSON, D. M., C.B.E. 1920 (*Messrs. Cammell, Laird & Co.*)	Additional Gun Repair Section (1.3.17); Deputy Director-General Gun Forgings (8.7.17); Controller of Forgings, Stampings and Castings (23.2.18–16.12.18).
ANDERSON, W. T., C.B.E. 1920 (*East Rand Proprietary Mines Co., Ltd.*)	Chief Technical Adviser, Mineral Resources Development Department (2.4.17); Controller of Iron Ore Mines (6.2.18–6.2.19); Chief Labour Adviser (24.4.19).
ASQUITH, BRIG.-GEN. A. M., D.S.O., R.N.V.R.	Controller of Trench Warfare Department (15.4.18–2.12.18).
ATKINSON, R. M.	Director of Stampings and Castings (5.10.16–8.3.18).
BACON, VICE-ADMIRAL SIR R. H. S., K.C.B. 1916, K.C.V.O. 1916, C.V.O.1907, D.S.O. (*Coventry Ordnance Works.*)	Controller of Munitions Inventions (12.1.18–31.3.19); Ministry representative on Committee on Awards for Inventions (10.6.18).
BAGOT, MAJ. THE HON. W. L., D.S.O. (*Victoria Falls Power Co.*)	Director of Propellant Supplies (7.6.15–22.12.15).
BAIN, D., C.B.E. 1918 .. .. (*Midland Railway Company.*)	Horse-drawn Transport Vehicle Section, Munitions Supply Department (18.6.15); Ministry representative on War Timber Commission (14.12.16); Deputy Director-General of Packages and Timber (9.8.17); Controller of Timber Supplies (21.3.18); Liquidator of Horse-drawn Transport Vehicles, etc. (4.1.19–30.6.19).
BARLOW, COL. SIR H. W. W., BT., C.B. 1913, C.M.G. 1918. (*Superintendent of Royal Laboratory, Woolwich.*)	Consultant on National Filling Factories (—.3.16); Technical Adviser on Danger Building Practice (23.6.16); Controller of Condemned Munitions Recovery (1918–31.5.20).

BARLOW, J. A. N., C.B.E. 1918. (*Board of Education.*)	Private Secretary to Parliamentary Secretary (31.5.15); Private Secretary to Minister (11.12.16); Deputy Director-General of Labour Supply (9.1.17); Director of Labour Department (Military) (15.2.18–16.11.18).
BARROW, O. T., C.B.E. 1918, C.S.I. 1907. (*Indian Civil Service.*)	Director of Munitions Accounts (—.11.15); Director of Munitions Finance (6.1.17); Assistant Controller of Munitions Finance (—.11.17–30.11.18).
BENSON, W. J., O.B.E. 1919 .. (*Johannesburg Consolidated Investment Co., Ltd., etc.*)	Foreign Orders Section, Munitions Supply Department (17.7.15); Director of Foreign Supplies (1916); Acting Deputy Director-General (B) (18.1.17–31.5.19).
BEVERIDGE, SIR W. H., K.C.B. 1919. (*Board of Trade.*)	Assistant General Secretary to Ministry of Munitions (31.5.15–9.10.16).
BINGHAM, MAJ.-GEN. THE HON. F. R., C.B. 1915, K.C.M.G. 1918. (*War Office.*)	Military Adviser and Director-General of Munitions Design (25.9.16); Member of Munitions Council D (20.8.17–31.12.19); Member of Army Council (8.10.17).
BLACK, SIR F. W., K.C.B. 1917. (*Admiralty.*)	Director-General of Munitions Supply (3.8.15); Head of Mission to India (13.3.17); Mission to U.S.A. (1917); Member of Munitions Council A (—.11.17); Acting Chairman of British War Mission (—.11.17– —.2.18).
BLAND, BRIG.-GEN. W. ST. C., C.B. 1917, C.M.G. 1919. (*Member of Ordnance Board.*)	Chairman of Ordnance Committee (5.12.15); President of Ordnance Committee (1916–18).
BOOTH, G. M. .. .. .. (*Messrs. Alfred Booth & Co., etc.*)	Member of Armaments Output Committee (31.3.15); Member of Munitions of War Committee (8.4.15); Appointed joint head of Special Organisation at War Office to increase Munitions Production (28.4.15); Deputy Director-General (B), Munitions Supply Department (5.6.15–20.12.18); Chairman of Russian Supplies Committee (1915–18).
BOWERS, F. G., O.B.E. 1918 .. (*National Insurance Audit Department.*)	Assistant Director of Munitions Finance (1915); Controller of Explosives Finance and Contracts (1918–31.12.19); Chairman of Advisory Committees on Explosion Claims.
BRAND, HON. R. H., C.M.G. 1910. (*Messrs. Lazard Bros. & Co.*)	Representative of Imperial Munitions Board (19.5.16); Liquidator for Canadian Contracts (4.1.19– —.9.19).
BRIDGES, MAJ.-GEN. G. T. M., C.B. 1918, C.M.G. 1915, D.S.O.	Controller of Trench Warfare Department (13.12.17–17.4.18).
BROWN, A. HALL, O.B.E. 1918. (*Messrs. Richardson, Westgarth & Co., Ltd.*)	Technical Assistant, Shell and Gun Manufacture Department (7.8.17); Deputy Controller of Gun Manufacture (—.3.18); Controller (28.12.18–31.5.19).
BROWNE, COL. G. H. S., C.B. 1917. (*Chief Inspector of Small Arms.*)	Chief Inspector of Small Arms (1.3.14); transferred to Ministry of Munitions in this capacity (25.8.15–1.4.19).

BURGOYNE, LT.-COL. A. H., M.P. (*Messrs. P. B. Burgoyne & Co., Ltd.*)	Controller of Priority (26.7.18–21.4.19).
BYRNE, BT.-COL. F. J., C.M.G. 1917. (*Messrs. Dorman, Long & Co., Ltd.*)	Deputy Director-General of Design (3.12.15); British Military Equipment Section, Russia (—.3.16); Secretary to War Priorities Committee (31.10.17).
CADMAN, SIR JOHN, K.C.M.G. 1918, D.Sc., F.G.S., M.I.C.E. (*Birmingham University.*)	Technical Adviser, Trench Warfare Supply Department (1915); Controller of Mineral Oil Production (6.7.17–30.4.18).
CARMICHAEL, SIR JAMES, K.B.E. 1919, J.P.	Chairman of Munitions Works Board (17.10.17); Chairman of Building Materials Supply Committee (25.10.17); Liquidator of Assisted Contracts (4.1.19–1.8.19).
CARLYLE, SIR R. W., K.C.S.I., C.I.E. (*Indian Civil Service.*)	Director of Housing Management (14.2.16–31.7.19).
CARR, R. H. .. .. .. (*Board of Education.*)	Assistant General Secretary in charge of Central Establishment Branch (11.4.16–5.8.17).
CHADWICK, SIR R. BURTON, KT. 1920, M.P. (*Messrs. Joseph Chadwick & Sons.*)	Priority Section, Munitions Supply Department (—.9.15); Director of Overseas Transport (29.2.16); Deputy Director-General (—.1.17); Ministry representative on Port and Transit Executive Committee (15.3.18); • Chairman of Committee on Priority in Shipment of Munitions from Abroad (1918); Ministry representative on Tonnage Priority Committee (1918); Director-General of Transport (13.5.19-31.3.20).
CHARTRES, JOHN .. .. (*Barrister-at-law.*)	Intelligence Section, Armaments Output Committee (—.5.15); Munitions Supply Department (5.6.15); Director of Intelligence and Record, Labour Department (31.8.15–1918).
CHESHIRE, PROF. F. J., C.B.E. 1918, A.R.C.S. (*Patent Office.*)	Scientific and Technical Director of Optical Munitions (23.6.15); Consulting Adviser (1.6.17).
CHETWYND, LORD, C.H. 1917.. (*Messrs. Vickers, Ltd.*)	Managing Director of Chilwell National Filling Factory (—.8.15–25.4.19).
CHURCHILL, RT. HON. W. S., M.P.	Minister of Munitions (20.7.17–15.1.19).
CHURCHMAN, LT.-COL. SIR A. C., BT. 1917, M.P. (*British-American Tobacco Co., Ltd.*)	Controller of Mineral Oil Production (27.9.17–30.12.18).
COCKERELL, CAPT. L. M., O.B.E. 1920. (*War Office.*)	Mineral Resources Development Department (21.4.17); Director (—.6.18–24.4.19).
COLEFAX, SIR H. A., K.B.E. 1920, K.C 1912. (*Barrister-at-law.*)	Deputy Controller of Optical Munitions and Glassware (1.5.18); Controller (19.10.18–31.5.19).
COLLINSON, A. H., C.B.E. 1917, M.I.C.E. (*Consulting Engineer to Chinese Government Railways.*)	Director of Inspection of Munition Areas (29.6.15); Controller of Munitions Inspection (29.8.17–16.11.20).

COLLIS, E. L., M.B., M.R.C.S., L.R.C.P. (*Home Office.*)	Director of Welfare and Health (26.3.17–23.6.19); Chairman of Food Investigation Committee (30.7.17).
CORBETT, COL. A. .. .. (*War Office.*)	Legal Adviser to Committee on High Explosives (—.12.14); Explosives Supply Department (23.6.15); Controller of Explosives Supply (1.9.17–21.1.19); Chairman of Sulphuric Acid Advisory Committee (1918); Ministry representative on Phosphate Rock and Potash Distribution and on Sulphate of Ammonia Distribution Committees (1918).
CORMACK, BRIG.-GEN. J. D., C.B.E. 1919, C.M.G. 1917. (*War Office.*)	Representative of Ministry of Munitions and Air Board on Aeronautical Supplies in U.S.A. (29.8.17); Liquidator of American Aircraft Contracts (16.2.19–31.7.19).
CRIPPS, MAJ. THE HON. L. H., C.B.E. 1918. (*War Office.*)	Munitions Supply Department (—.6.15); Deputy Director-General of Central Stores (6.4.17); Assistant Controller (—.11.17); Controller (21.3.19–20.5.19).
CURRIE, BRIG.-GEN. A. C., C.B. 1918, C.M.G. 1916, R.A. (*War Office.*)	President of Trench Warfare Committee (26.1.17); Controller of Munitions Design (18.10.17–24.3.19).
DANNREUTHER, SIR SIGMUND, C.B. 1917, KT. 1919. (*War Office.*)	Director of Munitions Finance (12.7.15); Director-General (6.1.17); Controller (10.9.17); Assistant Financial Secretary (4.7.18–31.3.21); Accounting Officer to Disposal and Liquidation Commission (1.4.21).
DEWAR, MAJ. M. B. U., O.B.E. 1919, R.E., T.F.	Leeds National Shell Factory (1.7.15); Director of National Projectile Factories (28.11.16); Assistant Controller of Shell Manufacture (5.1.17); Controller of Statistics and Progress (6.3.18–21.3.19).
D'EYNCOURT, SIR E. H. W. TENNYSON, K.C.B. 1917. (*Admiralty.*)	Chairman of Landships Committee (22.2.15); Technical Adviser to Mechanical Warfare Supply Department (12.2.16–1918).
DONALDSON, SIR H. F., K.C.B. 1911. (*Chief Superintendent Ordnance Factories.*)	Chief Superintendent Ordnance Factories (1903); transferred to Ministry of Munitions in this capacity (23.8.15); Technical Adviser to Minister of Munitions (21.9.15); Mission to U.S.A. (29.9.15); Died (5.6.16).
DU CANE, LT.-GEN. SIR J. P., K.C.B. 1916. (*Chairman of Experiments Committee, G.H.Q.*)	Director-General of Munitions Design (3.12.15); Military Adviser to Minister (31.3.16–—.10.16).
DUCKHAM, ALEXANDER .. (*Messrs. Alexander Duckham & Co., Ltd.*)	Chief Investigation Officer, Labour Department (1915); Small Arms Ammunition Section, Munitions Supply Department (—.1.16); Deputy Director-General (E) (3.10.16); Director of Small Arms Ammunition and Controller of Small Arms and Machine Guns (—.11.17); Controller of National Aircraft Factories (—.12.17); Controller of American (Aircraft) Assembly (15.2.18–15.8.20).

DUCKHAM, SIR ARTHUR MC D., K.C.B. 1917. (*Messrs. Woodall-Duckham Co., Ltd.*)	Munitions Supply Department (2.7.15); Deputy Controller of Munitions Inventions (1915); Deputy Director-General (E) (12.1.16); Joint Chairman of Advisory Committee (3.10.16); Member of Munitions Council E (20.8.17); Member of Air Council (1917); Director-General of Aircraft Production (13.5.18–1.5.19).
DUCKWORTH, MR. G. H., C.B. 1919. (*Royal Commission on Historical Monuments.*)	Finance Department (5.10.15); Chairman of Canteens Finance Committee (12.3.17); Controller of Labour Finance (4.7.18–16.9.20).
DULANTY, J. W., C.B. 1920, C.B.E. 1918. (*Board of Education.*)	Inspection Department (12.11.15); Assistant Secretary in charge of Establishment (19.10.17–8.10.20).
EDGE, S. F. .. .. .. (*Messrs. Cunard Films, Ltd.*)	Director of Agricultural Machinery (4.1.17); Controller (16.8.17–18.10.17).
EDWARDS, LT.-COL. W. E., C.M.G. 1918. (*Assistant to Chief Inspector at Woolwich.*)	Inspector of Carriages (—.3.16); Assistant Deputy Director-General of Inspectors (14.4.16); Director of Inspection in Canada (22.11.16–15.6.19).
ELIBANK, 1ST VISCOUNT (cr. 1911), MONTOLIEU FOX OLIPHANT MURRAY.	Director-General of Recruiting for Munitions Work (23.11.15– —.2.16).
ELLINGTON, AIR VICE-MARSHAL E. L., C.B. 1919, C.B.E. 1919, C.M.G. 1916.	Director-General of Aircraft Production.
ELLIS, SIR CHARLES, K.C.B. 1917, G.B.E. 1919. (*Messrs. John Brown & Co.*)	Deputy Director-General (D), Munitions Supply Department (19.7.15); Director-General of Ordnance Supply (3.10.16); Acting Member of Council A (—.11.17); Head of Paris Establishment (13.12.17); President of Commission Anglaise de l'Armament (—.12.17); Liquidator of Contracts in France, Italy and Switzerland (1919).
ELPHINSTONE, 16TH BARON, SIDNEY HERBERT ELPHINSTONE.	Representative of Ministry of Munitions in House of Lords (1915–18).
ESSLEMONT, A. S., C.B.E. 1917. (*Teeside Industrial Development Association.*)	Director of Optical Munitions (28.6.15); Controller of Potash Production (8.6.17); Ministry representative of British Potash Co., Ltd. (8.4.18); Controller of Optical Munitions, Potash and Glassware (—.4.18–14.9.18).
EVANS, RT. HON. SIR L. WORTHINGTON, BT., M.P.	Parliamentary Secretary of Ministry of Munitions (28.12.16); Parliamentary and Financial Secretary (31.1.18–22.7.18).
FARMER, R. C., O.B.E. 1918, D.Sc., Ph.D. (*Research Department, Woolwich.*)	Consulting Chemist to Committee on High Explosives (—.3.15); Chief Chemical Adviser to Explosives Supply Department (23.6.15–3.3.19).
FIELDING, SIR C. W., K.B.E. 1917. (*Rio Tinto Company.*)	Chairman of Metals and Materials Economy Committee (29.11.16); Ministry representative on Sub-Committee of Restriction of Imports Committee (10.1.17); Chairman of Priority in Shipments Committee (7.5.17–1918); Chairman of Pyrites Sub-Committee.

FISHER, COL. F. T., C.B. 1915.. (*Superintendent of Waltham and Enfield.*)	Superintendent of Waltham and Enfield (1909); transferred to Ministry of Munitions in this capacity (23.8.15–8.11.17).
FLAVELLE, SIR J. W., BT. 1917 (*Messrs. William Davies Co., Ltd., Toronto, etc.*)	Chairman of Imperial Munitions Board, Canada (—.12.15 onwards).
FOWLER, SIR HENRY, K.B.E. 1918. (*Midland Railway Company.*)	Director of National Projectile Factories, Munitions Supply Department (—.7.15); Deputy Controller of Shell Manufacture (9.9.16); Assistant Director-General of Aircraft Production (22.12.17); Superintendent of Royal Aircraft Factory (—.9.16); Deputy to Member of Council O (25.10.18–16.4.19).
FRANK, SIR HOWARD, K.C.B. 1918, BT. 1920, KT. 1914, F.S.I. (*Messrs. Knight, Frank and Rutley.*)	Director-General of Lands, War Office, Ministry of Munitions and Air Ministry (8.2.17); Deputy Chairman of Surplus Government Property Disposal Board (10.2.19); Chairman (29.4.20); Chairman of Disposal and Liquidation Commission (1.4.21).
FRY, E. H.	Munitions Supply Department (24.2.16); Director of Munitions Petroleum Supplies (31.1.17–3.2.19).
GARNSEY, SIR G. F., K.B.E. 1918, F.C.A., F.S.S. (*Messrs. Price, Waterhouse & Co., Ltd.*)	Financial Adviser to Controlled Establishments Division (27.3.16); Head of Internal Audit Section (31.3.17); Assistant Controller of Finance (—.11.17); Controller of Munitions Accounts (—.2.18–16.11.18); Chairman of Co-ordinating Finance Committee and Member of Munitions Council (27.9.18); Chairman of Departmental Board for Liquidation of Contracts (16.11.18–24.7.19).
GEDDES, RT. HON. SIR E. C., G.C.B. 1919, G.B.E. 1917, KT. 1916. (*North Eastern Railway Company.*)	Deputy Director-General (C), Munitions Supply Department (—.6.15); responsible for Gun Ammunition Filling (—.1.16–28.9.16).
GEORGE, RT. HON. D. LLOYD, O.M., M.P.	Minister of Munitions (9.6.15–7.7.16).
GIBB, M. S., C.B.E. 1920 .. (*Central Marine Engine Works, West Hartlepool.*)	Munitions Supply Department (5.1.16); Head of Railway Materials Supply Section (30.5.16); Ministry representative at Birtley National Projectile Factory (4.12.16–16.1.19).
GIBSON, J. W., O.B.E. 1918 .. (*Messrs. S. Pearson & Son.*)	Director of Gun Ammunition, American Branch (1916); Technical Assistant to Director-General of Munitions Supply (—.1.17); Director of Aeronautical Requirements and Statistics (—.6.17–28.2.19).
GIROUARD, MAJ.-GEN. SIR PERCY, K.C.M.G. 1900, D.S.O., R.E., F.R.C.I. (*Messrs. Sir W. G. Armstrong, Whitworth & Co.*)	Member of Munitions of War Committee (26.4.15); appointed joint head of Special Organisation at War Office to increase Munitions Production (28.4.15); Director-General of Munitions Supply (5.6.15–26.7.15).

GLAZEBROOK, SIR R. T., C.B. 1910, KT. 1917, F.R.S. (*Director of National Physical Laboratory.*)	Director of National Physical Laboratory (1899 onwards).
GOOLD-ADAMS, COL. SIR H. E. F., C.B. 1916, K.B.E. 1918, C.M.G. 1901, R.A. (*Member of Ordnance Board.*)	Acting Controller of Munitions Inventions (13.12.15 ; Controller (3.10.16–20.1.18) ; Chairman of Electro-Metallurgical Committee (29.4.18–28.2.19).
GORDON, SIR C. B., G.B.E. 1918, (*Dominion Textile Co., Ltd., etc.*)	Vice-Chairman of Imperial Munitions Board (—.12.15) ; Representative of Ministry of Munitions in U.S.A. (2.6.17) ; Liquidator of U.S.A. contracts (4.1.19).
GORDON, L., C.B.E. 1918 .. (*Messrs. Kynoch, Ltd.*)	Small Arms Ammunition Section, Munitions Supply Department (25.6.15) ; Controller of Small Arms Ammunition (15.2.18) ; Liquidator (4.1.19–31.5.19).
GREENE, SIR W. GRAHAM, K.C.B. 1911. (*Secretary of the Admiralty.*)	Secretary of the Ministry of Munitions and Member of Munitions Council (5.8.17–30.9.20).
GREER, CAPT. A. U., O.B.E. 1918. (*4th Yorkshire Regiment.*)	Salvage Section, Munitions Supply Department (2.8.15) ; Assistant Controller of Salvage (1917) ; Deputy-Controller(1.8.18).
GREER, H., M.P.	Director of Transit Boxes (4.9.18–13.12.18).
GRIDLEY, SIR ARNOLD, K.B.E. 1920. (*Northern Counties Electricity Supply Co., Ltd.*)	Director of Electric Power Supply (4.9.17–28.4.19).
GUEDALLA, H. .. .. .. (*Imperial and Foreign Corporation, Ltd.*)	Controller of Commercial Finance (22.5.18).
GUY, J. H. .. .. .. (*Messrs. Price, Waterhouse & Co., Ltd.*)	Deputy Director of Munitions Accounts (13.11.16) ; Internal Audit Section (31.3.17) ; Assistant Controller of Finance (16.11.17) ; Assistant Financial Secretary (1.4.18–15.5.19).
HAIGH, E. V., C.B.E. 1918. (*Messrs. J. & P. Coats, Ltd.*)	Trench Warfare Supply Department (10.6.15) ; Controller of Trench Warfare Supplies (18.10.17) ; Controller of Engineering Department (3.7.18–10.5.20).
HALSE, LT.-COL. S. C., C.M.G. 1918. (*Assistant Superintendent, Enfield.*)	Rifle Section, Munitions Supply Department (28.12.15) ; Deputy Superintendent, Enfield (1.1.16) ; Deputy Controller of Small Arms and Machine Gun Supply (29.11.17) ; Controller (15.2.18) ; Liquidator for Small Arms and Machine Guns (4.1.19–30.4.20).
HAMBLING, SIR HERBERT, KT. 1917. (*Messrs. Barclays Bank, Ltd.*)	Member of Munitions Council F (1917–—.1.18).
HANSON, SIR PHILIP, C.B. 1917, KT. 1920. (*Dublin Office of Works.*)	Director of Munitions Contracts (5.7.15) ; Director-General (28.3.17) ; Assistant Secretary in charge of American Branch (10.9.17–31.5.19).

HARKER, J. A., O.B.E. 1918, D.Sc., F.R.S. (*National Physical Laboratory.*)	Organising work of Nitrogen Products Committee (1916); Director of Research, Inventions Department (1916–19).
HARTLEY, BRIG.-GEN. H., C.B.E. 1919, M.C., R.E. (*Gas Services, G.H.Q.*)	Controller of Chemical Warfare Department (22.11.18); Liquidator to Chemical Warfare Department (19.1.19–30.6.19).
HENRIQUES, SIR P. G., K.B.E. 1918. (*Barrister-at-Law.*)	Assistant Director of Explosives Finance (13.7.15); Deputy Director-General of Explosives Contracts and Finance (6.1.17); Assistant Financial Secretary (4.7.18 onwards).
HERBERT, SIR ALFRED, K.B.E. 1917. (*Messrs. Alfred Herbert, Ltd.*)	Head of Machine Tool Section at War Office under Sir Percy Girouard and Mr. Booth (27.4.15); Director of Machine Tools (5.6.15); Deputy Director-General (14.8.16); Controller (—.11.17); transferred to Engine Branch, Aeronautical Supply Department (23.3.18–1919).
HILLS, MAJ. J. W., M.P. ..	Member of Munitions Committee L (19.10.17); Additional Member of Council (13.12.17–9.4.18).
HOLBROOK, LT.-COL. C. V., C.B.E. 1920. (*War Office.*)	Director of Mechanical Transport Inspection (26.8.16); Director of Mechanical Transport Supply (8.11.17); Ministry representative on Committee for Disposal of Obsolete Aero-Engines (27.9.18); Controller of Mechanical Transport Section of Disposal Board (1919–21.1.20).
HOLDEN, BRIG.-GEN. SIR H. C. L., K.C.B. 1916, F.R.S., M.I.E.E., R.A. (*War Office.*)	Director of Mechanical Transport Supply for British Forces (9.10.16); Deputy Controller of Mechanical Transport Supply (10.4.17); Technical Adviser (8.11.17–24.3.19).
HOLLAND, SIR R. SOTHERN, BT. 1917, KT. 1912, J.P. (*Trade Commission, South Africa.*)	High Explosives Branch at War Office (1.1.15); Deputy Director-General of Explosives Supply (23.6.15); Director-General of Munitions Inspection (25.3.16–27.8.17).
HOLLOWAY, SIR H., KT. 1917, J.P. (*Messrs. Holloway Bros., Ltd.*)	Director of Housing Construction (29.10.15–23.1.17).
HOPE, J. F., M.P.	Financial Secretary to Ministry of Munitions (15.2.19 onwards).
HOWARD, F. J., O.B.E. 1918 .. (*War Office.*)	High Explosives Branch at War Office (1.1.15); Explosives Finance Department (23.6.15); Assistant Controller of Departmental Finance (1917 onwards).
HUNTER, SIR JOHN, K.B.E. 1917 (*Messrs. Sir W. Arrol & Co.*)	Director of Factory Construction (22.10.15); Director of Iron and Steel Production (14.8.16); Member of Munitions Council S (20.8.17–15.7.19); Administrator of Works and Buildings Air Ministry (3.1.18); Member of Air Council (12.2.19).

Iliffe, E. M., C.B.E. 1918 .. (*Messrs. Iliffe & Sons, Ltd.*)	Machine Tool Department (7.7.15) ; Assistant Controller (1917) ; Controller (23.3.18) ; Liquidator of Machine Tool Contracts (4.1.19–30.6.19).
Inverforth, 1st Baron (cr. 1919), Andrew Weir, P.C. 1919. (*Messrs. Andrew Weir & Co.*)	Surveyor-General of Supply, War Office (2.4.17–13.1.19) ; Minister of Munitions and Supply (14.1.19–31.3.21) ; Chairman of Disposal and Liquidation Commission (1.4.21—31.5.21).
Jackson, Sir Herbert, K.B.E. 1917, F.R.S. (*King's College, London.*)	Chemical Adviser to Optical Munitions and Glassware Department (1917) ; Director of British Potash Co., Ltd. (8.4.18–1.6.19).
Jackson, Brig.-Gen. Sir L. C., C.B. 1917, K.B.E. 1918, C.M.G. 1906. (*War Office.*)	Director-General of Trench Warfare Supply (23.6.15) ; Controller of Trench Warfare Research (—.12.15–1.12.17).
Japp, Sir Henry, K.B.E. 1918 (*Messrs. S. Pearson & Son, Ltd.*)	Progress Officer in U.S.A. (5.7.15) ; Deputy Director-General for U.S.A. (18.1.17 onwards).
Jenkinson, M. Webster, C.B.E. 1918. (*Chartered Accountant.*)	Finance Department (27.10.15) ; Director of Factory Accounting (6.1.17) ; Controller of Factory Audit and Costs (—.11.17–16.6.20).
Jones, Sir Edgar R., K.B.E. 1918, M.P.	Priority Section, Munitions Supply Department (28.6.15) ; Controller of Priority (24.2.17–18.7.18).
Judd, T. L., C.B.E. 1920 .. (*Messrs. J. Earle, Hodges, Wright, Judd & Co.*)	Assistant Accountant, Finance Department (24.11.16) ; Deputy Controller of Munitions Accounts (2.7.18–4.10.19).
Keenlyside, R. H. H., O.B.E. 1918.	Labour Regulation Department (25.6.15) ; Assistant Secretary in charge of Parliamentary and General Department (19.6.18–26.11.18).
Kellaway, Rt. Hon. F. G., M.P.	Parliamentary Private Secretary to Dr. Addison (7.7.15) ; Parliamentary Secretary of the Ministry of Munitions (28.12.16) ; Parliamentary and Financial Secretary (21.10.18–10.4.20) ; Chairman of Establishments Advisory, Accommodation, Military Service, Food Advisory and Admiralty and Munitions Joint Labour Committees (1918) ; Chairman of Surplus Government Property Disposal Board (10.2.19).
Kelly, Capt. R., M.B.E. 1918	Special Organisation at War Office for increase of Munitions Production (—.4.15) ; Munitions Supply Department (5.6.15) ; Joint Director of Munitions in Ireland (2.11.15) ; Director of Central Clearing House (3.10.16) ; Deputy Controller Engineering Department (6.3.18–25.8.19).
Kent, Sir Stephenson, K.C.B. 1917. (*Messrs. Stephenson, Clark & Co.*)	Chief Investigation Officer, Labour Department (27.11.15) ; Director-General Labour Supply Department (9.10.16) ; Member of Council L (20.8.17–1919) ; Ministry representative on permanent Sub-Committee of War Priorities Committee.
Kenyon, Brig.-Gen. L. R., C.B. 1917. (*Indian Ordnance Department.*)	Director of Inspection in U.S.A. (2.2.17–6.5.18).
Knight, Lt.-Col. C. M., O.B.E. 1919, D.S.O.	Director of Military Establishment Branch (11.12.16–31.7.19).

LARKE, W. J., C.B.E. 1920 .. (*British Thomson-Houston Co.*)	Labour Supply Department (—.6.15); Director of Dilution and Allocation (8.1.17); Special Service in connection with Demobilisation and Reconstruction (15.3.18); Director-General of Raw Materials, Disposals Board (1.3.19 onwards).
LAWN, J. G., C.B.E. 1920 .. (*Johannesburg School of Mines.*)	Technical Officer, Explosives Supply Department (5.8.15); Consulting Chief Inspector (1916); Director of Explosives, Statistical Section and Chief Technical Adviser (1917); Controller of Explosives Supply (4.1.19–17.2.19).
LAYTON, W. T., C.H. 1919, C.B.E. 1917. (*Cambridge University.*)	Director of Statistics (11.6.15); Director of Requirements and Statistics (23.7.15); Secretary for Requirements and Statistics (6.7.17); Member of Munitions Council R (19.11.17–31.3.19); Ministry representative on Milner Mission to Russia and on Balfour Mission to U.S.A. (1917); Chairman of Committee to consider probable demand and supply of steel during demobilisation period (29.3.18); Ministry representative on Inter-Allied Departmental Committee on Reconstruction Requirements (11.11.18); Chairman of Committee to consider organisation of Ministry of Supply (7.3.19).
LE BAS, SIR HEDLEY F., KT. 1916. (*Caxton Publishing Co., Ltd.*)	Director of Special Intelligence (18.10.16–1.10.17).
LEE, 1ST BARON (cr. 1918), ARTHUR HAMILTON, P.C. 1919, G.B.E. 1918, K.C.B. 1916.	Parliamentary Military Secretary to Ministry of Munitions (5.6.15–10.7.16).
LEEMING, CAPT. J. A., O.B.E. 1918, R E. (170*th Tunnelling Company.*)	Director of Outside Engineering Branch (1.6.15); Balfour Mission to U.S.A. (14.4.17); transferred to National Shipbuilding Yards (12.3.18); Director of Ropeways Section, Railway Materials Branch (8.8.18–5.10.18).
LEVER, SIR S. H., K.C.B. 1917 (*Messrs. Lever, Anyon, Honeyman & Spence.*)	Financial Adviser on stores records and cost accounting, Munitions Supply Department (26.8.15); Assistant Financial Secretary (29.10.15– —.1.17); Chairman of Finance Committee on Economy (—.1.16).
LEWIS, P. G. .. .. (*Bute Docks Supply Co.*)	Raw Materials Section, Munitions Supply Department (29.12.15); Coke Section, Iron and Steel Production Department (7.2.17); Director of Munitions Coal Supply (—.6.18–30.4.19).
LLEWELYN, SIR L. W., K.B.E. 1917. (*Cambrian Coal Combine.*)	Director of Raw Materials (14.6.15); Deputy Director-General (14.8.16); Controller of Non-Ferrous Metals (1.9.17–1.2.19); Ministry representative on Australian Purchases Committee (28.10.18).
LLOYD, G. I. H. .. .. (*Toronto University.*)	Department of Requirements and Statistics (19.7.15); Director and Editor of Historical Records (15.5.18–31.12.19); Secretary to Demobilisation and Reconstruction Committee (—.11.18).

LOBNITZ, SIR F., K.B.E. 1920, D.L., J.P. (*Messrs. Lobnitz & Co.*)	Deputy Director of Munitions in Scotland (—.12.15) ; Director (1.1.17–11.11.18).
LOWRY, T. M., C.B.E. 1920, D.Sc., F.R.S. (*Guy's Hospital Medical School.*)	Technical Adviser on Ammonium Nitrate Mixtures (22.9.15– —.8.19).
MCDOWELL, A., C.B.E. 1917 ..	Joint Director of Munitions in Ireland (2.11.15–17.3.18).
MCLAREN, HON. H. D., C.B.E. 1918, M.P. (*Messrs. Palmers' Shipbuilding and Iron Company, etc.*)	Area Organisation Department (1915) ; Deputy Director of Area Organisation (3.10.16) ; Chairman of Board of Management Executive Committee (16.4.17) ; Director of Area Organisation (1917) ; Liquidator for Area Organisation (4.1.19–15.4.19).
MACLEAN, J. B., C.B.E. 1918, M.I.N.A. (*Messrs. Blandy Bros.*)	Shell Manufacture Department (3.2.16) ; Deputy Director-General of Gun Manufacture (8.7.17) ; Controller (20.8.17) ; Controller of Engineering Department (6.3.18) ; Controller of Mechanical Warfare Supply (7.8.18–30.5.19).
MCLELLAN, CAPT. W. .. .. (17*th Northumberland Fusiliers.*)	Electric Power Section, Munitions Supply Department (10.8.15) ; Director of Electric Power Supply (8.7.17–3.9.17).
MALCOLM, D. O. .. .. (*British South Africa Company.*)	Labour Department (1.6.15–23.10.15).
MANN, SIR JOHN, K.B.E. 1918 (*Messrs. Mann, Judd, Gordon & Co.*)	Financial Adviser to Ministry of Munitions (—.8.15) ; Assistant Financial Secretary and Chairman of Finance Board (6.1.17) ; Controller of Munitions Contracts (10.9.17–21.5.19) ; Chairman of Joint Committee of Contracts and Finance Officers of Admiralty, War Office and Ministry of Munitions (1918) ; Chairman of Munitions Contracts Board; Ministry representative on Interdepartmental Committee on Contracts.
MARTEL, BRIG.-GEN. C. P., C.B. 1916, R.A.	Chief Superintendent Ordnance Factories (1917 onwards).
MARTIN, P. .. .. .. (*Birmingham Small Arms Co., Ltd.*)	Controller of Petrol Engine Supply and Member of Air Board (6.2.17) ; Director-General of Mechanical Transport Supply and Petrol Engines (26.2.17) ; Controller of Mechanical Transport Supply (16.5.17–—.1.18).
MASTERTON-SMITH, SIR J. E., K.C.B. 1919. (*Admiralty.*)	Assistant Secretary to Ministry of Munitions (11.9.17–31.1.19).
MILES, SIR J. C., KT. 1919 .. (*Barrister-at-Law.*)	Legal Adviser to Labour Department (29.6.15–1918).
MILMAN, BRIG.-GEN. L. C. P., C.M.G. 1917, R.A. (*Ordnance Stores, Woolwich Arsenal.*)	Munitions Supply Department (10.1.16) ; Deputy Director-General of Gun Ammunition Filling (9.9.16) ; Controller (3.11.16–18.3.19).

MINCHIN, BRIG.-GEN. F. F., C.B. 1917, D.S.O. (*Director of Ordnance Inspection, India.*)	Military Technical Adviser to Director-General of Munitions Supply (28.7.15); Military Adviser to Minister (19.10.15); Deputy Director-General of Inspection (3.12.15); Mission to U.S.A. to reorganize inspection (5.4.16); Mission to India (16.10.17–18.11.18).
MOIR, SIR E. W., BT. 1916, M.I.C.E. (*Messrs. S. Pearson & Son.*)	Munitions Supply Department (—.7.15); Controller of Munitions Inventions (9.8.15); Ministry Representative in U.S.A. (13.12.15); Director-General of American & Transport (3.10.16); Member of Munitions Council M (20.8.17–1919); Ministry representative on Road Transport Board, Canal Control Committee, Tonnage Priority Committee and Joint Committee of Railway Executive and Government Departments.
MONTAGU, RT. HON. E. S., M.P.	Minister of Munitions (12.7.16–11.12.16).
MOORE, VICE-ADMIRAL SIR A. G. H. W., K.C.B. 1914, C.V.O. 1909. (*Admiralty.*)	Controller of Mechanical Warfare Supply (19.10.17–4.8.18).
MORTIMER, W. E. .. .. (*Messrs. Slaughter and May, Solicitors.*)	Legal Adviser to Finance Department (1.1.18); Controller of Aircraft Finance (17.6.18–1.3.19).
MOULTON, RT. HON. LORD, K.C.B. 1915, G.B.E. 1917. (*Committee on the Supply of Chemical Products.*)	Chairman of Committee on High Explosives (15.11.14); Director-General of Explosives Supply (23.6.15); Adviser on Explosives Supply (1.9.17–30.6.19).
MUNRO, SIR THOMAS, G.B.E. 1920, D.L. (*Clerk to Lanark District Board of Control.*)	Chief Adviser, Labour Regulation Department (30.7.17–12.2.19); Chairman of Consultative Committee to advise Ministry and Admiralty on labour questions (17.10.18).
NATHAN, COL. SIR FREDERIC, K.B.E. 1918. (*Royal Naval Factory, Poole.*)	Director of Propellant Supplies (—.12.15–30.6.19); Superintendent of Waltham Abbey (15.1.18–30.6.19).
NEWMAN, SIR G., K.C.B. 1918, KT. 1911, M.D., F.R.S.E., F.R.C.P. (*Board of Education.*)	Chairman of Health of Munition Workers' Committee (—.9.15–1918).
NICOL, SIR T. D., K.B.E. 1920 (*Messrs. Cammell, Laird & Co.*)	Finance Department (7.3.17); Director of Mechanical Transport Contracts; Controller of Aircraft Contracts (1.11.17); Chairman of Liquidation of Aircraft Contracts Committee (22.11.18– —.6.20).
OGILVIE, COMDR. A., O.B.E. 1919, R.N.A.S.	Assistant Controller (Design), Aircraft Production Technical Department (31.3.18–1.3.19).
OGILVIE, LT.-COL. G., C.M.G. 1918. (*Ammunition Inspector, Department of Militia, Canada.*)	Chief Inspector of Munitions in Canada (6.12.15–26.3.19).
PAGE, W. M., C.B.E. 1918 .. (*Board of Education.*)	Department of Requirements and Statistics (1915); Assistant Secretary in charge of Requirements (1917–31.11.20).
PALMER, F., C.I.E., M.I.C.E., F.R.G.S. (*Messrs. Rendel, Palmer and Tritton.*)	Director-General of Contracts Finance (6.1.17); Chairman of Munitions Works (23.1.17–4.6.17).

PEGG, H. CARTER .. .. (*Architect.*)	Controller of Building Bricks (1.3.18–3.3.19).
PERRY, SIR P. L. D., K.B.E. 1918. (*Messrs. Henry Ford & Son, Ltd.*)	Director of Manufacturing Branch, Agricultural Machinery Department (24.4.17); Deputy Controller of Mechanical Warfare (21.3.18–16.6.19).
PHILIPPS, MAJ.-GEN. SIR IVOR, K.C.B. 1917, D.S.O., M.P.	Parliamentary Military Secretary to Ministry of Munitions (17.6.15–21.9.15).
PHILLIPS, SIR LIONEL .. .. (*Messrs. Wernher, Beit & Co.*)	Controller of Mineral Resources Development (20.3.17– —.6.18); Ministry Representative on Tin and Tungsten Research Board.
PHIPPS, LT.-COL. C. E., C.B. 1916, R.G.A. (*Inspector, Royal Arsenal.*)	Chief Inspector of Munitions, U.S.A. (30.12.14– —.6.16); Director of Safety of Factories Branch (7.10.16–3.10.20).
PHIPPS, SIR E. B., C.B. 1916, KT. 1918. (*Board of Education.*)	General Secretary to Ministry of Munitions (6.3.16–30.9.17).
PIGGOTT, H. H., C.B. 1919, C.B.E. 1918. (*H. M. Inspector Board of Education.*)	Department of Requirements and Statistic (20.7.15); Private Secretary to Minister (9.8.17); Assistant Secretary to Ministry (12.10.17); Assistant Secretary in charge of Demobilisation and Reconstruction (—.5.18–14.12.19).
POTTS, W. T., C.B.E. 1920 ..	Director of Forwarding (16.4.17–24.5.19); Ministry representative on Port and Transit Executive Committee (15.3.18).
PRICE, SIR KEITH, KT. 1917 .. (*Messrs. Price & Pierce.*)	Director of Raw Materials, Committee on High Explosives (—.12.14); Explosives Supply Department (23.6.15); Deputy Director-General (25.3.16); Member of Munitions Council X (20.8.17–14.3.19); Chairman of Explosives and Chemical Allocation Sub-Committee.
PRIMROSE, HON. NEIL, M.P. ..	Parliamentary Secretary (12.9.16–14.12.16).
QUINAN, K. B., C.H. 1917 .. (*Cape Explosive Works, Ltd.*)	Technical Adviser and Superintendent of Construction, Explosives Supply Department (—.2.15); Director of Factories Branch, Explosives Supply Department (15.6.15–17.2.19).
RAINFORTH, W. F. .. .. (*London General Omnibus Company.*)	Director of Mechanical Transport Supply (8.5.16); Engineering Director, Agricultural Machinery Department (1.9.17–22.11.17).
RAVEN, SIR VINCENT, K.B.E. 1917, M.I.C.E., M.I.M.E. (*North Eastern Railway Company.*)	Administration of Royal Ordnance Factories, Munitions Supply Department (23.8.15); Chief Superintendent Ordnance Factories (21.9.15– —.6.17).
REDWOOD, SIR BOVERTON, BT. 1911, F.R.S.E., M.I.M.E. (*Petroleum Executive.*)	Trench Warfare Scientific Advisory Committee (1915); Director of Petroleum Research (6.7.17 onwards).
REY, C. F. .. .. .. (*Board of Trade.*)	Director of Munition Workers' Enrolment (18.6.15); Director of Labour Supply (—.10.15); Assistant General Secretary (22.11.15–9.10.16).
ROBERTSON, SIR ROBERT, K.B.E. 1918, D.Sc., M.A., F.R.S. (*Research Department, Woolwich.*)	Superintending Chemist, Research Department, Woolwich (1907–19); Director of Explosives Research (1919 onwards).

ROBERTSON, R. .. .. .. (*London County Council.*)	Housing Branch (17.4.16) ; Director of Housing Construction (23.1.17–30.4.19).
ROGER, SIR ALEXANDER, KT. 1916. (*Omnium Investment Company.*)	Financial Adviser to Director-General of Trench Warfare Supply (23.6.15) ; Director-General of Trench Warfare Supply (20.12.15–10.11.17).
ROWNTREE, B. S., J.P. .. (*Messrs. Rowntree & Co., Ltd.*)	Director of Welfare (27.12.15–26.3.17).
RYAN, M. F., C.B.E. 1918 .. (*London and South-Western Railway Company.*)	Gauges Section, Munitions Supply Department (—.6.15) ; Director of Gauges (1917); Liquidator (4.1.19–31.3.19).
SAVILE, BRIG.-GEN. W. C., C.B. 1917, D.S.O.	High Explosives Branch, War Office (1.1.15) ; Military Adviser to Explosives Supply Department (26.6.15–16.10.19).
SAWYER, E. E. .. .. .. (*British Aluminium Co., Ltd., etc.*)	Ministry representative in Switzerland (—.9.15) and in Rome (30.7.18–1919).
SCOTT, A. MACCALLUM, M.P. ..	Parliamentary Private Secretary to Minister of Munitions (9.8.17–15.1.19) ; Chairman of Standing Committee on Publicity (6.7.18) ; Deputy Chairman of Military Service Committee (1918).
SCOTT, MAJ. F. J.	Release from Colours Section Labour Department (—.6.15–15.9.16).
SEELY, MAJ.-GEN. RT. HON. J. E. B., C.B. 1916, C.M.G. 1918, D.S.O., M.P.	Member of Munitions Council W (13.7.18) ; Parliamentary Under-Secretary to Ministry and Deputy Minister (22.7.18–13.1.19) ; Chairman of Tank Board (1.11.18).
SHAW, W. B., C.B.E. 1919 .. (*Engineer.*)	Consultant Engineer, Factory Construction Branch (1.11.15) ; Director (—.1.18–31.5.19).
SKINNER, SIR H. ROSS, KT. 1917, M.I.C.E., M.I.M.M. (*South African Gold Mining Company.*)	Director of High Explosives Contracts under Lord Moulton (1915) ; Explosives Supply Department (23.6.15) ; Director-General of Munitions Inspection (25.3.16–27.8.17).
SMITH, SIR H. LLEWELLYN, G.C.B. 1919. (*Board of Trade.*)	General Secretary to Ministry of Munitions (31.5.15–9.10.16).
SMITH, J. C., C.B.E. 1918 .. (*Scotch Education Department.*)	Wages Section, Labour Department (20.10.15); Chief Director of Wages (2.5.17–5.6.18).
SMITH, OWEN H. .. .. (*British Thomson-Houston Co., Ltd., etc.*)	Controlled Establishments Division (21.6.15) ; Assistant General Secretary (11.4.16–31.10.18).
SPICER, GRAHAM P. .. .. (*Messrs. Spicer Bros.*)	Labour Supply Department (1.7.15) ; Belgian Labour Section (1916) ; Liaison Officer with Belgian Government (29.10.16–3.11.18.)
STANLEY, RT. HON. SIR ALBERT, KT. 1914. (*American Electric Railways Company.*)	Director-General of Mechanical Transport Supply (1.9.16–13.12.16).
STANSFELD, LT.-COL. J. R., C.B. 1917, C.B.E. 1919, R.A. (*Chief Inspector, Woolwich.*)	Chief Inspector, Woolwich ; transferred in this capacity to Ministry of Munitions (5.7.15) ; Deputy Director-General of Inspection (25.3.16) ; Ministry representative on Committee of Imperial War Museum (1918 onwards).

STERN, LT.-COL. SIR A. G., K.B.E. 1918, C.M.G. 1917. (*Messrs. Stern Bros.*)	Armoured Cars Division, R.N.A.S. (6.12.14); Secretary to Landships Committee, Admiralty (16.6.15); Chairman of Tank Committee (12.2.16); Director-General of Mechanical Warfare Supply (26.10.16); Commissioner of Mechanical Warfare Supply, Overseas and Allies (20.11.17–1.8.19).
STEVENS, C. H., C.B.E. 1917, M.I.N.A. (*Messrs. Blandy Bros. & Co.*)	Munitions Supply Department (10.6.15); Deputy Director-General of Shell Manufacture (8.7.17); Controller (20.8.17–16.2.19); Chairman of Italian Requirements Committee; Vice-Chairman of Statistical Conference.
STEVENSON, SIR JAMES, BT. 1917. (*Messrs. John Walker & Sons, Ltd.*)	Director of Area Organisation (24.8.15); Chairman of Executive Committee for Administration of National Shell Factories (31.5.16); Vice-Chairman of Advisory Committee (3.10.16); Member of Munitions Council P (20.8.17); Chairman of Council Committee on Demobilisation and Reconstruction (14.11.17); Member of Munitions Council O (16.2.18–13.1.19).
STEWART, CAPT. V. B., C.B. 1919, C.B.E. 1920. (*Messrs. Beardmore & Co.*)	Shell and Gun Manufacture Department (15.6.17); Assistant Controller of Gun Manufacture (—.11.17); Controller (6.3.18); Liquidator and Controller of Railway Materials (28.12.18–24.2.19).
STEWART-WILSON, SIR CHARLES, K.C.I.E. 1911. (*Indian Civil Service—retired.*)	Area Organisation Department (1915); Chairman of Priority Committee and Railway Materials Priority Committee; Secretariat (—.10.17–2.10.19).
STRANGE, MAJ. H. B. .. .. (*Messrs. T. Firth & Sons, Ltd.*)	Director of Gun Ammunition Filling (17.7.15–26.2.16).
STRODE, E. D. CHETHAM, C.B.E. 1920. (*Barrister-at-Law.*)	Legal Adviser to the Ministry of Munitions (12.7.15–13.1.19).
SYMON, LT.-COL. W. C., C.M.G. 1917. (*Messrs. Vickers, Ltd.*)	Gun Section, Munitions Supply Department (21.6.15); Deputy Director-General of Gun Manufacture (20.12.16); Technical Adviser (8.7.17–2.3.19); British Artillery Mission to U.S.A. (—.2.18).
TAYLOR, T. M., C.B.E. 1917 .. (*Wren's College.*)	Training Section, Labour Department (16.8.15); Deputy Controller of Labour Supply (1917); Director of Labour Supply (Civil) (15.2.18–16.11.18).
THUILLIER, MAJ.-GEN. H. F., C.B. 1916, C.M.G. 1916, M.V.O.	Controller of Chemical Warfare Department (11.10.17–28.10.18).
UNDERDOWN, H. C. B. .. (*Commercial Cars, Ltd., etc.*)	Director of Agricultural Machinery (18.10.17); Liquidator (4.1.19–24.2.19); Chairman of Agricultural Machinery Allocation Sub-Committee of War Priorities Committee.
VERNON, R. V. .. .. .. (*Treasury.*)	Secretariat (—.7.15); Assistant General Secretary in charge of Parliamentary and General Department (11.4.16–27.5.18).

WALKER, SIR ALEXANDER, K.B.E. 1920. (*Messrs. John Walker & Sons, Ltd.*)	Director of Scrap Metals (20.2.17); Controller of Salvage and Stores (19.11.17–—.7.19); Chairman of Timber Priority Committee (24.11.17); Ministry representative on National Salvage Council (8.3.18); Chairman of Raw Materials Committee and Member of Disposal Board (30.6.19).
WATSON, A. E., C.B.E. 1920 .. (*War Office.*)	Finance Department (19.7.15); Controller of Departmental Finance (4.7.18–1.12.19).
WEBB, P. G. L., C.B. 1919, C.B.E. 1918.	Establishment Branch, Labour Department (1.6.15 onwards).
WEDGWOOD, BRIG.-GEN. R. L., C.B. 1918, C.M.G. 1917. (*Railway Operating Division, France.*)	Supply of special munitions, Munitions Supply Department (20.6.15); Director of Optical Munitions and Railway Transport (8.1.16–17.10.16).
WEIR, 1ST BARON (cr. 1918), WILLIAM DOUGLAS, P.C. 1919. (*Messrs. G. & J. Weir, Ltd.*)	Director of Munitions in Scotland (—.7.15); Controller of Aeronautical Supplies and Member of Air Board (6.2.17); Director-General of Aircraft Production (13.12.17); Member of Air Council (3.1.18); Member of Munitions Council A (—.1.18–27.4.18).
WEIR, BRIG.-GEN. J. G., C.M.G. 1918, C.B.E. 1919. (*Royal Air Force.*)	Assistant Controller of Aircraft Supply (1.5.17); Controller of Aircraft Technical Department (22.12.17–7.3.19).
WEST, SIR G. H., KT. 1916 .. (*Messrs. Sir W. Armstrong, Whitworth & Co.*)	Deputy Director-General (A) in charge of Shell Manufacture, etc. (—.6.15); Controller (9.9.16); Chairman of Area Organisation and of National Projectile Factories Executive Committees (5.1.17); Director-General of Shell and Gun Manufacture (30.5.17); Member of Munitions Council G (20.8.17–3.2.18).
WILD, BRIG.-GEN. R. K. BAGNALL, C.M.G. 1918, C.B.E. 1919. (*Chief Inspector of Aeronautics.*)	Controller of Aircraft Inspection (—.4.17–—.1.20).
WILLIAMS, H., C.B.E. 1918 .. (*London and North-Western Railway Company.*)	Forwarding and Delivery Section, Munitions Supply Department (20.9.15); Deputy Director of Railway Transport (29.2.16); Director (16.10.16); Director of Inland Transport (1917–28.9.18).
WOLFE, H., C.B.E. 1918 .. (*Board of Trade.*)	Director of General Section, Labour Department (—.10.15); Deputy Assistant General Secretary (9.10.16); Controller of Labour Regulation (1917–16.11.18); Chairman of Hours of Labour Committee; Ministry representative on Civil War Workers' Demobilisation Committee.
WORMALD, SIR J., K.B.E. 1919. (*Messrs. Mather & Platt.*)	Chairman of Priority Advisory Committee (24.2.17); Chairman of Allocation of Urgent Supplies Board (8.7.17–28.2.18).
WRIGHT, COL. SIR W. C., C.B. 1918, K.B.E. 1920. (*Port Talbot Steel Co., Ltd., etc.*)	Raw Materials Department (1915); Controller of Iron and Steel Production (27.9.17–1919); Chairman of Steel Allocation Home Ore Supply and Central Steel Advisory Committee.

APPENDIX IX.

List of Principal Abbreviations in use in the Department.

A.	Aircraft Group of the Munitions Council.
A 6	Explosives Branch under the Director of Artillery, War Office
A.7	MunitionsContracts Branch under the Director of Artillery.
A.A.	Artificers' Allocation.
A.F.1, 2, etc. ..	Branches of the Aircraft Finance Department.
A.F.S.	Assistant Financial Secretary.
A.M.1, 2, etc. ..	Branches of the Shell Manufacture Department.
A.M.S.B.	Agricultural Machinery Supply Branch.
A.R.M.W.	Army Reserve Munitions Workers.
B.M.1, 2, etc. ..	Branches of the Foreign Orders Department.
C.A.F.	Controller of Aircraft Finance.
C.A.S.	Controller of Aeronautical Supplies.
C.C.F.	Controller of Commercial Finance.
C.D.F.	Controller of Departmental Finance.
C.E.	Controlled Establishment.
C.E.1, 2, etc. ..	Branches of the Contracts Department (1917–18).
C.E.D.	Controlled Establishments Division.
C.F.A.C.	Controller of Factory Audit and Costs.
C.G.1, 2, etc. ..	Branches of the Contracts Department (1917–18).
C.G.A.M.	Controller of Gun Ammunition Manufacture.
C.G.M.	Controller of Gun Manufacture.
C.G.S.1, 2, etc. ..	Branches of the Contracts Department (1917–18).
C.I.S.A.	Chief Inspector of Small Arms.
C.I.S.P.	Controller of Iron and Steel Production.
C.I.W.	Chief Inspector, Woolwich.
C.L.F.	Controller of Labour Finance.
C.M.1, 2, etc. ..	Branches of the Small Arms and Small Arms Ammunition Department.
C.M.C.	Controller of Munitions Contracts.
C.M.T.S.	Controller of Munitions Timber Supplies.
C.M.W.	Optical Munitions and Railway Transport Branch.
C.N.F.M.S.	Controller of Non-Ferrous Materials Supply.
C.S.A.M.G.	Controller of Small Arms and Machine Guns.
C.S.D.	Central Stores Department.
C.S.M.	Controller of Shell Manufacture.
C.S.O.F.	Chief Superintendent of Ordnance Factories.
C.W.D.	Chemical Warfare Department.

C.X.F.	Controller of Explosives Finance and Contracts.
D.	Design Group of the Munitions Council.
D.A.O.[1]	Department of Area Organisation.
D.A.P.	Department of Aircraft Production.
D.D.G.	Deputy Director-General.
D.D.G. (A)	Deputy Director-General in charge of Gun Ammunition, etc.
D.D.G. (B)	Deputy Director General in charge of Foreign Orders, Priority, etc.
D.D.G. (C)	Deputy Director-General in charge of Gun Ammunition Filling, etc.
D.D.G. (D)	Deputy Director-General in charge of Ordnance Supplies.
D.D.G. (E)	Deputy Director-General in charge of Small Arms and Ammunition.
D.D.G. (M)	Deputy Director-General of Materials Department.
D.D.G. (T)	Deputy Director-General of the Machine Tool Department.
D.E.S.	Department of Explosives Supply.
D.F.1, 2, etc. ..	Branches of the Finance Department.
D.F.C.	Director of Factory Construction.
D.G.A.T.	Director-General of the American and Transport Department.
D.G.M.D.	Director-General of Munitions Design.
D.G.M.F.	Director-General of Munitions Finance.
D.G.M.S.	Director-General of Munitions Supply.
D.G.M.T.	Director-General of Mechanical Transport.
D.G.S.M.	Director-General of Shell Manufacture.
D.I.M.	Department of Inspection of Munitions.
D.I.S.P.	Director of Iron and Steel Production.
D.M.1, 2, etc. ..	Branches of the Ordnance Supply Department.
D.M.A.	Director of Munitions Accounts.
D.M.C.	Director of Munitions Contracts.
D.M.F.	Director of Munitions Finance.
D.M.I.T.	Director of Munitions Inland Transport.
D.M.O.T.	Director of Munitions Overseas Transport.
D.M.R.S.	Department of Munitions Requirements and Statistics.
D.M.T.	Director of Mechanical Transport.
D.M.W.S.	Department of Mechanical Warfare Supplies.
D.O.1, 2, etc. ..	Branches of Design Department.
D.S.1, 2, etc. ..	Branches of Design Department.
D.S.I.A.	Department of Special Investigation of Accounts.
D.S.O.	Departmental Staff Organisation. (Munitions Supply Department).
E.M.1, 2, etc. ..	Branches of the Small Arms and Machine Guns Department.
E.S.D.	Explosives Supply Department.
F.	Finance Group of the Munitions Council.

D. sometimes stands for Director as well as Department.

G.A.F.	Gun Ammunition Filling Department.
I.M.B.	Imperial Munitions Board, Canada.
L.	Labour Group of the Munitions Council.
L.E.C.	Labour Enlistment Complaints.
M.E.	Military Establishment.
M.F.1, 2, etc. ..	Branches of the Finance Department.
M.I.D.	Munitions Inventions Department.
M.I.T.	Munitions Inland Transport.
M.M.O.P.	Munitions Mineral Oil Production Department.
M.O.T.	Munitions Overseas Transport Department.
M.R.D.	Mineral Resources Development Department.
M.T.D.	Machine Tool Department.
M.W.B.	Munitions Works Board.
M.W.D.	Mechanical Warfare Department.
N.P.L.	National Physical Laboratory.
O.	Ordnance Group of the Munitions Council.
O.F.	Ordnance Factories (Woolwich).
O.M.G.	Optical Munitions and Glassware Department.
P. and G.	Parliamentary and General Department.
P.C.1, 2, etc. ..	Branches of the Contracts Department (1917–18).
P.M.1, 2, etc. ..	Branches of the Contracts Department (1915–17).
P.M.S.	Parliamentary Military Secretary.
R.A.E.	Royal Aircraft Establishment, Farnborough.
R.D.	Research Department (Woolwich).
R.G.P.F.	Royal Gunpowder Factory, Waltham Abbey.
R.I.M.B.	Representative of the Imperial Munitions Board.
R.L.	Royal Laboratory.
R.M.B.	Railway Materials Branch.
R.O.F.	Royal Ordnance Factories.
R.S.A.F.	Royal Small Arms Factory, Enfield.
S.	Steel Group of the Munitions Council.
S.A.M.G.	Small Arms and Machine Guns Department.
S. of E.	Superintendent of Experiment.
S. of R.	Superintendent of Research.
S.W.E.	Superintendent of Waltham and Enfield.
T.M.1, 2, etc. ..	Branches of the Machine Tool Department.
T.W.D.	Trench Warfare Department.
T.W.R.D.	Trench Warfare Research Department.
T.W.S.D.	Trench Warfare Supply Department.
X.	Explosives Group of the Munitions Council.
X.F.C.1, 2, etc. ..	Branches of the Explosives Finance and Contracts Department.
W.	Warfare Group of the Munitions Council.
W.M.V.	War Munition Volunteers.

APPENDIX X.

(Chapter VI, p. 181.)

Organisation of the Munitions Council.

General Memorandum No. 21, Issued 18 August, 1917.

1. In order that large questions of policy affecting all Departments may come before the Minister with the advice of a limited number of officers representing the whole Ministry and that questions affecting single Departments or groups of Departments may be speedily decided by the Minister or those to whom his authority may be delegated in accordance with his general policy, the following administrative changes have been approved.

2. A Council will be established, to be called the "Munitions Council." It will consist of the Minister as President, of the two Parliamentary Secretaries as Vice-Presidents, and of Members each representing a group of the Departments of the Ministry, together with the Secretary. A list of the members showing the constitution of the groups as at present arranged is attached.

3. The members sitting in Council will be representative of the Departments of the Ministry as a whole. The Council will consider such matters as may be referred to it by the Minister and any matters which may, with the Minister's approval, be brought before the Council by any member of the Council.

4. The position of a member of the Council in relation to his group of Departments will be:—

(i) To superintend generally the work of the group and to consider in the first instance all important questions upon which the Head of the Department requires assistance or rulings, such as those which would previously have been submitted to the Minister or through the Parliamentary Secretaries, and either to decide on the Minister's behalf such questions, or to refer them to the Minister with a recommendation as to the decision.

(ii) To exercise such administrative functions through the heads of Departments in his group as are necessary to ensure that the policy of the Minister is carried out.

5. Under rules approved by the Minister, important questions involving more than one group of Departments will be considered at Committee meetings and conferences which the members of the Council representing the groups concerned will attend. Failing agreement between the members of the Council, the question will be referred officially to the Minister for decision.

6. Heads of Departments will continue to be responsible for the efficient administration of their Departments, and the necessary executive action will be taken by them, but all important questions, particularly matters which may affect general policy or other Departments or which from their magnitude or novelty require financial sanction, will be referred by them to the member of the Council to which their group is attached. No change in the organisation of a Department or in important members of the staff will be made without similar reference.

7. The member or members of the Council concerned will generally be present at conferences held by the Minister with heads of Departments, or with Associations, Public Bodies, etc.

8. The Secretary of the Ministry will be responsible for the general administration of the Council Secretariat.

9. A Council Secretariat will be established, consisting of an Assistant Secretary and Secretarial Officers, for each of the groups of Departments, with a sufficient Office and Registry Staff.

10. The foregoing will come into effect from the 20 August.

GROUPS OF DEPARTMENTS UNDER MEMBERS OF COUNCIL.

F. *Finance.*—Sir HERBERT HAMBLING.
- Finance.
- Munitions Works Board.
- Controlled Establishments Finance.
- Munitions Contracts.
- Lands.
- Central Stores.
- Salvage.

D. *Design.*—Major-General the Hon. F. R. BINGHAM, C.B.
- Design.
- Inspection.
- Trench Warfare Design.
- Munitions Inventions.

S. *Steel and Iron.*—JOHN HUNTER, Esq.
- Iron and Steel Production.
- Factory Construction.

M. *Materials, etc.*—Sir ERNEST MOIR, Bart.
- Non-Ferrous Metals.
- Scrap Metals.
- Development of Mineral Resources.
- Government Rolling Mills.
- Transport—Railways
- ,, —Overseas.
- ,, —Trench Warfare.
- Forwarding and Receiving.
- Railway Materials.
- Cranes.
- Optical Munitions.
- Potash.

X. *Explosives.*—Sir KEITH PRICE.
Explosives Supply.
Trench Warfare Chemical Supplies.
Mineral Oil Production.
Royal Gunpowder Factory, Waltham Abbey.

P. *Projectiles, etc.* Sir JAMES STEVENSON, Bart.
Area Organisation.
Gun Ammunition.
Gun Ammunition Filling.
Trench Warfare Ammunition, filling and supply other than Trench guns and howitzers.
Small Arms Ammunition.
Munitions Gauges.
Central Clearing Bureau.
Timber.

G. *Guns.*—Sir GLYNN WEST.
Guns and Carriages (Supply and Repair).
Trench Guns and Howitzers.
Machine Guns, Revolvers, Pistols, etc.
Rifles, Bayonets, etc.
Royal Small Arms Factory, Enfield Lock.
Royal Ordnance Factories, Woolwich.

E. *Engines.*—Sir ARTHUR DUCKHAM, K.C.B.
Aeronautical Supplies.
Petrol Engines Supply.
Mechanical Transport.
Mechanical Warfare.
Agricultural Machinery.
Electric Power Supply.
Machine Tools.
Stampings and Castings.

A. *Allies.*—Sir FREDERICK BLACK, K.C.B.
(Temporarily, Sir CHARLES ELLIS, K.C.B.)

L. *Labour.*—Sir STEPHENSON KENT, K.C.B.
Labour Regulations.
Labour Supply.
Housing.
Welfare.

S. *Secretariat.*
Council Secretariat.
Parliamentary and General.
Legal.
Requirements and Statistics.
Establishment.
Special Intelligence.
Priority.

APPENDIX XI.

(CHAPTER VII, p. 187.)

Defence of the Realm Consolidation Act, 1914.

5 Geo. 5. Ch. 8.

An Act to consolidate and amend the Defence of the Realm Acts.

[27 November, 1914.]

Be it enacted by the King's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :—

1. (1) His Majesty in Council has power during the continuance of the present war to issue regulations for securing the public safety and the defence of the realm, and as to the powers and duties for that purpose of the Admiralty and Army Council and of the members of His Majesty's forces and other persons acting in his behalf ; and may by such regulations authorise the trial by courts-martial, or in the case of minor offences by courts of summary jurisdiction, and punishment of persons committing offences against the regulations and in particular against any of the provisions of such regulations designed—

(*a*) to prevent persons communicating with the enemy or obtaining information for that purpose or any purpose calculated to jeopardise the success of the operations of any of His Majesty's forces or the forces of his allies or to assist the enemy ; or

(*b*) to secure the safety of His Majesty's forces and ships and the safety of any means of communication and of railways, ports, and harbours ; or

(*c*) to prevent the spread of false reports or reports likely to cause disaffection to His Majesty or to interfere with the success of His Majesty's forces by land or sea or to prejudice His Majesty's relations with foreign powers ; or

(*d*) to secure the navigation of vessels in accordance with directions given by or under the authority of the Admiralty ; or

(*e*) otherwise to prevent assistance being given to the enemy or the successful prosecution of the war being endangered.

(2) Any such regulations may provide for the suspension of any restrictions on the acquisition or user of land, or the exercise of the power of making bye-laws, or any other power under the Defence Acts, 1842 to 1875, or the Military Lands Acts, 1891 to 1903, and any such regulations or any orders made thereunder affecting the pilotage of

vessels may supersede any enactment, order, charter, bye-law, regulation or provision as to pilotage.

(3) It shall be lawful for the Admiralty or Army Council—

(*a*) to require that there shall be placed at their disposal the whole or any part of the output of any factory or workshop in which arms, ammunition, or warlike stores or equipment, or any articles required for the production thereof, are manufactured ;

(*b*) to take possession of and use for the purpose of His Majesty's naval or military service any such factory or workshop or any plant thereof ;

and regulations under this Act may be made accordingly.

(4) For the purpose of the trial of a person for an offence under the regulations by court-martial and the punishment thereof, the person may be proceeded against and dealt with as if he were a person subject to military law and had on active service committed an offence under section five of the Army Act :

Provided that where it is proved that the offence is committed with the intention of assisting the enemy a person convicted of such an offence by a court-martial shall be liable to suffer death.

(5) For the purpose of the trial of a person for an offence under the regulations by a court of summary jurisdiction and the punishment thereof, the offence shall be deemed to have been committed either at the place in which the same actually was committed or in any place in which the offender may be, and the maximum penalty which may be inflicted shall be imprisonment with or without hard labour for a term of six months or a fine of one hundred pounds, or both such imprisonment and fine ; section seventeen of the Summary Jurisdiction Act, 1879, shall not apply to charges of offences against the regulations, but any person aggrieved by a conviction of a court of summary jurisdiction may appeal in England to a court of quarter sessions, and in Scotland under and in terms of the Summary Jurisdiction (Scotland) Acts, and in Ireland in manner provided by the Summary Jurisdiction (Ireland) Acts.

(6) The regulations may authorise a court-martial or court of summary jurisdiction, in addition to any other punishment, to order the forfeiture of any goods in respect of which an offence against the regulations has been committed.

2. (1) This Act may be cited as the Defence of the Realm Consolidation Act, 1914.

(2) The Defence of the Realm Act, 1914, and the Defence of the Realm (No. 2) Act, 1914, are hereby repealed, but nothing in this repeal shall affect any Orders in Council made thereunder, and all such Orders in Council shall, until altered or revoked by an Order in Council under this Act, continue in force and have effect as if made under this Act.

APPENDIX XII.

(CHAPTER VII, p. 187.)

Defence of the Realm (Amendment) (No. 2) Act, 1915.

5 Geo. 5. Ch. 37.

An Act to amend the Defence of the Realm Consolidation Act, 1914.
[16 March, 1915.]

Be it enacted by the King's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :—

1. (1) Subsection (3) of section one of the Defence of the Realm Consolidation Act, 1914 (which gives power to take possession and use for the purpose of His Majesty's naval and military services certain factories or workshops or the plant thereof), shall apply to any factory or workshop of whatever sort, or the plant thereof ; and that subsection shall be read as if the following paragraphs were added after paragraph (*b*) :—

" (*c*) to require any work in any factory or workshop to be done in accordance with the directions of the Admiralty or Army Council, given with the object of making the factory or workshop, or the plant or labour therein, as useful as possible for the production of war material ; and

" (*d*) to regulate or restrict the carrying on of work in any factory or workshop, or remove the plant therefrom, with a view to increasing the production of war material in other factories or workshops ; and

" (*e*) to take possession of any unoccupied premises for the purpose of housing workmen employed in the production, storage, or transport of war material."

(2) It is hereby declared that where the fulfilment by any person of any contract is interfered with by the necessity on the part of himself or any other person of complying with any requirement, regulation, or restriction of the Admiralty or the Army Council under the Defence of the Realm Consolidation Act, 1914, or this Act, or any regulations made thereunder, that necessity is a good defence to any action or proceedings taken against that person in respect of the non-fulfilment of the contract so far as it is due to that interference.

(3) In this section the expression " war material " includes arms, ammunition, warlike stores and equipment, and everything required for or in connection with the production thereof.

2. This Act may be cited as the Defence of the Realm (Amendment) (No. 2) Act, 1915.

APPENDIX XIII.

(CHAPTER VII, p. 231.)

Defence of the Realm (Amendment) (No. 3) Act, 1915.

5 & 6 Geo. 5. Ch. 42.

An Act to extend the Defence of the Realm Consolidation Act, 1914.

[19 May, 1915.]

Be it enacted by the King's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :—

1. (1) Where it appears to His Majesty that it is expedient for the purpose of the successful prosecution of the present war that the sale and supply of intoxicating liquor in any area should be controlled by the State, on the ground that war material is being made or loaded or unloaded or dealt with in transit in the area or that men belonging to His Majesty's naval or military forces are assembled in the area, His Majesty has power, by Order in Council, to define the area and to apply to the area the regulations issued in pursuance of this Act under the Defence of the Realm Consolidation Act, 1914, and the regulations so applied shall, subject to any provisions of the Order or any amending Order, take effect in that area during the continuance of the present war and such period not exceeding twelve months thereafter as may be declared by Order in Council to be necessary in view of conditions connected with the termination of the present war.

(2) His Majesty in Council has power to issue regulations under the Defence of the Realm Consolidation Act, 1914, to take effect in any area to which they are applied under this Act—

(*a*) for giving the prescribed Government authority, to the exclusion of any other person, the power of selling or supplying, or controlling the sale or supply of, intoxicating liquor in the area, subject to any exceptions contained in the regulations ; and

(*b*) for giving the prescribed Government authority power to acquire, compulsorily or by agreement, and either for the period during which the regulations take effect, or permanently, any licensed or other premises or business in the area, or any interest therein, so far as it appears necessary or expedient to do so for the purpose of giving proper effect to the control of the liquor supply in the area ; and

(*c*) for enabling the prescribed Government authority, without any licence, to establish and maintain refreshment rooms for the supply of refreshments (including, if thought fit,

the supply of intoxicating liquor) to the general public or to any particular class of persons or to persons employed in any particular industry in the area ; and

(*d*) for making any modification or adjustment of the relations between persons interested in licensed premises in the area which appears necessary or expedient in consequence of the regulations ; and

(*e*) generally, for giving effect to the transfer of the control of the liquor traffic in the area to the prescribed Government authority, and for modifying, so far as it appears necessary or expedient, the provisions of the Acts relating to licensing or the sale of intoxicating liquor in their application to the area.

(3) Any regulations made before the passing of this Act under the powers conferred by any Act dealing with the Defence of the Realm as respects the restriction of the sale of intoxicating liquor are hereby declared to have been duly made in accordance with those powers.

2. This Act may be cited as the Defence of the Realm (Amendment) (No. 3) Act, 1915.

APPENDIX XIV.

(CHAPTER VII, p. 189.)

Ministry of Munitions Act, 1915.

5 & 6 Geo. 5. Ch. 51.

An Act for establishing, in connection with the present War, a Ministry of Munitions of War, and for the purposes incidental thereto.
[9 June 1915.]

Be it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :—

1. (1) For the purpose of supplying munitions for the present war, it shall be lawful for His Majesty to appoint a Minister of Munitions who shall hold office during His Majesty's pleasure.

(2) The Minister of Munitions may appoint such secretaries, officers, and servants as the Minister may determine.

2. (1) The Minister of Munitions shall have such administrative powers and duties in relation to the supply of munitions for the present war as may be conferred on him by His Majesty in Council, and His Majesty may also, if he considers it expedient that, in connection with the supply of munitions, any powers or duties of a Government Department or authority whether conferred by statute or otherwise, should be transferred to, or exercised or performed concurrently by, the Minister of Munitions, by Order in Council make the necessary provision for the purpose, and any Order made in pursuance of this section may include any supplemental provisions which appear necessary for the purpose of giving full effect to the Order.

(2) Any Order in Council made under this section may be varied or revoked by a subsequent Order in Council.

3. (1) There shall be paid out of money provided by Parliament to the Minister of Munitions an annual salary not exceeding five thousand pounds, and to the secretaries, officers, and servants of the Ministry such salaries or remuneration as the Treasury may from time to time determine.

(2) The expenses of the Ministry of Munitions to such amount as may be sanctioned by the Treasury shall be paid out of money provided by Parliament.

4. (1) The Minister of Munitions may adopt an official seal and describe himself generally by the style and title of the Minister of Munitions, and the seal of the Minister shall be officially and judicially

noticed and shall be authenticated by the signature of the Minister or of a secretary or some person authorised by the Minister to act in that behalf.

(2) Every document purporting to be an Order or other instrument issued by the Minister of Munitions and to be sealed with the seal of the Minister authenticated in manner provided by this section or to be signed by the secretary or any person authorised as aforesaid shall be received in evidence and be deemed to be such Order or instrument without further proof, unless the contrary is shown.

(3) A certificate signed by the Minister of Munitions that any Order or other instrument purporting to be made or issued by him is so made or issued shall be conclusive evidence of the fact so certified.

(4) Where in connection with the undertaking of any duties or powers by the Minister of Munitions it appears to the Minister of Munitions and the department or authority concerned that in any notice, order, contract, or other document the name of the Minister of Munitions should be substituted for the name of any department or authority, or that the name of any officer of the Ministry of Munitions should be substituted for the name of any officer of any such department or authority, the Minister of Munitions may order that the substitution shall take effect, subject to any limitations contained in the order, and, where such an order is made, the notice, order, contract, or document shall have effect in accordance with the order.

5. (1) The office of Minister of Munitions or of Secretary in the Ministry of Munitions shall not render the holder thereof incapable of being elected to or sitting or voting as a member of the Commons House of Parliament, but not more than two such Secretaries shall sit as members of that House at the same time.

(2) The Minister of Munitions shall take the oath of allegiance and official oath and shall be deemed to be included in the First Part of the Schedule to the Promissory Oaths Act, 1868.

6. The office of Minister of Munitions and the Ministry of Munitions shall cease to exist on the termination of a period of twelve months after the conclusion of the present war or such earlier date as may be fixed by His Majesty in Council, and then any appointments made under the powers conferred by this Act shall be determined, and any powers or duties which have been transferred to the Minister of Munitions under this Act shall, without prejudice to any action taken in pursuance of those powers or duties, revert to the Department or Authority from which they were transferred.

7. (1) In this Act the expression "munitions of war" and the expression "munitions" mean anything required to be provided for war purposes, and include arms, ammunition, warlike stores or material and anything required for equipment or transport purposes or for or in connection with the production of munitions.

(2) This Act may be cited as the Ministry of Munitions Act, 1915.

APPENDIX XV.

(CHAPTER VII, p. 191.)

The Ministry of Munitions Order, 1915.

At the Court at Buckingham Palace, the 16th day of June, 1915.

Present : The King's Most Excellent Majesty in Council.

Whereas under the Ministry of Munitions Act, 1915, it is lawful for His Majesty to appoint a Minister of Munitions, and the Minister of Munitions is to have such administrative powers and duties in relation to the supply of munitions for the present war as may be conferred on him by His Majesty in Council, and His Majesty may also, if he considers it expedient that, in connection with the supply of munitions, any powers or duties of a Government Department or Authority, whether conferred by statute or otherwise, should be transferred to, or exercised or performed concurrently by, the Minister of Munitions, by Order in Council make the necessary provision for the purpose, and any Order made in pursuance of these powers may include any supplemental provisions which appear necessary for the purpose of giving full effect to the Order :

Now, therefore, His Majesty is pleased, by and with the advice of His Privy Council to order, and it is hereby ordered, as follows :—

1. It shall be the duty of the Minister of Munitions to examine into and organise the sources of supply and the labour available for the supply of any kind of munitions of war, the supply of which is in whole or in part undertaken by him, and by that means, as far as possible, to ensure such supply of munitions for the present war as may be required by the Army Council or the Admiralty or may otherwise be found necessary.

2. There shall be transferred to the Minister of Munitions as from a date to be agreed upon in each case between the Minister of Munitions and the Department or Authority concerned—

(*a*) From the Army Council the functions of the Department of the Master-General of the Ordnance in relation to

contracts, the supply of explosives, and the inspection of munitions subject, however, in each case to any exceptions and limitations which may be agreed upon between the Army Council and the Minister ;

(*b*) Such functions—

(i) In relation to work carried on at the Woolwich Arsenal, the Enfield Small Arms Factory, and the Waltham Powder Factory, as may be agreed upon between the Minister of Munitions and the Army Council ; and

(ii) In relation to work carried on at any other Government establishment used for the purpose of the manufacture or supply of munitions of war, as may be agreed upon between the Minister of Munitions and the Department or Authority having the control of that establishment ;

(*c*) Any other work of the Secretary of State for War, or the Army Council, or of the Admiralty, or any other Government Department or Authority, the transfer of which appears expedient to the Minister of Munitions and to the Department or Authority concerned.

3. For the purpose of giving the Minister of Munitions concurrent powers under the enactments and regulations mentioned in the Schedule to this Order, and in connection therewith, those enactments and regulations shall be read as if, in addition to the Government Department or Authority specified therein, the Minister of Munitions were also specified.

4. The Minister of Munitions shall, in addition to any special powers given to him by this Order, have power, for the purpose of his duties under this Order, to make such contracts and institute such inquiries on behalf of His Majesty and do all such other things as he may consider necessary or expedient for the effective performance of his duties.

5. This Order may be cited as the Ministry of Munitions Order, 1915.

Almeric FitzRoy.

Schedule.

ENACTMENTS AND REGULATIONS UNDER WHICH MINISTER OF MUNITIONS IS TO HAVE CONCURRENT POWERS.

Description of Enactment or Regulation.	Subject-matter of Enactment or Regulation.	Present Authority.
Section 1 (1) and section 1 (3) of the Defence of the Realm Consolidation Act, 1914, as amended by the Defence of the Realm (Amendment) No. 2, Act, 1915.	Power to make regulations as to defence of the Realm.	Admiralty and Army Council.
Section 1 (2) of the Defence of the Realm (Amendment), No. 2, Act, 1915.	Interference with contracts.	Admiralty and Army Council.
The Defence of the Realm (Consolidation) Regulations, 1914 (28 November)—		
Regulation 7 (as amended by the Amending Order in Council of 23 March, 1915).	Power to requisition output of factories manufacturing arms, ammunition, etc.	Admiralty and Army Council.
Regulation 8 (as substituted by Amending Order in Council of 23 March, 1915).	Power to take possession of factories manufacturing arms, ammunition, etc.	Admiralty and Army Council.
Regulation 8A (as added by the Amending Order in Council of the 23 March, 1915).	Power to regulate work at factories with a view to the manufacture of arms, ammunition, etc.	Admiralty and Army Council.
Regulation 10 ..	Power to close licensed premises.	Competent naval or military authority.
Regulation 56 (so far as respects offences under any regulations under which the Minister of Munitions has concurrent powers).	Trial of offences ..	Competent naval or military authority.
Regulation 1 of the Order in Council amending the Defence of the Realm (Consolidation) Regulations, 1914 (23 March, 1915).	Power to take unoccupied premises for the housing of workmen.	Admiralty and Army Council.

APPENDIX XVI.

(CHAPTER VII, p. 193.)

Defence of the Realm (Acquisition of Land) Act, 1916.

6 & 7 Geo. 5. Ch. 63.

ARRANGEMENT OF SECTIONS.

An Act to make provision with respect to the possession and acquisition of land occupied or used for the Defence of the Realm in connection with the present war and for other purposes connected therewith.

[22 December, 1916.]

Be it enacted by the King's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and

Commons, in this present Parliament assembled, and by the authority of the same, as follows :—

1. (1) Where, during the course or within the week immediately preceding the commencement of the present war, possession has been taken of any land by or on behalf of any Government department for purposes connected with the present war, whether in exercise or purported exercise of any prerogative right of His Majesty, or of any powers conferred by or under any enactment relating to the defence of the realm, or by agreement, or otherwise, it shall be lawful, subject to the provisions of this Act, for the Government department in possession (hereinafter referred to as the occupying department), after the termination of the present war, to continue in possession of the land for such period, not exceeding two years from such termination, as the occupying department may consider necessary or expedient, and, if on application being made to the Railway and Canal Commission (hereinafter referred to as the Commission) not less than six months before the expiration of such two years the Commission consent thereto, for such further period, not exceeding three years from the expiration of such two years, as the Commission may consider necessary or expedient in the national interest.

(2) Whilst any land so continues in the possession of any occupying department, the department may for the purposes of the public service exercise in relation thereto all such powers as were during the continuance of the war exercisable in relation thereto for the purposes of the defence of the realm, subject, however, as respects the power to close public highways, to the provisions of sub-section (3) of Section 6, and as respects the power of removal of buildings and works, to the provisions of Section 2 :

Provided that—

(*a*) If the exercise of any such powers causes the pollution, abstraction, or diversion of water or the emission of noxious fumes to such an extent that if exercise of such powers had not been authorised by this Act persons interested in adjoining or neighbouring land would have been entitled to restrain the exercise thereof, any person who would have been so entitled shall be entitled to such compensation in respect of any loss occasioned by such pollution, abstraction, diversion, or emission during the period of occupation under this section as, failing agreement, may be determined in manner provided by this Act ; and

(*b*) Nothing in this section shall be construed as depriving any person of any right to recover damages in respect of any injury to property caused by accident due to the exercise of any such powers as aforesaid.

(3) The occupying department shall pay such rent in respect of any land which continues in their possession, and such continuance

shall be upon and subject to such terms and conditions, as to compensation or otherwise (including compensation for any depreciation attributable to works and buildings not removed), as, failing agreement, shall be determined in manner provided by this Act, and in determining the rent payable under this provision regard shall be had to the like considerations as are set out in para. 6 of the Schedule to this Act with respect to the determination of compensation payable for land acquired under this Act.

(4) The occupying department may transfer possession of any land to the Admiralty or Army Council or the Minister of Munitions, and upon such a transfer being made the department to whom possession is transferred shall be deemed to be the occupying department.

2. (1) Whilst any land of which possession has been so taken is in the possession of an occupying department after the termination of the present war, any building or other work which for purposes connected with the present war has been erected or constructed on, over, or under the land wholly or partly at the expense of the State, or, with the consent of the occupying department, at the expense of some person not being a person interested in the land, may be removed, without the consent of any person interested in the land by the occupying department, or, with the consent of the occupying department, by the person at whose expense it was erected or constructed, any law or custom to the contrary notwithstanding :

Provided that—

(*a*) Where the building or work was erected or constructed partly at the expense of a person interested in the land ; or

(*b*) Where in pursuance of an agreement with a Government department any person interested in the land is entitled to the benefit of or to prohibit the removal of the building or work ;

this provision shall not authorise the removal of that building or work during the continuance of such interest in the land without the consent of that person or the persons deriving title under him :

Provided also that where under any agreement a Government department is entitled to remove any such building or work nothing in this section shall prejudice the rights of the department or any other person under the agreement.

(2) Where any building or work has been removed under the powers conferred by this section the occupying department shall cause the land to be restored to the condition in which it was before the building or work was erected or constructed, or shall, if the persons interested in the land agree or the Commission consent, instead of so restoring the land, pay such compensation in respect of the depreciation (if any) in the value of the land attributable to the disturbance of the soil as in default of agreement may be determined in manner provided by this Act.

(3) Where any such buildings or works have been erected or constructed upon any common, open space, or allotment the building or work shall be removed and the land restored as aforesaid, except in such cases and to such extent as the Board of Agriculture and Fisheries on the application of the occupying department may by order declare that such removal and restoration is not required in the interests of the persons interested in the land or the public :

Provided that before any such order is made the Board of Agriculture and Fisheries shall give the local authority or board of conservators (if any) in which is vested the management of the common, open space, or allotment, and any other local authority interested, an opportunity of being heard, and that before any such order comes into effect a draft thereof shall be laid before each House of Parliament for a period of thirty days on which that House has sat, and if either of those Houses before the expiration of that period presents an address to His Majesty against the draft or any part thereof, no further proceedings shall be taken thereon, without prejudice to the making of a new draft order.

(4) Where any building or any machinery or plant fixed or attached to any land has, for purposes connected with the present war, been erected wholly or partly at the expense of the State in accordance with an agreement with any person interested in the land, any power to remove the building, machinery and plant so erected conferred on any Government department under the agreement may be exercised, notwithstanding any rights in the building, machinery, or plant to which any other person interested in the land, whether as mortgagee or otherwise, may be entitled.

3. (1) Subject to the provisions of this Act it shall be lawful to acquire by agreement or compulsorily on behalf of His Majesty—

(*a*) Any land in the possession of an occupying department or any interest in such land ;

(*b*) Any land on, over, or under which any buildings, works, or improvements have, for purposes connected with the present war, been erected, constructed or made wholly or partly at the expense of the State, or any interest in such land ;

(2) Where any land or any interest in land is or has been so acquired any adjoining or neighbouring land (whether belonging to the same owner or not), or any right of access, or other easement or right which appears to the Commission to be required for the proper enjoyment of the land or interest so acquired, or any interest therein, may, with the consent of the Commission, also be acquired.

(3) The power to acquire land, or an interest therein, under this section shall include power to acquire the land or interest either with or without all or any of the mines or minerals lying thereunder as the purchasing department may determine, and if the surface is acquired apart from the mines and minerals either without any right of support or with such right of support as the department may require.

(4) The power of acquisition conferred by this section shall be exercisable—

(*a*) In the case of land in the possession of any occupying department or of land and rights required for the proper enjoyment thereof, by the occupying department at any time whilst the department is in possession, but not later than three years after the termination of the present war ;

(*b*) In the case of other land or rights, by the Admiralty or Army Council or the Minister of Munitions at any time during the present war or within twelve months after the termination thereof.

(5) For the purposes of the acquisition of land and interests therein under this section, the provisions of the Lands Clauses Acts, subject to the modifications set out in the Schedule to this Act, shall be incorporated with this Act.

(6) Where any buildings, works, or improvements have, for purposes connected with the present war, been erected, constructed, or made wholly or partly at the expense of the State, on, over, or under any land, no person shall without the consent of a Government department remove, destroy, alter, or dispose of the buildings, works, or improvements whilst the right of acquiring the land conferred by this section remains in force.

(7) Any person having power (whether subject to any consent or conditions or not) to sell land authorised to be acquired by any Government department may, subject to the like consent and conditions, grant or demise the land in perpetuity or for any term of years to the Government department at such fee farm or other rent, secured by such condition of re-entry or otherwise as may be agreed upon, and with or without a right of renewal, or grant to the Government department an option to acquire the land :

Provided that, where the power to sell arises under the Settled Lands Acts, 1882 to 1890, the powers conferred by this section shall be exercised only with the consent of the trustees of the settlement for the purposes of those Acts, or with the sanction of the court.

4. Any land which, or an interest in which, has been acquired under this Act may be used by any Government department for the purpose for which it was used during the war or for any other purpose for which it could have been used had the land been acquired under the Defence Acts, 1842 to 1873, or the Military Lands Acts, 1892 to 1903, notwithstanding that such user could, but for this Act, have been restrained as being in contravention of any covenant or for any other reason, and no person interested in any adjoining or neighbouring land or entitled to any riparian rights shall be entitled to restrain such user ; but if, apart from this Act, any such person would have been entitled to restrain such user, then, if application for the purpose is made within three years after the date of the acquisition of the land

under this Act or after the commencement of the user causing the depreciation, whichever may be the later, he shall—

(i) If the land is used for a purpose for which it could have been used had the land been acquired under the Defence Acts, 1842 to 1873, or the Military Lands Acts, 1892 to 1903, be entitled to such compensation in respect of any breach of a restrictive covenant or damage caused by the pollution, abstraction, or diversion of water, or by the emission of noxious fumes, as in default of agreement may be determined in manner provided by this Act ; and

(ii) If the land is used for any other purpose, be entitled to such compensation in respect of any damage occasioned by such user as in default of agreement may be determined in manner provided by this Act :

Provided that—

(*a*) Where such compensation is claimed in respect of any land, the department may, at any time before such claim is determined, and on payment of all costs properly incurred by the claimant in respect of his claim, require the claimant to sell the land or his interest therein at such price as would have been proper if the value of the land had not been so depreciated, such price in default of agreement to be determined in like manner as if the land had been acquired under Section **3** of this Act ; and

(*b*) Nothing in this section shall be construed as depriving any person of any right to recover damages in respect of any injury to property caused by accident due to such user as aforesaid ; and

(*c*) In the user of land or an interest in land acquired under this Act the provisions of the Alkali, etc., Works Regulation Act, 1906, and the Rivers Pollution Prevention Acts, 1876 and 1893, and of any local Act dealing with the like matters, shall be complied with, and those Acts shall apply accordingly, and nothing in this section shall affect the powers conferred by any Act, whether public, general or local, on any local authority, board of conservancy, or other public authority, with respect to the prevention of the pollution of rivers, or the abatement of nuisances caused by the emission of smoke or other noxious fumes.

5. (1) Where any land or any interest therein has by virtue of this Act been acquired by any Government department, the department may at any time thereafter sell, lease, or otherwise dispose of the land or interest.

(2) Where any such land is disposed of, then on the execution and delivery to the purchaser by the Government department concerned of

the necessary or proper assurance of the land disposed of, the purchaser shall notwithstanding any defect to the title of such Government department thereto stand possessed thereof for such estate or interest as may be expressed or intended to be assured to him, freed and absolutely discharged (save as in the assurance may be expressed) from all prior estates, interests, rights, and claims therein or thereto :

Provided that if at any time after such disposition any such prior estate, interest, right, or claim as aforesaid is established by the person entitled thereto, there shall be paid to such person compensation to be determined in manner provided by the Lands Clauses Acts, as modified by this Act, with respect to interests in lands which by mistake have been omitted to be purchased.

(3) Before any Government department sell any land so acquired or interest therein they shall, unless such land is land upon which buildings of a permanent nature have been erected wholly or partly at the expense of the State or at the request of, or by arrangement with, any Government department, or is land used in connection with such buildings, first offer to sell the same to the person then entitled to the lands (if any) from which the same were originally severed ; or if such person refuse to purchase the same, or cannot after diligent enquiry be found, then the like offer shall be made to the person or to the several persons whose lands shall immediately adjoin the lands so proposed to be sold.

(4) If any such persons be desirous of purchasing such lands, then within six weeks after such offer they shall signify their desire in that behalf to the Government department concerned, or if they decline such offer, or if for six weeks they neglect to signify their desire to purchase such lands, the right of pre-emption of every such person so declining or neglecting in respect of the lands included in such offer shall cease.

(5) If any person entitled to such pre-emption be desirous of purchasing any such lands and such person and the Government department concerned do not agree as to the price thereof, or other consideration therefor, then such price or other consideration shall be determined in manner provided by this Act.

(6) The provisions of the last three foregoing subsections shall apply in the case of a lease of land for a term exceeding twenty-one years in like manner as they apply to a sale of land, except where the land is leased for the purpose of the development thereof in connection with any factory, building, camp, or other premises erected or established on land retained by the Government.

6. (1) Where, in the exercise or purported exercise of any prerogative right of His Majesty or any powers conferred by or under any enactment relating to the defence of the realm, or by agreement, or otherwise, for purposes connected with the present war, any railway or tramway or any cable line or pipes have been laid along, across, over, or under any public highway, it shall be lawful after the termination of the war for the railway or tramway or the cable line or pipes to continue to be used and maintained along, across, over, or under the

highway, subject to such conditions as the Board of Trade, in the case of railways and tramways, and in other cases as the Commission after giving the local authority and the authority or person responsible for the maintenance of the highway or of any other railway or tramway laid thereon an opportunity of being heard, may by order prescribe, and any such authority or person may apply to the Board or Commission to make such an order :

Provided that where any such railway or tramway crosses the roadway on the level it shall not be lawful to use the crossing after the expiration of two years from the termination of the present war without the consent of the local authority.

(2) In the event of the use of any such railway or tramway being discontinued, the Government department by whom it was laid down or used shall take up and remove the rails and restore the highway on which they are laid to the satisfaction of the authority or person responsible for the maintenance of such highway.

(3) Where in exercise of any such right or powers as aforesaid any public highway has been closed, it may be kept closed after the termination of the present war, but not, by virtue of this section, beyond the expiration of twelve months after such termination unless the consent of the Commission is obtained, and the Commission before giving such consent shall give to the local authority and the authority or person responsible for the maintenance of the highway an opportunity of being heard, and the Commission may require as a condition of their consent the provision of another highway in the place of the highway so closed, and any person interested in any land adjoining any highway so closed who suffers loss or damage in consequence of the closing thereof shall be entitled to such compensation as, in default of agreement, may be determined in manner provided by this Act to be the amount of such loss or damage.

(4) For the purposes of this section the expression " local authority " means, in the case of a borough or urban district, the council of the borough or urban district, and elsewhere the county council.

(5) Where any such railway, tramway, cable line, or pipes have been laid along, across, over, or under any public highway, or a public highway has been closed, in pursuance of an agreement with, or subject to any undertaking given to, the authority or person responsible for the maintenance of the highway, nothing in this section shall authorise the continuance of the user of the railway, tramway, cable line, or pipes, or the continuance of the closing of the highway beyond the time specified in the agreement or undertaking without the consent of the authority or person so responsible.

7. Where any company or authority authorised to supply water, light, heat, or power, has, on the requisition or at the request of any Government department for purposes connected with the present war, supplied water, light, heat, or power to any factory, building, camp, or other premises and such supply is not authorised by law, whether by reason of the premises not being within the area of supply of the

company or authority or otherwise, or is in contravention of any agreement made by the company or authority, the company or authority after the termination of the war, shall, if and so long as required by any Government department to do so, continue the supply, but not beyond the expiration of twelve months after such termination unless the consent of the Commission is obtained, and before giving such consent the Commission shall give to the company or authority in whose area of supply the premises are situated, and any other person who appears to them to be interested in the continuance or discontinuance of such supply, an opportunity of being heard, and, if the premises are not within the area of supply of the company or authority, the company or authority shall have the like power with respect to the supply of water, light, heat, or power to the premises as if the premises were within its area of supply, and as if any roads or bridges along, across, over, on or under which any pipes or lines or other works have been laid for the purpose of supplying the premises were roads which the company or authority were authorised to break up for the purpose of their undertaking: Provided that no supply of water, light, heat, or power shall be given or shall continue to be given under this section by any company or authority if and so long as such supply would prejudice the supply within the area of supply of such company or authority.

8. (1) All questions as to compensation or as to the purchase price of land or any interest therein to be paid under this Act shall—

(*a*) If both parties agree within such time as may be allowed by the Commission, be determined by a single arbitrator agreed by the parties;

(*b*) If either party so requires within such time as may be allowed by the Commission, be referred to such one of a panel of referees to be appointed in like manner as the panel appointed under Part I of the Finance (1909–10) Act, 1910, as may be selected by the Reference Committee as defined by Section 33 of that Act, whose decision shall, subject to an appeal to the Commission on any question of law, be final;

(*c*) In any other case, be determined by the Commission.

(2) The provisions of the Railway and Canal Traffic Act, 1888, as amended by any subsequent enactment, relating to the procedure for the determination of questions by the Commission under that Act, including the provisions relating to appeals, shall apply to the determination of questions, including appeals from referees, referred to the Commission under this Act, as if they were herein re-enacted and in terms made applicable to this Act:

Provided that—

(*a*) The Commission may in any case in which they think it expedient to do so call in the aid of one or more assessors specially qualified, and hear the case wholly or partially with the assistance of such assessors;

(*b*) The Commission may hold a local enquiry for the purposes of this Act by any one of their members, or by any officer of the Commission or other person whom they may direct to hold the same, and the said provisions of the Railway and Canal Traffic Act, 1888, except the provisions relating to appeals, shall, so far as applicable, apply to such enquiries, and any officer or person directed to hold an enquiry shall have power to administer an oath and shall report the result of the enquiry to the Commission ;

(*c*) The Commission may act by two of their members, one of whom shall be the judge ;

(*d*) The discretion of the Commission with respect to costs shall be subject to the provisions of the Lands Clauses Acts as modified by this Act as to costs, in cases where those Acts as so modified apply, but shall not be limited in the manner provided by Section 2 of the Railway and Canal Traffic Act, 1894.

9. Until Parliament otherwise determines, all compensation and purchase money payable by a Government department under this Act, and all other expenses incurred by any Government department thereunder, shall be defrayed out of money provided by Parliament.

10. For the purposes of this Act a certificate by any Government department—

(*a*) That possession has been taken of any land for purposes connected with the present war ; or

(*b*) That the department is in possession of such land or is the occupying department within the meaning of this Act ; or

(*c*) That any sums therein specified have been expended by the State in erecting, constructing, or making buildings, works, or improvements for purposes connected with the present war on, over, or under any land ; or

(*d*) That any such buildings, works, or improvements have been erected, constructed, or made with the consent of the occupying department at the expense of a person not being a person interested in the land ; or

(*e*) That a railway or tramway has been laid along, across, over, or under a public highway, or that a public highway has been closed, in the exercise of any prerogative right of His Majesty, or any powers conferred by or under any enactment relating to the defence of the realm for purposes connected with the present war ; or

(*f*) That water, light, heat, or power has been supplied to any premises on the requisition or at the request of a Government department for purposes connected with the present war ;

shall be *prima facie* evidence of the facts therein stated.

11. (1) Any street, building, or work which has been formed, erected, or constructed otherwise than in accordance with the provisions of any general or local Acts relating to streets or buildings, and with any bye-laws or regulations made thereunder on any land to which Section 1 of this Act applies, or which has been acquired under Section 3 thereof, shall, unless the authority by whom such provisions, bye-laws, or regulations are enforced consent to the continuance thereof, either be so altered as to comply with such provisions, bye-laws, or regulations, or be discontinued or removed within such reasonable time, not being less than two years, after such land or building has ceased to be occupied by a Government department as such authority may order, and the owner (as defined by such Acts, bye-laws, or regulations) shall have power to enter upon and carry out any works without the consent of any other person, and if he fails to comply with such order such authority as aforesaid may remove any such building or work and recover the expense incurred in such removal from the owner in a summary manner as a civil debt.

(2) If any person feels aggrieved by the neglect or refusal of such authority to give its consent, or by the conditions on which such consent is given, or as to the time within which such discontinuance or removal is ordered, he may appeal to the Local Government Board, whose decision shall be final and shall have effect as if it were a decision of the authority: Provided that the Board may before considering any such appeal require the appellant to deposit such sum not exceeding ten pounds to cover the costs of appeal as may be fixed by rules to be made by them.

12. (1) For the purposes of this Act, and of the provisions of the Lands Clauses Acts incorporated with this Act, land includes any building or part of a building, any pier, jetty, or other structure on the shore or bed of the sea or any river, and any easement or right over or in relation to land.

(2) Where consideration has been given or an advance made by the State for the erection, construction, or making of any building, work, or improvement on, over, or under any land for purposes connected with the present war, or where any money which would otherwise have been payable to the State has with the consent of a Government department been applied towards the erection, construction, or making of any such building, work, or improvement, the building, work, or improvement shall for the purposes of this Act be deemed to have been erected, constructed, or made wholly or partly, as the case may be, at the expense of the State.

(3) For the purposes of this Act, except where the context otherwise requires, the expression "building" includes machinery and plant fixed or attached to the building, the expression "common" shall include any land subject to be enclosed under the Inclosure Acts, 1845 to 1882, and any town or village green, and any other land subject to any right of common; the expression "open space" shall mean any land laid out as a public garden or public park, or used for the

purposes of public recreation ; and the expression " allotment " shall mean any allotment set out for any public purpose under an Inclosure Act or award.

(4) For the purposes of this Act references to the Defence Acts, 1842 to 1873, and the Military Lands Acts, 1892 to 1903, shall include references to those Acts as applied by the Naval Works Act, 1895.

(5) For the purposes of this Act a competent naval or military authority acting under the Acts relating to the Defence of the Realm shall be deemed to be a Government department.

13. (1) Nothing in this Act shall authorise the acquisition of any interest in any common, open space, or allotment, or the acquisition otherwise than by agreement of any land which forms part of any park, garden, or pleasure ground, or of the home farm attached to and usually occupied with the mansion house, or is the site of any ancient monument or other object of archæological interest, or of any interest in such land or grounds :

Provided that—

(*a*) Nothing in this subsection shall prevent the acquisition, whether by agreement or compulsorily, of a right to use and maintain any cables, lines, or pipes which have been laid under any such land as aforesaid ; and

(*b*) Where before the passing of this Act there have been erected on any park, garden, pleasure ground, or farm as above mentioned, any buildings for the manufacture of munitions of war, the Commission may by order authorise the compulsory acquisition of the park, garden, pleasure ground, or farm, or any part thereof, where they are satisfied that it is of national importance that it should be acquired, so, however, that if the owner so requires, the whole of such property, including the mansion house, if any, shall be acquired, and that before the order made by the Commission comes into effect, a draft thereof shall be laid before each House of Parliament for a period of thirty days on which that House has sat, and if either of those Houses before the expiration of that period presents an address to His Majesty against the draft or any part thereof, no further proceedings shall be taken thereon.

(2) Nothing in this Act shall authorise the retention of the possession for more than three months after the termination of the war of—

(*a*) Land belonging to any local authority within the meaning of the Local Government (Emergency Provisions) Act, 1916 ; or

(*b*) Land belonging to any company or corporation carrying on a railway, dock, canal, water, or other public undertaking other than land which, having before the commencement of the present war been used for the purposes

of the undertaking, had before that date ceased to be so used ; or

(*c*) Land held by or on behalf of any governing body constituted for charitable purposes which at the commencement of the war was occupied and used by that body for the purposes of that body ;

without the consent of the appropriate Government department, or, in the case of a university or a college at a university, without the consent of the governing body of the university or college, provided that such consent, if given, shall not authorise the retention of possession for a longer period than three years after the termination of the war, and if any question arises as to what department is the appropriate Government department, the question shall be determined by the Treasury, and nothing in this Act shall authorise the acquisition of any such land as aforesaid or of any interest in or right of access or other easement or right over any such land, except by agreement with such authority, company, corporation, or body as aforesaid.

(3) Where possession has been taken of any land under any agreement authorising the retention of the land for any period specified in the agreement, nothing in this Act shall authorise the retention of possession after the expiration of such period without the consent of the person with whom the agreement was made or the persons deriving title under him.

(4) Nothing in this Act shall authorise the compulsory acquisition of land with respect to which an agreement has been made for the restoration thereof to the owner or the person previously in occupation thereof (other than an agreement to give up possession of land at the expiration of a tenancy), or, in the case of land subject to an agreement for sale to a Government department, shall authorise the acquisition of the land otherwise than in accordance with the terms of the agreement.

(5) Nothing in this Act shall authorise the compulsory acquisition of land without the consent of the Commission where the purposes for which it is to be acquired are purposes other than those for which land can be acquired under the Defence Acts, 1842 to 1873, or the Military Lands Acts, 1892 to 1903.

(6) For the purposes of this section the expression " governing body constituted for charitable purposes " includes any person or body of persons who have a right of holding or any power of government of or management over any property appropriated for charitable purposes, and includes any corporation sole, and the governing body of any university, college, school, or other institution for the promotion of literature, science, or art.

14. The powers conferred by this Act shall be in addition to and not in derogation of any other right or power of His Majesty.

15. In the application of this Act to Scotland the following modifications shall be made :—

(*a*) Subsection (7) of Section 3 and subsection (2) of Section 5 shall not apply.

(*b*) " Borough or urban district " means " royal, parliamentary, or police burgh " ; " easement " means " servitude " ; " mortgagee " means " heritable creditor " ; and " restrain " includes " interdict."

(*c*) The Local Government Board for Scotland shall be substituted for the Local Government Board, and the Secretary for Scotland for the Board of Agriculture and Fisheries.

16. In the application of this Act to Ireland the expression " the Lands Clauses Acts " shall not include the Railways Act (Ireland), 1851, the Railways Act (Ireland), 1860, the Railways Act (Ireland), 1864, or the Railways Traverse Act, or any Act amending those Acts ; and the expression " Local Government Board " means the " Local Government Board for Ireland."

17. This Act may be cited as the Defence of the Realm (Acquisition of Land) Act, 1916.

SCHEDULE.

Modification of the Lands Clauses Acts.

1. The department acquiring the land or interest therein shall be deemed to be the promoters of the undertaking, and this Act shall be deemed to be the special Act.

2. The provisions as to the sale of superfluous land and as to access to the special Act shall not apply.

3. All questions of disputed compensation shall be settled by an arbitrator or referee or the Commission, as the case may require (hereinafter referred to as the arbitration tribunal).

4. No allowance shall be made on account of the acquisition being compulsory.

5. Where a portion only of any factory or other building is required the owners and other persons interested in such building may, notwithstanding anything in the Lands Clauses Acts, be required to sell and convey the portions only of the building so required, if the Commission are of opinion that such portions can be severed from the remainder of the properties without material detriment thereto, and in such case compensation shall be paid for the portions required, and for any damage suffered by the owners or other parties interested in the building by severance or otherwise.

6. In determining the amount of compensation, the value of the land acquired shall be taken to be the value which the land would have had at the date of the notice to treat if it had remained in the condition in which it was at the commencement of the present war, without regard to any enhancement or depreciation in the value which may be attributable directly or indirectly to any buildings, works or improvements, erected, constructed, or made on, over or under the land, or any adjoining or neighbouring land for purposes connected with the present war wholly or partly at the expense of the State, or, with the consent of the occupying department, at the expense of any person not being a person interested in the land :

Provided that—

(*a*) Where any such building, work, or improvement was erected, constructed, or made in pursuance of an agreement with any person interested in the land, the consideration given by such person shall be taken into account in assessing the compensation payable in respect of such interest ;

(*b*) Where by virtue of an agreement with any Government department any person interested in the land is entitled as between himself and that department to the benefit of any such building, work, or improvement, the value attributable to such building, work, or improvement shall be taken into account in assessing the compensation payable in respect of such interest ;

(*c*) Where, since the commencement of the present war, any person interested in the land has himself erected, constructed, or made any building, work, or improvement, or has contributed to the expense thereof, or has committed any act depreciating the value of the land, the value attributable to his expenditure or the depreciation in value attributable to such act shall be taken into account in assessing the compensation payable in respect of such interest.

7. In determining the amount of compensation the arbitration tribunal shall also take into account the amount (if any) of any compensation paid or other payment received in respect of the previous occupation of the land so far as such compensation or payment was payable in respect of matters other than the mesne profits of the land.

8. Where the surface of the land is acquired without the mines and minerals lying thereunder, the provisions of Sections 77 to 85 of the Railways Clauses Consolidation Act, 1845, shall apply subject to this modification, that for the purpose of Section 78 of that Act " prescribed " shall mean " prescribed by the arbitration tribunal."

9. Where by reason of the erection, construction, or making of any such buildings, works, or improvements as aforesaid or the maintenance thereof, or by reason of the user of the land, any interest

in the land has become or might become forfeited or liable to forfeiture, the compensation shall be determined as if no such forfeiture or liability to forfeiture had arisen or might arise.

10. The Lord Chancellor may make rules fixing a scale of costs to be applicable on an arbitration under this Act, and the arbitration tribunal may, notwithstanding anything in the Lands Clauses Acts, determine the amount of costs and shall have power to disallow as costs in the arbitration the cost of any witness whom they consider to have been called unnecessarily, and any other costs which they consider to have been caused or incurred unnecessarily, and, if they think the circumstances such as to justify them in so doing, to order that each of the parties shall bear their own costs.

11. There may be contained in the award of the arbitration tribunal a finding that the claimant, after having been requested in writing by the department by whom the land or interest therein is to be acquired so to do, has failed to deliver to such department within a reasonable time a statement in writing of the amount claimed, together with any information in his possession which may be reasonably required to enable such department to make a proper offer, and, where such a finding is contained in the award, the provisions of the Lands Clauses Acts as to costs of arbitrations shall apply if such department had offered the same sum or a greater sum than that found to be due by the award :

Provided that this provision shall not apply unless the written request for information contained a notice of the effect of this provision.

12. The provisions of this Schedule shall apply to Scotland subject to the following modifications :—

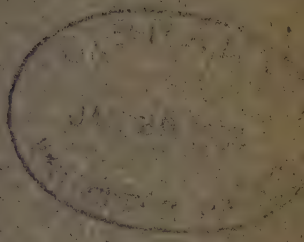
(*a*) For the reference to mesne profits there shall be substituted a reference to profits ;

(*b*) For the reference to Sections 77 to 85 of the Railways Clauses Consolidation Act, 1845, there shall be substituted a reference to Sections 70 to 78 of the Railways Clauses Consolidation (Scotland) Act, 1845, and for the reference to Section 78 of the former Act there shall be substituted a reference to Section 71 of the latter Act ;

(*c*) " The Court of Session " and " Act of Sederunt " shall be substituted for " the Lord Chancellor " and " rules " respectively.

13. The provisions of this Schedule shall apply to Ireland with the substitution of a reference to the Lord Chancellor of Ireland for the reference to the Lord Chancellor.

HISTORY OF THE MINISTRY OF MUNITIONS



VOLUME II

GENERAL ORGANISATION FOR MUNITIONS SUPPLY

PART I—SUPPLEMENT

LIQUIDATION OF THE MINISTRY OF MUNITIONS

1922

VOLUME II

GENERAL ORGANISATION FOR MUNITIONS SUPPLY

PART I—SUPPLEMENT

LIQUIDATION OF THE MINISTRY OF MUNITIONS

CONTENTS.

Liquidation of the Ministry of Munitions.

APPENDIX.

(5792) Wt. 31447/X4022. 250 3/22 Harrow G.36

SUPPLEMENT.

LIQUIDATION OF THE MINISTRY OF MUNITIONS.

I. Post Armistice Problems of Administration.

(*a*) Introductory.

One of the principal lessons of the war was the need for co-ordinated effort in all spheres of activity. During 1918 this question became one of great importance, and seriously affected discussions on the future of the Ministry of Munitions. A large body of opinion was in favour of extending the responsibilities of the Ministry to cover all supply for the naval and military forces, and all problems of demobilisation. Opinion was not however unanimous, and practical difficulties in connexion with the transfer of duties prevented any drastic action during the war. After the Armistice the settlement of this question was shelved in favour of more urgent business. The need for co-ordination in disposal was too obvious to be ignored, and the recognition by the Government of the Ministry of Munitions as the most suitable nucleus for a disposal organisation, was accompanied by the formation of a Disposal Board within the Ministry to deal with all surplus Government property.

The development of the Ministry of Munitions into an organisation for centralised supply, had been approved in principle by the War Cabinet in November, 1918, and the question was under discussion for the next eighteen months, but the reluctance of the Admiralty and Air Ministry to entrust to any other authority responsibility for design, which, as war experience had shown, could not safely be separated from supply, proved an insurmountable difficulty. In view of the enormous stocks of war material, the purely supply problem faded into insignificance, and when the immediate need for co-ordination had passed, the objections of the Departments gained weight. Concessions made to the Admiralty and Air Ministry resulted in a scheme by which the bulk of their supplies would be provided by themselves. Thus the main object of the Ministry of Supply, *i.e.*, to centralise all buying, finance and accounts departments, would be lost, and it was obvious that the resulting conditions would not justify the establishment of a separate organisation to carry out the much curtailed duties which remained.

The matter was not finally settled until the spring of 1920, when considerable progress had been made in the disposal of stocks and the liquidation of contracts. It was then decided that the whole of the supply duties of the Ministry should be handed back to the Departments from which they had been originally transferred, the administration of the remaining material controls having already been transferred to the Board of Trade. By the Ministry of Munitions

and Shipping (Cessation) Act, 1921, the Ministry ceased to exist on 31 March, 1921, when all its remaining powers, duties and property were transferred to the Treasury, and the responsibility for winding up the work of liquidation and disposal was vested in a Disposal and Liquidation Commission appointed by the Treasury.

(*b*) Preparations for Demobilisation.

The problem of demobilisation had been the subject of consideration within the Ministry since the spring of 1917. In April, Dr. Addison had appointed a Reconstruction Department and a Reconstruction Committee to collect information regarding these matters, but on the formation of the Ministry of Reconstruction, demobilisation policy became the province of the new Ministry, and the duties of the Demobilisation and Reconstruction Committee of the Munitions Council appointed by Mr. Churchill on 3 November, 1917, were limited to making plans for the liquidation of contracts and for facilitating the transition to peace production.

Of the various problems of demobilisation, disposal of stocks was the only one calling for executive action before the Armistice. The question of the disposal of surplus Government property had been raised in May, 1917. The most effective plan seemed to be to vest responsibility for the disposal of all stores in one authority, but against this the Treasury urged that executive action should remain with the individual Departments in order to preserve the responsibility of the officers of these Departments for realising to the best advantage receipts from the property in their charge. The difficulty of reconciling the Treasury view with a decision of the Government in June, 1917, that the Stores Department of the Ministry of Munitions should form a nucleus for a single disposal authority, and the difficulties inherent in the actual transfer to one authority of all surplus articles, prevented any effective general arrangement for disposal before the Armistice. A representative Advisory Council on disposal, under Lord Salisbury, and an Executive Board had been created by Order in Council on 4 March, 1918, but their work had been much hindered by the indefinite nature of their powers, and the failure of the various Departments to reach an agreement.

In the meantime, the Surplus Stores Department of the Ministry, which had been established in May, 1918, to deal with the disposal of Ministry surplus stores and to centralise all information relating thereto, was proceeding with the disposal of surplus and obsolete stores in the possession of the Ministry, as far as this could be done pending final arrangements for the collective disposal of surplus Government property.

(*c*) Additional Powers required by the Ministry.

Immediately after the Armistice, a Bill was prepared to enable the Ministry of Munitions to deal with problems of demobilisation and the transfer of industries from the production of munitions to peace production. The existing powers of the Ministry applied only to the supply of munitions of war, and some doubt arose as to whether the

Minister could use his powers for what might be described as the reverse process. It had not been anticipated when these powers were granted, to how great an extent it would be necessary for the Minister to direct industry into strange channels and to foster and create new industries. With respect to certain material, notably building bricks, it was essential that power should be retained to secure that commodities should be directed to peace purposes of a kind which were in the best interests of the country. Otherwise, material would go to those prepared to pay the highest price. An Act was therefore passed on 19 November,[1] extending the purposes of the Ministry to include the supervision and regulation of the diversion to peace production of industries established or utilised during the war for the production of war material, and extending the scope of all powers exercised by the Minister for promoting the prosecution of the war to facilitate the transition to peace production.

Special legislation was necessary to enable the Government to sell such engines and machinery as were patented articles. The Government had power to construct and use such stores by virtue of section 29 of the Patents and Designs Act, 1907, but it was doubtful whether they had a right to sell them or the purchaser to use them. To meet this point and protect both the Government and purchaser a Bill was drafted, but it did not become law until the end of 1919, and meanwhile the Board was bound to proceed with sales. The result was the issue of a writ against the Controller of Huts and Building Materials by Colonel Nissen in connexion with the advertisement and sale of certain huts over which Colonel Nissen held patent rights. His claim was settled by the payment of £10,000. The new Act[2] empowered the Government to sell any article made for the Government in pursuance of its right to use inventions for the service of the Crown, and the clause had a retrospective effect.

The rights and obligations of the Ministry under various agreements were in many cases defined by reference to "the duration of the War." On 21 November, 1918, a Bill was passed empowering His Majesty by Order in Council to declare what date was to be treated as the date of the termination of the war, this date to be as nearly as possible the date of the exchange or deposit of peace ratifications. Thus the date of the termination of war with different enemy countries varied, but that with Germany was fixed as 10 January, 1920.

Some delegation of power from the Treasury was necessary to secure prompt liquidation of the enormous number of contracts outstanding at the time of the Armistice, and, at Mr. Churchill's suggestion, the Treasury agreed that full responsibility should rest with the Minister and therefore delegated full powers of settlement to him, subject to the following general conditions :—

(1) That regard being had to the adjustment of Ministry claims on contractors for loans and advances, the maximum amount payable should not exceed the amount which would have been payable if the contract had been allowed to expire in the ordinary course.

---

[1] Ministry of Munitions Act, 1918. [2] Patents and Designs Act, 1919.

(2) That settlement should in each case be subject to the concurrence of the Minister's financial advisers, responsible to him through the Financial Secretary.

(3) That in case of cancellation otherwise than as provided in the contract terms, the rate of profit allowed in assessment of compensation should not as a rule exceed the rate provided in the usual break clauses.[1]

The necessity for obtaining Treasury consent for the sale of buildings was found to lead to serious delays, and in June, 1919, the Treasury agreed to grant a general authority to the Minister for the sale of real property, provided the official valuation did not in any one case exceed £5,000, and provided the concurrence of the financial adviser to the Board was in each case obtained.[2]

(*d*) Administrative Machinery for Demobilisation.

A Demobilisation Board was organised within the Ministry by Mr. Churchill on 6 November, 1918, to replace the Reconstruction and Demobilisation Committee. The latter body had been advisory only, but the new Board had full administrative authority. The members of the Board were assisted by departmental advisers and financial representatives, and two of them were charged with the disposal of stores and factories, respectively.

Two days after the appointment of this Board, the War Cabinet decided to create a Ministry of Supply, of which the Ministry of Munitions should form the nucleus organisation. Disposal and liquidation were to be functions of the new Ministry, but, pending its formation, arrangements were continued by the Demobilisation Board. Three committees of the Board were appointed; the first to advise the Board as to the demobilisation of the higher staff; the second, a Raw Materials Committee, to advise on matters affecting allocation, price and other forms of control, import and export requirements and arrangements with the Allies. The third committee, the Machine Tools Committee, advised the Board on similar matters connected with machine tools. An Advisory Committee of Employers drawn from the Federation of British Industries was also appointed to advise the Board on problems of demobilisation.

It was suggested that independent organisations should be set up for supply and liquidation, but it seemed impracticable to divide the responsibility, and eventually it was arranged that the Demobilisation Board should be responsible also for supply, the Board forming the nucleus of a reconstructed Munitions Council, which was formed on 7 December. Under the new organisation the surviving functions of supply were merged in the new responsibility for liquidation and disposal. Under the original constitution of the Munitions Council, the supply departments had been regarded largely as self-contained businesses, grouped under Members of Council responsible for their general superintendence. Under the new organisation, the spheres of business

[1] M/Demob./167. [2] Minutes of Disposal Board, 1007.

assigned to Members of Council were functional rather than departmental. Thus there were Members for Finance, Labour, Military Services, Priority, Liquidation and Disposal, and each department referred to the appropriate Member of Council questions relating to his particular function.

A Co-ordinating (Supply and Demobilisation) Committee and a Finance Committee of the Council were appointed, and the three committees of the Demobilisation Board were perpetuated. A permanent sub-committee of the Demobilisation Committee of the War Cabinet was formed at the same time to correlate and review the action taken, or to be taken, by all Government Departments dealing with the liquidation of war contracts, and to review consequent dislocation and the possibilities of absorbing the labour affected.[1]

In consequence of the decision of the Cabinet to entrust the Ministry with the disposal of all surplus stores, the disposal organisation as at first set up under the Demobilisation Board, required some modification. The two essentials were the provision of a strong central organisation to deal with policy, financial authority and co-ordination of executive action, and the decentralisation of the executive work among those sections or departments having already a knowledge of the stores. In order to obviate the creation of a large new department and the duplication of staff, it was proposed that the work of disposal should be undertaken by existing supply departments, each of which should organise special branches for this work.[2]

These plans were still incomplete when the reconstruction of the Government took place in January, 1919, and Lord Inverforth, Surveyor-General of Supply at the War Office, succeeded Mr. Churchill as Minister of Munitions, his supply staff as Surveyor-General accompanying him to the Ministry.[3] The new Minister continued the departmental arrangements for the liquidation of contracts, and existing supply duties, but modified the disposal organisation contemplated by Mr. Churchill, though the guiding principle of a central co-ordinating authority and decentralised executive remained unchanged. The Surplus Government Property Disposal Board, which had been set up in March, 1918, was dissolved,[4] and the Minister on 23 January, 1919, appointed a Surplus Government Property Disposal Board under the chairmanship of the Deputy-Minister, Mr. F. G. Kellaway. The experience of the former Board was secured to the new organisation by the appointment of Sir Howard Frank as deputy-chairman.

Owing to the enormous value of the property to be disposed of, Lord Inverforth regarded it as essential that there should be an outside and independent expert body to advise on broad lines of policy, to whom he could refer questions put to him by the Disposal Board for decision. Accordingly, an Advisory Council consisting of men of wide business experience, under the chairmanship of Lord Salisbury,

---

[1] (Printed) *Weekly Report*, No. 171, I (7.12.18).
[2] M.C., 796.
[3] For the work and organisation of the Department of the Surveyor-General of Supply, *see* Vol. VII, Part I, Supplement.
[4] HIST. REC./R/202/4.

was appointed in February to advise the Minister on policy. Various questions were referred to this Council during the first few months after the appointment of the Board.

The departmental organisation for disposal was entirely separated from supply, for it was evident that a supply controller would not necessarily be qualified to undertake disposal, since, for the latter, a knowledge of the various trades for which stores were usually manufactured would be of more value than a knowledge of the manufacture of the stores themselves.[1] The disposal branch was divided into 17 sections, each under a controller responsible to the Disposal Board. The sections were arranged in groups, each under the general superintendence of a Member of the Board. The grouping of these sections was not the same as that of the supply departments, as the grouping for disposal was determined mainly with reference to the desirability of including in the same section, goods which would naturally find their outlet in the same market, e.g., medical stores, equipment and instruments; or which from their location or nature would be advantageously dealt with together, e.g., dock plant and water craft; or goods which could be most conveniently disposed of at the same time and place, e.g., furniture, buildings and factories.

The principle guiding the selection of controllers and their staffs, was that the executive functions of sale should be controlled by men of commercial experience, possessing full knowledge of the stores with which they had to deal. Each section controller had the assistance of a committee of honorary advisers of special knowledge and experience, with the purpose of keeping the Department closely in touch with the industries concerned. The various committees gave advice as to general principles to be adopted in the disposal of stores, and by this means it was secured that the claims of industry were kept in view.

The disposal of raw materials purchased on trading accounts by the Raw Materials Department was effected independently of the Disposal Board. The Raw Materials Committee of the Demobilisation Board, which had been appointed in November, became an advisory committee of the new Munitions Council in December, and reported directly to the Minister. An effort was made by the Disposal Board to obtain the inclusion within the Board's organisation of the Ferrous, Non-Ferrous and Chemical Sections, but the Minister in April, 1919, decided against this. The Disposal Board was, however, responsible for the disposal of scrap and semi-manufactured articles resulting from purchases of raw materials, the Raw Materials Department acting as their agents therefor.[2] The reason for this arrangement was a Treasury decision that stores forming part of a trading account, having originally been purchased for the purpose of re-sale, could not be regarded as surplus, and were, therefore, not disposable by the Board. It was permissible, however, for the Board to act as a selling agent, transferring the cash proceeds of the sale to the Department responsible for the trading account.[3]

---

[1] HIST REC./R/202/9. [2] Minutes of the Disposal Board, 636.
[3] D.B./6/4.

A special organisation was set up to supervise disposal arrangements in the theatres of war. It was agreed with the War Office that a Disposal Commissioner should be appointed in each theatre of war to act directly under the Board. This officer gave directions to the officer in charge of the military organisation, who was directly under the Commander-in-Chief.

Disposal in France was retarded by the difficulty of distinguishing between the functions of the military and Disposal Board authorities, and by slowness of communications between them. In order to expedite matters, the military disposals staff was, in June, 1919, authorised to communicate direct with the Board's Commissioner, as to sales and prices. Commissioners were authorised to negotiate sales by private treaty up to £5,000. In July, 1919, a Chief Commissioner was appointed for all theatres of war in order to provide more direct supervision.

Early in 1920, the arrangements for disposal in France were considered, and after a visit of the Minister to Paris it was decided that a committee of the Board should take over responsibility for disposals and act as an Executive Board, subject to the supreme control of the London Board.

In February, 1919, Lord Inverforth appointed a committee to advise on the reorganisation of the Ministry of Munitions as a Ministry of Supply. The guiding principle in this proposed reorganisation was that close contact should be maintained with the business world, and that the constitution of the new Department should contain provisions for enabling it to draw on the services of eminent business men in the same way as had been done by the temporary Departments created during the war. The report was duly presented in March.

A Ministry of Supply was, however, never formed, for reasons which will appear later, and in May, 1919, a provisional organisation was adopted to cover the existing functions of the Ministry of Munitions. Departmental groups were formed under the Secretary of the Ministry and the Accountant-General in the charge of seven Directors-General, dealing respectively with Requirements and Statistics, Raw Materials (two departments), Purchases, Factory Administration, Stores and Transport and Inspection, the Disposal Board remaining as already constituted.[1]

(*e*) Transfer of Functions to other Departments.

After the Armistice the functions of the Ministry of Munitions were gradually reduced. In some cases, committees came to a natural end when their work in connexion with the manufacture of munitions ceased; in other cases the duties devolved upon other Departments. Ministry responsibility for labour matters had ceased in November, 1918, when the Labour Department was transferred to the Ministry of Labour. As the result of discussions during February, 1919, between the Ministry and the War Office, it was decided that, as from 10 March, the whole of the staff of the Design Department should be transferred to the War Office as a complete unit; that the whole of the Research

[1] General Memorandum 187 (*see* Appendix).

Department at Woolwich should be similarly transferred, and that inventions, so far as technical military stores were concerned, should come within the province of the War Office. By Order in Council of 11 June, 1920, all the functions of the Ministry so far as they concerned War Office supply were transferred as from 1 June to the War Office. At the same time the War Office again became responsible for the Ordnance Factories, for such national factories as still existed, for pivotal plant retained at Lancaster, Birtley and at the armament firms' works, and for inspection and storage. From this date the Central Stores Department of the Ministry became responsible to the Disposal Board. Arrangements were made during January, 1919, for the Air Ministry to accept responsibility for the supply of aircraft, etc., and for the transfer to that Ministry of the technical, inspection and supply departments of Aircraft Production, but the transfer was held in abeyance during 1919, pending a Cabinet decision as to its desirability, and the transfer did not actually take place until 1 January, 1920.

It was arranged during March, 1919, that the functions of the Optical Munitions Department as regards the development of the glassware, scientific instrument, and potash industries should be transferred to the Board of Trade, but the Ministry retained the work of supply, liquidation and disposal. The transfer took place as from 1 June, 1919.[1] The responsibility for policy in respect of metals and chemicals held by the Ministry was transferred in the spring of 1919 to the Board of Trade, though the actual commercial handling of these materials was continued by the Ministry. Mica control was transferred to the Board in May, 1919. The Board of Trade also became responsible for the electrical power policy of the Government, and it was arranged in April that the functions of the Electric Power Supply Department of the Ministry as regards new electric power schemes should be transferred to the Board, the Ministry department being disbanded as soon as current schemes were completed.

As previously stated, the existence of the Ministry of Munitions was terminated on 31 March, 1921. By Order in Council of 24 March, and Treasury Minute of 1 April, all its remaining powers, duties and property were then transferred to the Treasury, and a Commission with Lord Inverforth as chairman, was appointed by the Treasury to deal with the remaining business of disposal and liquidation.[2] A reorganised Disposal Board and a Liquidation Board were set up under the Commission.[3]

(*f*) Proposals for a Ministry of Supply.

The question of a central Ministry of Supply, embracing purchasing operations for all Government Departments, had been raised many months before the Armistice. The root principles on which the case for such a Ministry rests are that Departments charged with special technical functions, such as those involved in the military or naval

[1] Sec./Gen./1272.

[2] On the resignation of Lord Inverforth in May, 1921, Sir Howard Frank became Chairman of the Disposal and Liquidation Commission.

[3] General Memorandum 349.

defence of the Empire, ought not to have their energies distracted by purely business problems of supply and production. Buying is an expert operation, and the extent and importance of government purchases justify the setting up of an expert establishment to deal with them. The concentration in a single Ministry of the whole responsibility for dealing with problems of supply in relation to the entire Government Service must not only produce a far superior equipment in experience and technique than could be acquired individually by the various Departments in dealing with their own sectional aspects of the subject, but must also lead to a saving of expenditure by avoiding interdepartmental competition and obviating the duplication and overlapping of staffs and the maintenance of scattered, and, in the aggregate, unnecessarily large stocks, and to increased efficiency, by enabling the provision of government requirements to be looked at as a single problem and to be directed by a co-ordinated and uniform policy.

These principles hold good with regard to centralised supply, either as a war time or a peace time organisation, but at the time when the question first arose, emphasis was strongest on the value of central supply as a means of facilitating co-ordination of war effort, and thus effecting economy in man power, materials and technical skill. It was this aspect which led Mr. Churchill to suggest in February, 1918, the amalgamation of the Labour Departments of the Admiralty and Ministry of Munitions in the Ministry of National Service, and the simultaneous transfer of the Controller's department of the Admiralty to the Ministry of Munitions. By this means, a large part of the government purchasing operations would be concentrated in one Department, and to complete the process of centralisation, Mr. Churchill advocated the subsequent transfer of the remaining production departments of the War Office to the Ministry of Munitions. He also suggested that the Works Departments of the War Office, Air Ministry and Ministry of Munitions should be massed together under the Chief Commissioner of Works. Thus would be secured a single policy for war labour and a single policy for war supplies, and it would be possible to obtain a general view of the whole resources of the country. A closer control of material resources and productive capacity would enable the War Cabinet's decisions on policy to be translated into action more rapidly. Demands from the Services could be considered concurrently, and a single programme of supply drawn up under a Cabinet ruling. Thus the existing elaborate system of priority could be dispensed with, as all questions of allocation would be governed by the co-ordinated programme, and any changes required to meet a new strategical policy could be readily accomplished.

A committee, under the chairmanship of Lord Inchcape, appointed by the Treasury in February, 1918, to consider the best means of controlling contract prices and limiting profits, approaching the subject from a different point of view, arrived at the same conclusion as Mr. Churchill as to the advisability of a central purchasing Department. The principal reason urged by this committee for setting up a Ministry of Supply was the simplification of administration which would become possible, leading to a saving of staff and more efficient production.

The existing arrangements, by which some 15 Government Departments purchased stores independently, led to a multiplication of all common service departments—finance, costings, contracts, storage, transport and so forth. A grouping of these departments would save not only the purely clerical and minor administrative staff, but what was of far greater importance, the higher class officers, business men and chartered accountants. Great economy would also be effected in skilled engineers, chemists, etc., for under war conditions it was not unusual to find a comparatively small factory with a number of resident engineers supervising contracts placed by various Government Departments, while in addition it was constantly visited by inspectors, auditors and labour officers acting on behalf of different Departments. Negotiations with contractors would be greatly simplified if work were undertaken for one Department by the reduction of the multiplicity of returns and investigations.

Lord Inchcape's Committee outlined a Ministry of Supply formed by the expansion of the Ministry of Munitions to include in its sphere all government purchases except food and such highly technical supplies for the Navy as could not be entrusted by the Admiralty to any independent authority. The views of the War Office and Air Board as represented by witnesses before the committee were unanimously in favour of centralised supply, but the Admiralty were unwilling to devolve their responsibility for any war material to another Department. The committee, however, believed that non-technical stores for the Admiralty could well be supplied by a common purchasing Department.

A recognition of the difficulty of finding the superman capable of administering the proposed organisation prevented the committee from pressing their recommendation with any great conviction, and, as an alternative remedy for the defects of the existing arrangements, they recommended the appointment of a standing committee consisting of heads of the contracts departments of the Admiralty, War Office, Air Ministry and Ministry of Munitions with an independent chairman, to agree upon the general lines of policy to be adopted by all Departments in dealing with contractors, as to control of profits, forms of contract, charges for material, costings investigations, reduction of sub-contracting and over-lapping purchase. A similar committee consisting of the heads of the four stores departments under the same chairmanship should be set up to consider government stores generally, with a view to reducing the number of patterns, investigating overlapping stocks of similar stores, and improving stores returns and statistics.

Lord Haldane's Committee on the Machinery of Government dealing with the question from the standpoint of economical administration, reported in the same sense as Lord Inchcape's Committee. Without detailing the scope of the new Ministry, the committee suggested that it should at any rate retain the whole of the supply functions of the Ministry of Munitions. While recognising that the allocation of functions between the Departments in relation to design, manufacture and inspection was a question calling for expert examination, the committee thought that the success with which the Ministry had dealt

with supplies for the War Office, and with aeronautical supplies, showed that the technical difficulties were not incapable of solution. They emphasised the point that the success of the new Ministry depended largely upon the degree of approximation that could be attained to the theory of complete concentration.

The Cabinet's decision on 8 November, 1918, to form a Ministry of Supply had hardly been taken when the signing of the Armistice altered the circumstances and brought to the fore all the difficulties connected with the fulfilment of the project. The urgency of the need for allocating industrial resources to the best advantage passed away, and the problem of the future organisation of the different Departments became pressing. The post Armistice problems of the Air Ministry were of exceptional urgency, and the technical department was the key to their solution. Accordingly, at the end of 1918, the Minister for Air proposed that for immediate purposes, the Controller of the Technical Department should be considered unofficially as under the control of the Air Ministry. His contention was that the country could not afford to lose the impetus to aeronautical progress, which had been acquired during the war. The manufacturing industry must have an immediate lead from the Air Ministry in the general development of aircraft for commercial purposes, especially in the matter of modifying war type machines to make them suitable for passenger, mail and goods traffic.

Mr. Churchill at once recognised how seriously this proposal would prejudice the future of the Ministry of Supply, and refused sanction to any proceeding which could lead to the separation of the Technical Department from the Ministry of Munitions at that stage. The Air Council, however, pressed their point with some urgency, and as, from the experience of the war it was generally recognised that in the case of a highly technical and non-standardised supply like aircraft, the user, designer, and producer must be in the closest possible relationship, the demand for the transfer of the technical department was soon followed by the proposition that the supply and inspection departments should be also transferred to the Air Ministry. The Air Council were, however, willing to allow the Ministry of Supply to provide non-technical stores, and even aircraft and engines after they had emerged from the development stage. The fact that control of commercial aviation was in the hands of the Air Ministry and that commercial machines were still to be evolved, while even military aeronautics could not yet be considered to have reached a permanent basis gave much force to the contention of the Air Council, and greatly impressed some of the most enthusiastic supporters of a Ministry of Supply.

It thus came about that the supporters of a Ministry of Supply in the Cabinet were ranged in two parties, one adhering to the original conception of complete concentration, and the other advocating an organisation of more limited scope, *i.e.*, one which should embrace the supply of standard stores only. The latter proposal involved the existence of sections within the Service Departments for the provision of all equipment of a technical nature and in effect cut at the root of the whole case for a Ministry of Supply, by eliminating the principal

argument in its favour, *i.e.*, economy in administration. The success with which the Ministry of Munitions had dealt with aircraft supply during the war was cited as proving the possibility that a Ministry of Supply could deal with even the most technical and experimental stores, but against this it was contended that it was because the Department of Aircraft Production had been only nominally a department of the Ministry of Munitions, that supply had been so successful.

Throughout the early months of 1919 negotiations continued between the Ministry of Munitions and the three principal supply Departments with a view to settling to what extent the Ministry could undertake supply. The arrangements for the transfer of the purchasing departments of the War Office to the new Ministry were comparatively simple, for Lord Inverforth had administered these departments as Surveyor-General of Supply. The only difficulty arose on the question of control over design, experiment and inspection in such classes of military supply as ordnance and tanks. At first it was provisionally agreed that with regard to all war stores the responsibility for patterns and design which would include invention, research, experimental work, design and technical inspection, should rest with the War Office, and that the responsibility for supply and production, including related financial and contractual business, should belong to the new Ministry of Supply, the War Office to retain charge of base depots, and to remain responsible for the storage, maintenance and control of reserves of war stores and war equipment required by the Army. Subsequently it was provisionally and temporarily agreed that inspection should remain with the Ministry, but that design should, at the discretion of the Army Council, have a small supervising staff to ensure that the standard of inspection as laid down by the Army was faithfully adhered to.

Negotiations with the Air Ministry proceeded on the principle of transferring the technical and inspection departments to the Air Ministry, and also the supply department, except that part of it which dealt with materials.

Negotiations with the Admiralty reached a deadlock when the Ministry of Munitions interpreted the Cabinet decision of 8 November to mean that all supply should be handed over to them, with the exception only of ships and such technical and experimental stores as the Admiralty could make out a case for exempting from the rule. The Admiralty, on the other hand, proposed to retain responsibility for supply of ships and their essential equipment, and to transfer only the supply of articles of a general stock nature, such as machine guns and small arms ammunition.

When these negotiations became known to the Chancellor of the Exchequer, who in the interests of economy was a keen advocate of the Ministry of Supply in the completest possible form, he asked that the point should be reconsidered or submitted to the Cabinet, as he believed it would not be easy to justify to Parliament a Ministry of Supply whose scope was restricted to standardised articles.

The point was referred in March to the War Cabinet, but other preoccupations delayed its consideration until the end of the year.

The proposed settlement with the Air Ministry thus remained in abeyance, and the effect was serious, as the staff working in the Department of Aircraft Production was being broken up, and the Director-General of Supply and Research in the Air Ministry had no department under him in which to enrol staff, pending the decision of the Cabinet. It was arranged provisionally in April, 1919, that Major-General Ellington, Director-General of Supply and Research, and a member of the Air Council, should act as Director-General of Aircraft Production in succession to Sir Arthur Duckham, and this provisional arrangement continued throughout 1919.

Meanwhile, a Bill for a Ministry of Supply was drafted in general terms, without defining its powers. The chief provisions of the Bill were that a Minister of Supply should be appointed for the purpose of—

(1) The provision of land, buildings, supplies, materials, stores and animals, and the execution of works (including works of construction) for the public service.

(2) The disposal of lands, buildings, supplies, materials, stores and animals which had become or might from time to time become surplus to the requirements of the Public Service.

The Bill left the new Ministry largely at the mercy of the Departments, in that no powers could be transferred to it without their concurrence, and the Committee of Home Affairs reported in May, 1919, that unless the Ministry of Supply was provided with more effective powers than were given in the draft Bill, there would be little chance of passing the latter through the Commons.

The whole question was reviewed by the Cabinet on 9 December, 1919. On the broad question whether a separate Ministry of Supply was required there had been a considerable change of opinion since the Armistice. For the next five years it appeared that the Services would be living on their surplus stores, and the number of purchases to be made would be too small to justify a separate purchasing agency. The antagonism of the Admiralty to the proposal was known, and the desire of the Air Ministry to control the technical department was recognised as legitimate, and was generally admitted to involve the control of supply also. On the other hand, in case of a future war, the need for eliminating competition between the supply departments of the various Services would be as great as ever, and the argument in favour of a central pool for stocks still held good. If, however, a Ministry of Supply were established and other Departments simultaneously maintained their supply staffs, conditions would be worse than ever, and the proposal for a Ministry of Supply could only be countenanced in the assumption that other supply departments should disappear.

Much of the difficulty during the war had arisen because the personnel of the Service Departments were unacquainted with trade conditions, and were unaware, for instance, how economy could be secured by a slight change in pattern. This being so, it appeared that an alternative remedy might be found in an overhauling of the staffs of the technical, designing and producing departments of the Services, and organising them on such a basis as to make it possible to expand

them into a Ministry of Supply should another war break out. It was generally agreed that for the purchase of ordinary trade articles, such as boots, clothing and consumable stores, there would be great advantage in central buying, and the Service Departments were asked to draw up lists of stock commodities and standardised articles which might with advantage be the subject of common purchase and manufacture.

The Services, when submitting the required lists of stores, stipulated for inspection by their own officers in a large number of cases, though none of the lists included war stores of any kind, and reserved to themselves responsibility for the maintenance of adequate stocks and reserves, and control of such stocks. Since each Department would have to maintain contracts branches, each submitted a similar scheme for co-ordinating purchase, without setting up a central purchasing department, by the institution of an inter-departmental committee under an independent chairman.

The suggested functions of the committee were to co-ordinate the demands of the several Departments as the interests of economy might require, to ensure that full advantage should be taken of all opportunities to purchase in bulk, and to suggest modifications in pattern in order to secure the greatest possible measure of standardisation of articles in common use. This scheme was put forward as likely to provide a useful framework on which, with the addition of the supply branches of the Services, a Ministry of Supply could, without dislocation, be built up, in case of another war of the first magnitude.

Lord Inverforth pointed out that this suggestion entirely ignored the dearly bought experience of the war with regard to the practical limitations of departmental expansion and the limited extent to which co-operation was possible. It also overlooked the fact which had formed his principal reason for pressing the formation of the new Ministry—namely, that buying was at least as expert a profession as fighting. A drastic reorganisation of the administration of the supply Services could not be satisfactorily or economically effected under the pressure of a national emergency, and if the benefits of centralisation were to be secured in time of war it was essential that the proper machinery should be already established as a permanent feature of the national organisation and should have acquired the necessary experience of functioning under normal conditions. It was also to be observed that the alternative proposals of the Admiralty and War Office dealt only with the requirements of the fighting Services, whereas the need for co-ordinating civil requirements was equally imperative.

The discussion was not renewed until March, 1920, when the Cabinet again considered the matter. The main argument of the Service Departments was that during time of peace the existence of a Ministry of Supply was unnecessary, though they admitted that such a Ministry would be essential during a great war, to prevent competition between Departments for material and labour. The Cabinet decided on 23 March that the advantages likely to be derived from the establishment of a Ministry of Supply were not sufficient to outweigh the immense parliamentary difficulties which would be encountered in passing a Bill for the creation

of a new Ministry ; but, in order to secure economy and eliminate the forcing up of prices by competition, the three Service Departments should set up a joint committee to regulate and co-ordinate their purchases and supply. No further formal discussion by the Cabinet took place, and with the disappearance of the Ministry of Munitions at the end of March, 1921, the question of a Ministry of Supply in time of peace ceased to have practical importance. As regards a time of war, the Cabinet decision of 8 November, 1918, still stands, and it will be for the Government later to determine under what conditions effect is to be given to the policy of that decision.

II. Liquidation of Contracts.

(*a*) Scope of the Work.

The problem before the Ministry at the time of the Armistice in connexion with the liquidation of contracts was a twofold one. In the first place, the contracts which were no longer required had to be cancelled or otherwise determined, with a minimum disturbance of industry and labour, and, in the second place, the accounts of contractors and Allies had to be liquidated in respect of the war period. Production was, in the case of most stores, reaching its maximum when hostilities ceased, and processes of liquidation were rendered more difficult by arrears of work which had accumulated, owing to war pressure, in the accounting departments both of the Ministry and of contractors. Thus liquidation involved a much larger number of transactions than those arising out of contracts actually current at the Armistice, and the settlement of the terms on which such contracts should be liquidated was in most cases only the preliminary to a general review of accounts with contractors.

The contracts outstanding at the Armistice numbered 34,682 and their value was estimated at about £355,000,000. Of these, 3,722, of an estimated value of about £17,000,000 were in respect of supplies still definitely required, leaving 30,960 for immediate liquidation.[1]

After settlements had been concluded between the liquidator and contractor, shewing the agreed claims of the latter under the liquidation, there still remained the final settlement of accounts. The involved relations between contractors and the Ministry, due to purchase and sale by the Ministry of certain material and components, made the settlement of accounts a very complicated matter. At the Armistice there were in the hands of the Accounts Department 80,740 contractors' bills, and from that date to March, 1920, 634,911 further claims were received.[2] The agreement of a contractor's account involved not only the determination of the correctness of his bills, but also the recovery of any sums due from him for material, the accounting for material issued to him without charge, the adjustment of subsidies, the recovery of loans in respect of capital expenditure, the agreement of inventories of material remaining on hand, the settlement of disputes in regard to defective material, and in a large number of cases, the fixing of prices in respect of supplies to and by the contractor by means of cost investigations.

[1] Cmd. Paper 1055 of 1920. [2] *Ibid.*

(*b*) General Policy.

The general policy to be adopted in the liquidation of contracts had been the subject of consideration for many months before the Armistice. The Committee on Demobilisation and Reconstruction appointed in November, 1917, had devoted much attention to this subject. It was realised that the problem of unemployment would have an important bearing on the subject, and two alternative policies were discussed. The first contemplated the manufacture of munitions on a reduced scale during the transition period in order to mitigate unemployment, the second, the discontinuance of the production of useless munitions at the earliest possible moment, whatever the immediate effect might be upon the labour market. It was foreseen that the limitation of storage accommodation would of itself necessitate a rapid diminution of output of munitions and the need for economising material and hastening the transition to peace industry would make it undesirable that the output of useless munitions should be continued a day longer than was absolutely necessary. The second policy, therefore, appeared the more practicable and was recommended by the Committee, who were acquainted with the fact that unemployment allowances were to be made to civilian war workers after demobilisation. Plans were therefore laid on the assumption that the duty of the Ministry would be to ensure the most rapid turnover to peace time production, and to conserve raw materials for the most essential industrial purposes, with a due, but not preponderating, consideration for the effects upon labour, and the agreement of the Ministry of Reconstruction was obtained.

A number of Ministry contracts were terminable under war break clauses by which the Minister was entitled to terminate any contract at the end of the war. The period of notice allowed was usually from 14 days to four weeks, but it was longer in the case of supplies whose productive period was longer, and the Minister had power to direct the contractor either to cease manufacture entirely or to complete and deliver all articles actually in course of manufacture, the Minister taking over all unused material, components and semi-manufactured goods. These clauses were applied to all contracts extending over three months or more, and were drawn with a view to defining and limiting the amount of the contractors' claims when it was decided to stop supplies at the end of the war. The contracts terminable under a war break clause constituted only about 30 per cent. of the total placed by the Ministry, but financially they covered the greater part of the Ministry's contractual obligations.[1] Though from the point of view of financial economy it would have been desirable to put the war break clauses into operation as soon as possible, there was no doubt that such a course generally adopted might, by involving a general cessation of work, have produced industrial chaos at a moment when steadying factors were of the greatest importance, and the policy of immediate cessation of war work could not be adopted.[2] Arrangements for labour demobilisation were not complete at the time of the Armistice, and between 11 November and Christmas, 1918, the labour situation was so difficult that the Minister of Labour

[1] Hist Rec./R/264.2/3. [2] Hist. Rec./R/670/5.

requested the liquidation officers of the Ministry of Munitions to avoid any action which might result in violent dislocation of labour before the unemployment donation scheme was in full operation.[1] Further, the Demobilisation Board was instructed by the Minister to act on the assumption that there might be a renewal of hostilities, and that the means of production must not be dispersed until it was certain that the Armistice would be carried out.[2]

These circumstances prevented the prompt stoppage of munitions output, and preliminary instructions were issued to contractors, pending negotiations for cancellation of contracts, to the effect that there should, as far as possible, be no immediate general discharge of munition workers.

It was arranged that the Ministry should not for the time being exercise the war break clause, but contracts were in general terminated at once under the ordinary break clauses without prejudice to the Ministry's right to insist on the war break clause at a later date.

In order to prevent waste of material, however, on unnecessary munitions, supplies to firms were immediately stopped at the Armistice except for stores definitely required, and firms were instructed to put in process no new material. This led to claims for compensation due to loss of profit, but, in the case of explosives, small arms ammunition and small arms contracts, resulted in a great saving of chemicals and metal which were needed for post war industry. Since in many contracts the war break clause was the only mode of cancellation, it was soon found that the prohibition on putting these clauses into operation was having a paralysing effect on liquidation, and early in December the Minister ruled that in the case of contracts running for eight weeks or more, contractors might be notified that the break clause would be enforced at the end of that period, with a due regard to the labour situation.[3]

(*c*) Liquidation Procedure.

For purposes of liquidation, contracts were divided into three classes, aircraft, explosives, and other countracts. In accordance with a Treasury ruling, liquidation was associated closely with finance throughout, liquidators acting in agreement with the principles and procedure approved by the Finance Department. Actual negotiations for liquidation were in general carried out by the individuals who had hitherto conducted most of the business with contractors. Sir Gilbert Garnsey, the Chief Liquidator of general contracts, appointed controllers to deal with certain classes of stores corresponding to and in certain cases identical with the supply controllers of the Ministry. Sir Arthur Duckham, to whom had been entrusted the liquidation of aircraft contracts, appointed a committee to deal with the business in detail. The liquidation of mechanical transport contracts was also carried out by this committee since the same class of contractor was dealt with

[1] Hist. Rec./R/520/11.
[2] Minutes of Demobilisation Board, 12 November, 1918.
[3] Minutes of Demobilisation Board, 8 December, 1918.

in the two cases. The Munitions Works Board was appointed liquidator in connexion with assisted contracts and factory construction work, and all contracts placed with Boards of Management were liquidated through the Department of Area Organisation.

The volume of work involved in a complete audit of all assisted contracts, for the purpose of certifying Ministry liabilities, would have been so great that the Minister obtained Treasury sanction for a curtailment, where it had been shown by a partial examination that the claims were reasonably accurate. The commitments of the Ministry were in general settled by negotiation, the general policy being to give such contributions as would conduce to the ultimate completion of the work of extension. The sanction of the Treasury was still sought in cases where large sums were involved, but in other cases a general authority was granted to the Ministry to fix the amount of the contribution within a maximum sum, subject to a specific degree of commitment by the contractor, and his undertaking to complete the scheme or refund a proportion of the State's contribution in respect of any curtailment.[1]

Besides making capital grants under assisted contracts the Ministry had in many cases supplied also the cash and material required in the manufacturing operations under these contracts. A departmental audit of contractors' records of this expenditure had to be carried out, and accounting for Ministry issues of material, both under these contracts and as free issues, was one of the most difficult problems of settlement. Attempts to compile satisfactory records of these transactions were not sucessful, except with regard to explosives material for which adequate accounts were kept. This question was continuously under consideration throughout 1920 by special officers, but in many cases general settlements with contractors included compromises in respect of the issue of materials, where great discrepancies existed between the Ministry's and contractors' accounts ; and in other cases a qualification was attached to the terms of final settlement to the effect that the contractor to the best of his knowledge had accounted for all material supplied and would disclose and account for any material which he should subsequently find had not been accounted for.

In July, 1919, the Co-ordinating Committee at the request of the Minister enquired into the progress of liquidation with a view to accelerating the work, as an enormous volume of transactions still remained to be dealt with, and in September the Minister appointed a committee under the chairmanship of the Financial Secretary of the Ministry to expedite liquidation in all departments and to ensure greater co-ordination between the liquidating and accounting departments. At the end of the year, the Chief Liquidator consolidated the various liquidating sections into one Contracts Liquidation Department to deal with cases then outstanding.

By the end of 1919 the liquidation of contracts was practically concluded, but there were numerous questions affecting the settlement of accounts which had still to be cleared up. With a view to accelerating this part of the work, Lord Inverforth requested the Treasury to concede a wide authority in regard to the settlement of accounts, and proposed

[1] Hist. Rec./R/400/6.

that a committee consisting principally of finance officers of the Ministry should be set up to exercise the extended powers which he desired. The Accounts Liquidation Committee was accordingly established at the end of 1919 to negotiate with contractors within certain limits on matters of account and price.[1] In a number of cases the committee found it necessary to refer the transactions to special officers for investigation, and it was not until the autumn of 1920 that final settlements with contractors began to be effected in considerable numbers. These settlements frequently took the form of compromises, since exact correspondence between the records of the Ministry and of the contractor could not be obtained without prolonged investigation.

(*d*) VARIETY OF METHODS.

The actual process of liquidation varied greatly in different classes of contracts. In some cases a number of contracts could be liquidated under one general agreement, as in the case of engineering supplies, contracts for which were settled on lines which relieved the Minister of contract obligations for articles having a post-war use on an all-round basis of 12½ per cent. of the cost, while, with regard to special tools having no post–war use, the terms of the break clause were applied. In aircraft contracts on the other hand, the Liquidating Committee found it impossible to delegate any authority to make settlements, and themselves examined each contract on its merits.

The kind of settlement which the Minister sought to make with contractors was to ascertain what the Ministry's liability would have been had output continued to the end of the period of notice, and then to agree with the contractor to cease production before the end of the period of notice, any saving so effected to be shared between the Minister and the contractor, provided always that any labour thus released from war production was employed by the contractor for other purposes.

The ease with which the liquidation of contracts was effected and the methods applied in liquidation depended to a great extent on four conditions :—

(1) the peace demand for a war product ;
(2) the extent to which shops had been laid out and equipped specially for war work in contradistinction to the adaptation of peace equipment to war work ;
(3) the production period of the product ;
(4) the peace value of materials and semi-manufactured goods.

Thus the cancellation of gauge contracts was greatly facilitated by the eagerness of manufacturers to turn over to peace production, and claims for compensation were small. Optical munitions and glassware contracts were easily disposed of, and the labour employed was readily turned over to civil work. Similarly, on account of the demand for mechanical transport, such contracts were liquidated with very small payments by way of compensation. In this case, the trade demand, besides being large, was of the same nature as the war demand and it was possible to arrange for the acceptance by the Minister of a comparatively small proportion of the vehicles for which he was liable under the break clauses.

[1] HIST. REC./R/400/6.

It was found possible to reduce compensation claims on explosive contracts, which would otherwise have been large, by permitting the sale of such products as toluol and benzol to private consumers during the period of notice.[1] Guns, ammunition, aircraft, and most other war-like stores could not, however, be disposed of by the manufacturers to private individuals, and any continuance of output entailed heavy acceptances by the Ministry of stores surplus to requirements.

Contracts for guns and gun ammunition were in the majority of cases terminated by notice immediately after the Armistice. Some of the small contractors for guns had used their existing plant, balancing it where necessary by the addition of machinery suitable for ordnance work. These additional tools were introduced without seriously interfering with the original capacity, and such firms were able to revert immediately to their former trade. The large armament firms had on the other hand laid down special shops, plant, and appliances for ordnance work, and these could not be rapidly converted to the requirements of peace. Instructions to cease work immediately would in such cases have resulted in the disbanding of labour and large compensation, as it required five or six months to re-equip the shops. In the same way, works for the production of aero-engines had been specially equipped. Contractors had in most cases been motor car manufacturers before the war, but the return to peace production could not be expeditiously carried out on account of the difference in tools and fittings required, while aircraft works were, in general, products of the war period, and had no peace production to which they could revert.

Chemical warfare contracts were in all cases for very short terms, and presented no difficulty in liquidation, but contracts for munitions which had a very long production period presented great difficulties in settlement. A sudden termination would have involved heavy payment for half completed work, which would have had no disposal value, and in certain cases, notably those of aircraft, aero-engines, railway material and certain guns the policy was adopted of taking delivery of articles which it was cheaper to finish than to abandon. This policy also alleviated the labour problem to a certain extent, and in the case of the 18-pdr. equipments was the means of facilitating agreement as to other contracts. Contracts for 3,600 of these equipments were running at the Armistice, and there was a vast accumulation of special material and stores for their production. The War Office had requested that any production, the continuance of which was necessary for labour reasons, should be concentrated on the 18-pdr. equipment, and these contracts were continued for many months after the Armistice.[2]

A similar policy with regard to aircraft led to heavy deliveries throughout the spring of 1919. In the week ending 3 May the deliveries were 283 aeroplanes, 264 engines, 6 seaplanes and 6 boat seaplanes, while on 26 July there were still due for delivery 3,628 aeroplanes, 162 seaplanes, 82 boat seaplanes, and 5,180 engines,[3] though these were afterwards reduced as a result of further liquidation. These large deliveries were in part due to the long term of the war break clause which

[1] HIST. REC./R/520/1. [2] Sec/Gen/1174.
[3] (Printed) *Weekly Reports*, Nos. 191, 203, I. (3.5.19, 26.7.19).

had been inserted in aircraft contracts as an inducement to contractors to undertake the work. In the case of engines the period was four months and of aeroplanes three. Any shortening of the period of notice would have resulted in heavy claims for compensation. The result of this arrangement was that after the application of the war break clauses nearly 14,000 aeroplanes and an equal number of engines of modern types, involving a liability of some £28,000,000, remained to be delivered.[1]

In cases where the peace value of materials and semi-manufactures was great, production was stopped as soon as possible, in many cases with little difficulty. The liquidation of contracts for mechanical transport was greatly facilitated since spares and semi-manufactured parts served equally well for trade vehicles. Aircraft contracts, on the other hand, were more difficult to settle because the material is cut up at a very early stage and has little residual value apart from the complete machines. Considerable ingenuity and investigation were expended in finding uses for semi-manufactured stores.

In a number of cases the processes of liquidation resulted in considerable saving on the unliquidated commitments at the time of the Armistice. The accompanying table shows the savings effected up to March, 1920.

Saving effected on Liquidation up to March, 1920.

Department.	Saving effected.	Percentage of saving on unliquidated commitments, as at 11 November, 1918.
	£	
Guns	7,579,385	32·4
Gun Ammunition	10,676,397	36·4
Small Arms and Machine Guns	2,503,389	34·3
Small Arms Ammunition	3,645,749	70·0
Mechanical Warfare	29,646,863	73·0
Non-Ferrous Metals	1,311,861	30·4
Iron and Steel	2,954,076	95·8
Gauges	117,643	35·0
Machine Tools	1,776,456	73·5
Optical Munitions and Glassware	2,978,610	63·5
Timber Supplies	2,365,172	48·6
Railway Materials	2,176,893	38·8
Agricultural Machinery	144,845	43·6
Area Organisation	2,986,619	48·9
	70,863,958	51·5

III. The Disposal of Surplus Government Stores.

(*a*) General Policy.

The guiding principle of the policy adopted by the Disposal Board was to secure the best possible bargain for the national Exchequer. Costs of administration and storage, difficulty in securing tonnage and

[1] Hist. Rec./R/520/11.

guarding property awaiting disposal restricted to some extent the choice of place and time for sales, so that the prices realised, though the highest obtainable in the circumstances, were possibly not always as high as those which might have been obtained under more favourable conditions. Further, the necessity of restoring production in this country to its normal channels, and thereby increasing employment, led in several cases to the adoption of a policy of rapid disposal though higher prices might have been realised had sales been postponed. The rule of requiring the full market price was only departed from on grounds of national policy, as in the case of huts required for temporary housing purposes, or in view of industrial, military or transport conditions, and definite authorisation for such a departure from policy was always insisted on. The market value was invariably taken as a basis of price, and this rule worked sometimes in favour of and sometimes against the Board. Where possible, as in the case of chemicals and explosives, materials were restored to consumption through the normal channels, and in some cases it was arranged that a certain proportion of the material sold by the trade was drawn from government stocks.

Quick sales were specially expedient in the various theatres of war, as pilfering was difficult to prevent, and the danger of deterioration and cost of storage were serious factors. Though quick clearance was of importance, great care was necessary to prevent purchases by dealers who might hold up stocks for profiteering purposes. The danger of injury to trade by too sudden disposal had also to be considered.

In September, 1919, quicker disposal became imperative, because the greatly increased amount of surplus stores which were declared after the signing of peace, led to serious difficulties in relation to storage and guards. The Minister urged that sales should be accelerated; controllers were granted a free hand in accepting prices, and the policy was adopted of negotiating sales of blocks of stores to merchants by private treaty, these blocks in many cases representing the whole stock of certain articles.

Cases constantly arose in which the Board was asked to grant favours in respect of opportunity for purchase or of price to certain persons or organisations. It was decided that no preference should be given to individuals or associations, but that right of pre-emption at market prices might be given on grounds of public policy to local authorities and similar bodies. The Board also decided not to consider requests for loans of surplus material or stores, the only exceptions being certain huts, and the stocks of radium, of which it was desirable to retain control in case of another war. The radium was lent to the Medical Research Committee for six months at 4 per cent. per annum on its capital value, for cancer research at the Middlesex Hospital.

The settlement of a policy of disposal in foreign countries was very difficult. Treasury views as to the expediency of disposal to foreigners from the point of view of the exchange, War Office views as to the urgency of disposal in the light of diminishing facilities for providing guards as demobilisation proceeded, and various political considerations as to the continuation of the blockade, conflicted with

each other and with the general policy of the Board. The Treasury favoured disposal to neutrals in order to improve the exchanges, but the blockade was exceptionally severe in the case of Holland and the Scandinavian countries, which were the keenest purchasers of surplus stores. The Treasury also desired that all plant such as port, railway and dock equipment, which had removal value and would be of service in restoring industrial activity at home, should be brought back, but the shortage of shipping caused the War Office to urge the disposal of everything possible abroad.

The difficulty experienced by the War Office and Air Ministry in providing sufficient military guards as demobilisation continued, caused them to press the Disposal Board to accelerate sales, even at the expense of prices, but prolonged difficulties in evolving arrangements acceptable to the French and Belgian Governments, militated against meeting the views of the War Office in this matter. It was laid down by the Treasury in January, 1919, that all sales to private purchasers in Allied countries should be for cash in London. It had been found, however, that the most successful method of sale in Allied countries was disposal in small lots, and it was impracticable to do this except for cash in local currency,[1] and this method was approved by the Treasury. The Treasury disapproved on exchange grounds of any sale to the Italian Government, but countenanced sales to private Italian purchasers for lire. The Italian Government, however, demanded the first option of buying surplus stores in Italy, and similar difficulties arose with the French and Belgian Governments with regard to private sales in their countries.

Any sales in France were, of course, dependent upon the consent of the French Government, who at first desired that all sales should be made to the Government on a credit basis, and that any stores not so sold should be removed from France. This would have limited the Board's market in France very seriously, and the extreme claim to a monopoly of purchase was not persisted in. A further complication was introduced and sale to private purchasers considerably restricted by uncertainty as to the liability of purchasers to pay customs duties on goods purchased from the Board. During the war, all material required by the British Army was imported into France free of customs duties and other dues. When, however, the sale of such material was contemplated, the French Government was naturally unwilling to lose any revenue which was legally leviable, and there was also the possibility that the sale of large quantities of stores would react unfavourably upon French producers. For these reasons the French Government were urgent that all stores not sold to them should be at once removed. On stores sold to the Government the question of duty did not, of course, arise.

In order to place them in a more favourable position for pressing the French Government to waive these claims for customs, the Disposal Board succeeded in inducing the Treasury to waive similar claims made by the British Government for import dues on American cars introduced for war purposes into the United Kingdom. The Board's contention

[1] D.B./Sec/66.

was that while the waiver of duties by this country would be limited to stores of relatively small value imported from the States, its refusal would prejudice their position in obtaining concessions, relating to vast quantities of stores, not only in France, but in Italy, Belgium and Greece. Moreover, the duties levied on the Continent were in general much higher than those levied by the British Government. In June, 1919, the Treasury agreed to the waiver of duties on American stores.

It was finally arranged that all stores lying in certain areas were to be purchased, at the Board's valuation, by the French Government, the Board having the option of removing any material to England, but not of selling it to private purchasers in France. With regard to all other stores in France belonging to the British Government, lists were to be submitted to the French Government, who should have the option of purchasing at the Board's valuation. Any goods not so purchased might be sold by the Board to private purchasers, and on all such sales the Board should pay to the French Government a sum representing 10 per cent. of the proceeds, as a composition for all charges leviable under French law.

The policy of the Belgian Government was in the main to leave purchase to private enterprise, and the greater part of the material in Belgium was disposed of by means of small sales. These sales were facilitated by an agreement with the Belgian Government on the subject of import duties, whereby a flat rate of 3 per cent. on all sales was to be charged.

The Italian Government agreed to waive all import duties on condition that they might pay in lire instead of sterling for all purchases of surplus stores made by them.[1]

The Disposal Board had been vested by the Government with responsibility for the sale of all surplus stores, but it was found advisable in certain cases to delegate the powers of the Board, either because the concession was necessary to dispose profitably of small quantities of material *in situ*, or because another Department possessed an organisation specially adapted for the purpose. Thus, authority was given to each of the Services to dispose independently of small quantities of produce and unserviceable stores, and in August, 1920, in order to assist the clearance of dockyards and depots, the Admiralty was empowered to make large sales of such material. Since the Board of Admiralty possessed the necessary technical staff, sales of non-rigid airships and portable sheds were also delegated to it.

The question of the adaptation of surplus war material for peace purposes was one of great importance, from the point of view of disposal, and in March, 1919, the Minister appointed a committee to investigate the possibilities and make recommendations. This committee was assisted by numerous sub-committees of experts, and their experiments resulted in recommendations which were turned to useful account. Quantities of surplus shells were sold at considerably over scrap value for conversion into tubes, pit props, disc wheels, standard gauges, etc., and tank and aero-engines were adapted for commercial purposes.

[1] Minutes of Disposal Board, 771, 820.

Daylight signalling lamps were converted into motor lamps, and obsolete types of aircraft magnetos adapted for motor vehicles with a consequent increase in their sale value.

This committee assisted disposal controllers by giving general rulings as to the best method of disposing of certain classes of stores. It was found towards the end of 1919, that the Advisory Committees and technical sections attached to disposal controllers were able to deal with these questions, and the committee was dissolved in October.

Soon after the appointment of the Board, the desirability of establishing a special section to deal with the disposal of surplus stores in foreign countries through the medium of large exporting and agency houses was considered. A section was established in February, 1919, under Sir Sydney Henn, whose duties were to widen the markets as far as possible, to interest British firms trading with foreign countries in the sale of government property in any foreign country where the Board had not already set up a selling organisation, and to introduce prospective buyers to the disposal controllers concerned. A city office was opened on 5 May, 1919, but its usefulness was from the beginning somewhat curtailed by the difficulty of co-operating with the various controllers. The office was, however, instrumental in introducing buyers, especially for textile goods, and a very useful sample room was set up. In October, the question arose as to whether it would not be preferable for the Board to be represented directly by representatives abroad,[1] instead of acting through the city office. It was finally decided that as far as practicable, export business should be dealt with through the ordinary British houses; the city office was retained and an export department[2] created in April, 1920, consisting of six or seven men with commercial experience, to study the requirements of the export market, and to take up the question of advertising abroad. It was, however, recognised that there were certain articles which could not be disposed of through the ordinary channels, as it was necessary to introduce them to the buyer by a representative competent to discuss their actual utilisation in the country in which it was desired to sell them. It was also considered desirable to encourage buyers to visit this country, and this could only be achieved effectively by personal visits. Four representatives were, therefore, appointed for this purpose.

In April, 1920, it was found that the city office was not being used sufficiently to justify its retention. By September it was felt that everything had been done which could be effected by a central organisation in interesting foreign purchasers, and the export department was closed, controllers from that time making provision in their own sections for dealing with export requirements.[3]

In two theatres of war, i.e., Italy and the Near East, the policy of establishing a trading corporation as agent for the Board was adopted. The British Trade Corporation had in November, 1918, approached the Disposal Board with a suggestion of this nature, with regard to the stores in Near Eastern theatres. On the formation of the new Board,

[1] Minutes of Disposal Board, 1274. [2] *Ibid.*, 1293.
[3] Disposals Memorandum, No. 79.

the matter was taken up and an agreement was arranged with the Corporation on 31 March, 1919. The Corporation was regarded as acting throughout as the Board's agent and not as a principal, the Board remaining free to act through its own Commissioner in any instance in which it was considered desirable.[1]

An agreement on similar lines was made with the British Italian Corporation to act as agents on a commission basis for the disposal of stores in Italy. Several syndicates offered to act as agents for the Board in Belgium, but in this case great caution was necessary, lest the appointment of such an agency should be represented as an exploitation of Belgium for private interests. It was finally decided that such an arrangement was unnecessary.

In the earlier stages, the custody of stores declared surplus remained with the declaring Department, this being necessary because the Disposal Board had no staff to undertake the work, either in the different theatres of war or at home, and the formation of such a staff would have been uneconomical, as it would have involved the physical separation of surplus and non-surplus stores in various depots, and separate store-keeping and accounting.

The progress of demobilisation during 1919 made the burden on the declaring Department increasingly onerous, and the collection of stores for peace-time requirements and for war reserves, with the consequent segregation of much of the surplus material, greatly affected the problem. The position was reconsidered at the end of 1919, and in January, 1920, it was decided that where depots, etc., contained only surplus stores, such depots should be transferred to the Disposal Board, which thereupon became responsible for storage, custody and accounting. This decision involved a large increase in the work of the Ministry, and resulted in their taking over 238 depots and stores from the War Office and Air Ministry at home, and the physical custody of surplus stores in France, Italy and Salonica, with effect from 1 February, 1920. Special questions of policy arose with regard to the disposal of certain property, notably aeroplanes and ammunition. The future of the national factories also raised special problems, some account of which is given below.[2]

The disposal of aeroplanes was exceptionally difficult owing to the large quantities available, the difficulty of storage, the rapid rate of deterioration and the almost entire absence of demand. Civil aviation was not permitted until 1 May, 1919, and absence of a decision as to the sale of warlike stores prevented the disposal of aeroplanes to foreign Governments in any quantities. The important question of the adaptation of war machines for commercial use still remained unsolved in the summer of 1919. Owing to the anomalous position of the technical section of the Department of Aircraft Production, neither the Air Ministry nor the Disposal Board had any means of coping with the problem, and contractors had not found it possible to alter machines suitably.[3] There was no data for ascertaining market value since comparison could be made neither with the position before nor during the war. It was obvious that supply exceeded demand very

[1] Disposal Board Minutes, 191. [2] *See* below, pp. 32-42. [3] M./Demob./167.

considerably and under such conditions two courses were possible. The whole of the stocks might be thrown upon the market without reserve, or the greater portion might be kept back and be eventually reduced to scrap, and the remainder sold at good prices in the limited market. The latter policy was adopted by the Board, as being likely to secure better returns to the State, and to be more helpful to the aircraft industry. In pursuance of this policy, the Air Ministry was asked to advise the Board of the surplus machines, in the order of importance regarding the clearance of the depots. Inspecting engineers were then sent to decide which machines should be removed to Ministry of Munitions depots. The rest were dealt with as scrap and disposed of on the spot. The machines sent to Ministry depots were sentenced on arrival according to their flying condition. Those in serviceable condition were stored under cover, and those requiring an expenditure of £150 or more on repairs were denuded of their engines, instruments and certain other parts, and disposed of as scrap as they stood.

Drastic reductions in the peace establishment of the Air Force, at the end of August 1919, resulted in the notification for disposal of some 8,000 additional aeroplanes and about 19,000 engines. There were already in the Board's depots 4,689 aeroplanes and about 16,930 engines. It was therefore necessary to reconsider the policy of disposal in the light of storage possibilities. The Air Ministry was pressing for immediate evacuation of their depots which they were unable to keep open owing to lack of personnel. The most saleable machines were selected for storage up to the full capacity of the Disposal Board's depots, and the rest were reduced to produce.

Up to this time the policy of the Board had been that of gradual disposal to a number of purchasers. In view of the slowness of this method and the heavy cost of storage, the Board considered favourably an offer for a block purchase of all surplus machines and engines which was received in October 1919. In March, 1920, an agreement was signed with the Aircraft Disposal Company for the purchase of all surplus aeroplanes, engines and A.G.S. parts in the United Kingdom at that date for £1,000,000, and 50 per cent of any profits which might be realised on resale.

The disposal of surplus loaded ammunition required a good deal of consideration. It was essential that such material should not get into the hands of irresponsible persons, and that breaking down operations should be conducted only under the supervision of experts. In England ammunition was at first broken down at Woolwich and at some of the national factories, and served a useful purpose of keeping labour employed. During the early part of 1919 clean ferrous scrap was available in such large quantities that merchants would not consider the purchase of ammunition which required breaking down before it was available for scrap. Later in the year, however, supplies of clean scrap fell off, and it became possible to find contractors willing to purchase ammunition in large quantities for breaking down in their own factories.

The question of breaking down surplus ammunition in France was considered as soon as the Disposal Board was formed. It was thought that if it were possible to dispose of the material in France free of

tariff duties, there would be a large profit for any company undertaking the work, while all risks attending the transport of this dangerous material would be avoided. The customs question was only one among many difficulties and breaking down in France did not at that time seem to be a commercial proposition. The question soon arose again on account of the shipment of large quantities of ammunition to England which could only be broken down at a loss. Arrangements were made in May to set up four breaking down factories in France under the superintendence of an expert officer of the Board. An English firm also undertook breaking down operations at Bourbourg, on terms under which half the net profits on the transaction were to be paid to the Board. German ammunition was supplied free of charge, but the British ammunition was paid for by the contractor.

An offer was made by a syndicate in February, 1920, to purchase the whole of the loaded ammunition in England, and all theatres of war. Negotiations were however proceeding with a French syndicate for the surplus ammunition in France, and also for the breaking down factories there.[1] The negotiations with the French syndicate broke down.[2] During 1920 the filled ammunition and components in Great Britain were sold in several large blocks and the whole surplus of ammunition in France was sold to an English contractor in June, 1920.

German ammunition was broken down in German factories at Cologne as the residual value was low, and the cost of transport to England very high.

(*b*) Difficulties Encountered.

At the outset, the Disposal Board was confronted with numerous difficulties connected with the interpretation of the scope of its responsibilities. The various Departments which had in the past conducted their own sales of surplus stores could not at once adjust their arrangements to the new system, and temporarily some doubt existed as to the precise definition of the stores with which the Ministry of Munitions had been deputed to deal. In some quarters the function of the Board was interpreted to be the disposal of surplus 'war stores' in a restricted sense, excluding property belonging to Civil Departments and such property belonging to War Departments as could not strictly be described as war stores. The intention of the Cabinet had, however, been to entrust the Ministry with the disposal of surplus government property of all descriptions, and arrangements had to be made with other Departments for a complete transfer of their responsibilities for sales. The work of the Board in connection with War Office stores was greatly facilitated by the action of the War Office in centralising the work of dealing with notification of surpluses in one department. This department received reports of all surpluses at home and abroad, co-ordinated them and transmitted them to the Board for action.

The transfer of functions from the Admiralty presented greater difficulties. Pending the formation of the Disposal Board, a provisional arrangement had been made in December 1918 for direct sale by the Admiralty of dockyard stores as well as ships. Later, the sale of

[1] Disposal Board Minutes, 1454. [2] *Ibid.*, 1484.

dockyard stores was transferred to the Board, but the need of clearing storage space at dockyards was urgent, and the Admiralty did not wish to incur any delay by referring tenders to the Board before acceptance. They therefore submitted to the Board for observation copies of tender forms already issued, thereby rendering effective control by the Board impossible. The independent action of the Admiralty resulted in overlapping of sales and disturbance of markets, and a clear definition of functions as regards dockyard sales became essential. It was not however until October 1919 that agreement was reached. It was then decided that ships' equipment, defined as meaning compasses, anchors and other stores useful solely for marine purposes, should be disposed of by the Admiralty; that scrap, naval timber and wireless telegraph apparatus should be disposed of by the Admiralty in close liaison with the Board; and that the Admiralty should have discretionary power to effect sales of produce and unserviceable stores up to a limit of £250 without reference to the Board, while all other property should be transfered to the Board for disposal in the usual manner.[1] Owing to accumulations of stores at the dockyards, etc., representations were made by the Admiralty, with the result that in August, 1920, the limit for these sales was raised to £1,000.

During the first few months of its existence the operations of the Disposal Board were greatly hampered by delay in the declaration of surpluses. Apart from stocks in its own possession the Ministry could take selling action only after the various Government Departments had considered their post-Armistice requirements and were prepared to to declare their surpluses. In this matter the declaring Departments were necessarily hampered until the signing of peace with Germany on 29 June, 1919, and it was not until after that date that the declaration of the great mass of surpluses began. The disturbed state of affairs in the Near and Middle East which continued after the signing of the peace with Germany further militated against declaration.

(*c*) METHODS OF SALE.

There were four possible methods of sale of government property, auction, public tender, private treaty and retail sale. It was suggested in Parliament that the first method only should be used, but it was clear that this would not be the best means of disposal of all classes of material and the Minister gave the Board discretionary power to adopt the method which was most suitable in each case, subject to the condition that the first two methods should be used wherever possible, and that all property should be fully advertised. Auction sales were found to be the best method of securing high prices where demand exceeded supply, or where there was a general demand, as in the case of mechanical transport vehicles. Sale by public tender was adopted in general for factory disposal, and for stocks of material for which there was no general demand. Sale by private treaty was found more advantageous in the case of certain factories and of materials of which the supply exceeded the demand.

[1] Disposals Memorandum, No. 41.

It had been laid down by the Minister at the outset that all sales by private treaty should be immediately reported to the Disposal Board. It was soon found that sale by private treaty would be necessary to an increasing extent, for in the case of special stores, such as dock plant and optical instruments, where the demand was limited to very few purchasers, sale by negotiation was the best method of disposal. In certain cases it was found that previous advertisement was either impracticable or wasteful, and in May 1919 controllers were empowered after the insertion of advertisements of a general nature to make sales up to £250 without detailed advertisement. Controllers were also given fuller discretionary powers in regard to sales by private treaty, and were authorised to make sales to the value of £5,000 without reference to the Board. Sales above that value had to be referred to a member of the Board before settlement. After these instructions had been issued, the number of sales by private treaty increased so much that the reporting of each case to the Board was waived,[1] but each Group Member was responsible for a weekly examination of all such sales in his group.

Agreements for sale by private treaty took various forms according to the nature of the stores dealt with. In some cases where the market price was easily established, prices were arranged by agreement, as in the cases of the sale of the whole surplus stocks of aeroplane linen and balloon fabric. Some of the aeroplane linen had been sold direct in small quantities, but the organisation of the Board was not adapted to this method. Efforts to sell to or through the manufacturers had proved unsuccessful, and it was therefore decided to dispose of the whole stock to a commercial organisation capable of undertaking distribution. A firm in New York offered to take a large consignment of linen into their bonded warehouses for sale on commission, but the Associated Manufacturers' Company (Mr. Martin) offered to purchase the whole of the surplus linen at 1*s.* 7*d.* a yard, payment to be extended over a period of six months. A similar offer was received from another quarter to purchase the stock at 1*s.* 8½*d.* a yard, but payment was to be extended over a period of two years, thus involving a great deal of extra expense in storage and administrative charges to the Board. Mr. Martin subsequently increased his price to 1*s.* 8*d.* a yard, and a contract was entered into with him for the sale of the entire stock, a sum of about £3,000,000 being involved in the transaction. A similar contract was made for the whole stock of grey balloon fabric at 30 per cent. below cost price, after wide advertisement for sale by tender had failed, the fabric not being of a standard used by the trade and requiring special treatment to render it serviceable.

In other cases where the commodities sold were not of a uniform character the price was arrived at by a valuation. Thus furniture which had been placed in buildings belonging to local authorities during their occupation by Government Departments was sold where possible by private treaty, at a valuation, to the local authority concerned. All sales to other Government Departments were carried out by private treaty, prices being agreed by the controllers concerned on a basis of

[1] Disposals Memorandum, No. 12.

market value. Many sales to private traders were effected at catalogued or agreed prices. Thus the whole surplus of Beardmore aero-engines were purchased by Messrs. Beardmore at prices based on an independent valuation.

In the summer of 1919 sales of large blocks of stores by private treaty became increasingly numerous as the Board was pressed to accelerate disposal, and problems of storage and custody become more difficult. In some cases these sales included the whole remaining stock of certain classes of material, and were of great value as they rendered possible the clearance of stores and the release of administrative personnel. Instances of this have been mentioned above in the sale of aircraft linen and balloon fabric.

The final clearance of all stocks of mechanical transport was effected early in 1920 by two large block sales. In January, 1920, the whole of the mechanical transport vehicles parked at St. Omer in France were sold to Messrs. Leyland for £500,000. In April an agreement was entered into with Sir Percival Perry for the purchase of the whole of the mechanical transport vehicles and material at that date the property of the Disposal Board, together with all other such property which might within the next two years become the property of the Ministry, for £3,650,000. The purchaser also undertook to pay an agreed percentage on the sums realised by sale of vehicles.

Factory consumable stores were similarly disposed of by means of a block sale. They represented a class of material, the sale of which was very difficult and which would have necessitated an expensive organisation if favourable prices were to be obtained. A proposal made in January, 1920, by Messrs Rownson, Drew and Clydesdale for the purchase of the whole of the factory consumable stores and a certain quantity of other materials, such as semi-manufactured ferrous metals and builders' ironmongery, on a system of monthly payments was favourably considered and finally approved by the Board.[1]

Another arrangement was made in August, 1920, for the sale of a quantity of miscellaneous stores to the Miscellaneous Disposals Syndicate on a profit-sharing basis with the Board.[2] This contract was used as a means of disposing of a mass of heterogeneous material.

Though retail sale on a large scale was never adopted by the Board, as far as practicable stores were sold in small lots by auction, so that individual buyers might have an opportunity to purchase. For example, 5,000 second-hand blankets were sold at Douglas, Isle of Man, by auction. The first 2,000 were sold in pairs to small buyers, and this having satisfied the demand of individual purchasers, the rest were sold in lots of 50 pairs. The need for sale in small lots was particularly great in the case of machine tools, to prevent the small merchant from being squeezed out of the market by the big middlemen.

Difficulties in disposal during the summer of 1919 led to the consideration of retail trading as a possible method, and a committee of representatives of the large retail houses was asked to advise the Board on

[1] Disposal Board Minutes, 1418, 1478. [2] *Ibid.*, 1679.

this subject. It was decided that the difficulty of creating selling organisations of a temporary character, and of obtaining accessible premises on very short leases, made this method impracticable.

Experiments in retail sales of factory consumable stores at Earl's Court and of local retail sales at the Hayes Central Stores Depot had not been successful, and as there were already in existence in all parts of the country, distributing houses of all kinds and sizes, which were the natural distributing agents to the consumer, there appeared to be no reason why the Government should set up a similar organisation in opposition to traders. Retail disposal by auction, tender or private treaty was continued with stores such as motor-cars and lorries, machinery and furniture, which experience has shown could be disposed of most profitably by these means, while the support of the large retail houses was enlisted for the distribution of articles of general consumption.

Certain stores which presented great difficulties in sale were finally disposed of through firms on a commission basis. Case boards were sold by this means, which also proved useful for disposing of certain salvage dumps in France. Arrangements for the disposal of the Zeneghem Metal Dump became urgent in the autumn of 1919, and a contract was signed in September with a syndicate of four of the principal scrap merchants known as the Zeneghem Salvage Control for the disposal of the dump on a commission basis. The material was to be sold at the best price obtainable and the contract provided for the fixing of prices by the Board's Commissioner in France in consultation with the Syndicate, in order to prevent markets being affected by possible under-selling on the part of the Syndicate. The miscellaneous dump at Zeneghem was entrusted to the same contractors, and this form of contract, which was considered very favourable to the Board, was applied very extensively to other dumps with a view to rapid disposal and simplification of the transport problem.[1] The disposal of very large stocks of jute materials, etc., which became surplus was effected by a similar method. Messrs. A. & S. Henry of Manchester, who were responsible for buying the material during the war, placed their organisation at the service of the Government, and an arrangement was made with them to sell the surplus stock on a commission basis. The result was very satisfactory.

IV. Demobilisation of National Factories.

(*a*) Preparations for Demobilisation.

The future of the large number of factories which were controlled by the Ministry of Munitions during the war[2] was one of the questions which occupied the attention of the Council Committee on Demobilisation and Reconstruction. There were about 250 establishments whose post-war use or disposal had to be decided, the term national factory being taken to include factories managed under agency agreements in which the wages and other outgoings were paid by the Ministry, as well as those directly under government control.

---

[1] The disposal and decontrol of metals and other materials are dealt with in Vol. VII, Part I, Chap. V.

[2] For details, *see* Vol. VIII, Part II.

In the recommendations of the committee, which were submitted in a summarised form to the Minister of Reconstruction in June, 1918, the factories were classified in four groups—[1]

(*a*) About twenty factories, apart from the Royal Ordnance Factories, were recommended for permanent retention as munitions factories.

(*b*) About eighty-five were suitable for eventual disposal or use as industrial concerns.

(*c*) About twenty-five, including some of the large filling factories, were not suitable for industrial purposes but might be utilised temporarily as stores.

(*d*) About 115 would revert to their original owners and pre-war uses on or soon after the cessation of hostilities.

This classification of the factories formed the basis of the policy which was followed during the period immediately succeeding the Armistice.

It had been decided in December, 1917, that government factories should not fall within the jurisdiction of the Surplus Government Property Advisory Council. In the autumn of 1918, however, the procedure for disposal was considered by the Economic Defence and Development Committee of the War Cabinet, and it was arranged that national factories should be disposed of through the ordinary channels, as they became surplus to requirements, the approval of the Minister of Reconstruction being first obtained in each case. At the beginning of October a War Cabinet decision empowered the Ministry to negotiate the sale or lease of any factory.[2]

(*b*) The Royal Ordnance Factories.

The three government arsenals known as Royal Ordnance Factories, Woolwich Arsenal, the Royal Small Arms Factory at Enfield, the Royal Gunpowder Factory at Waltham Abbey, together with the Royal Aircraft Establishment at Farnborough, were in a class by themselves. They were the only establishments in which the manufacture of armaments under direct state control had been carried on before the war, and the question of their post-war use presented problems different to those raised by the new national factories created during the war.

The future administration and use of the Royal Factories, and particularly of Woolwich Arsenal, were the subject of much consideration, both before and after the Armistice. It is not possible to do more here than indicate the main outlines of policy with regard to these establishments.

---

[1] Report on the Work of the Munitions Council Committee on Demobilisation and Reconstruction for the year ending 30 September, 1918. (Hist. Rec./R/264.2/3).

[2] Committee on Demobilisation and Reconstruction Serial, No. 172. (Hist. Rec./R/1122/20); Minutes of the Co-ordinating (Supply and Demobilisation) Committee, 17.12.18. (Hist. Rec./R/1000/61).

In July, 1918, a committee, under the chairmanship of Mr. M'Kinnon Wood, was appointed by the Minister of Munitions, with the following terms of reference—

> "To enquire into and report upon the control, administration, lay-out and equipment of the Royal Ordnance Factories at Woolwich, and the nature and distribution of the work carried on in them and in the Arsenal generally, and to advise the Minister of Munitions what, if any, changes are required."

It was originally intended that this committee should later investigate the factories at Enfield and Waltham Abbey, but this was not carried into effect.

In their three interim reports, dated 6 November and 22 November, 1918, and 12 February, 1919, the committee reviewed such questions as safety conditions and costs, as well as more general matters relating to the functions and administration of the Arsenal.

From the point of view of policy the most important conclusions were—

> (1) That the arguments in favour of the retention of a government arsenal for munitions manufacture in peace time are overwhelming, and that the location of that arsenal should be at Woolwich.
>
> (2) That Woolwich Arsenal should be organised mainly as a peace establishment for the supply of armaments in peace-time, and of experimental types and improved design in war and peace; and that its reserve of expansion so far as its peace lay-out was concerned should be limited to increased production in the case of small wars.
>
> (3) That one Minister only should be solely responsible for the control of the Arsenal.

The committee also laid special stress on their recommendations that Woolwich should cease to be used for the storage of munitions and other completed stores, especially explosives; that the Arsenal should be organised on commercial lines; and that an expert committee should be appointed to submit proposals for the reorganisation of the lay-out.[1]

The three questions of policy indicated above were approved by the Cabinet in May, 1919.[2] The removal of filled ammunition from Woolwich and the reduction of stocks of explosives were further considered by a committee of which Sir F. Nathan was chairman, which was appointed to advise on the general question of removal, storage, and safe custody of Ministry explosives. This committee, in July, 1919, recommended not only that the Arsenal should cease to be used as a store for filled shell, mines, bombs, etc., but that the filling of such stores there should also be discontinued. In order to give effect to these recommendations it was arranged that the filling work then done at Woolwich should be allocated between the Banbury and Hereford National Filling Factories, which it was proposed to retain.[3]

---

[1] Sec./Gen./2251; M.C./725.

[2] Sec/Gen/842.

[3] (Printed) *Weekly Report*, No. 202, I. (19.7.19); Co-ordinating Committee Minutes (11.9.19).

In July, 1919, the Minister of Munitions appointed a standing Advisory Committee to advise him on questions affecting the administration of the Royal Ordnance Factories and to assist in giving effect to the recommendations of Mr. M'Kinnon Wood's committee. One of the most important questions considered by the committee was the question of providing work other than armaments at the Arsenal. Though the general policy of the Government was that the State should not manufacture in competition with private trade,[1] it was decided that in order to maintain a sufficient number of employees at Woolwich,[2] orders for commercial articles should be given. For a few months after the Armistice the Arsenal was engaged principally on repair and breaking down, the manufacture of certain types of new shell and filling for the Admiralty. Early in 1919, an order for milk churns required by the Ministry of Food was given, and in the summer the manufacture of railway locomotives was sanctioned. Other civil work undertaken during 1919 included the production of railway wagons, war medals and penny blanks and the repair of railway wagons and motor vehicles. The policy of providing alternative work was the subject of considerable controversy. On the one hand continual pressure was exercised against the discharge of labour ; on the other there were strong views against government factories undertaking commercial work, a formal protest, for instance, being made in August, 1919, by the Dairy Appliance Manufacturers' Association against the manufacture of milk churns.[3]

The Woolwich Advisory Committee drew up recommendations for the re-organisation of the Arsenal on the lines suggested by the Committee of Enquiry, and these were submitted to the Cabinet.[4]

The whole question of the administration of Woolwich was, however, closely bound up with the fate of the projected Ministry of Supply, and pending a decision on that matter little could be done with regard to the Ordnance Factories. When in March, 1920, the Cabinet decided not to proceed with the Bill for establishing a Ministry of Supply, it was decided that the Royal Ordnance Factories should be transferred to the War Office to be administered under certain novel conditions, together with such of the new national factories as it was proposed to retain. On 1 June, 1920, accordingly, the Ministry of Munitions ceased to be responsible for Woolwich Arsenal, the Royal Small Arms Factory at Enfield, and the Royal Gunpowder Factory at Waltham Abbey.[5]

The Enfield factory had during the war been engaged mainly on rifle work, but had also made and repaired a certain number of machine guns. After the Armistice it was suggested by a local labour organisation that some of the plant might be used to produce peace-time requirements, and the possibility of orders for bicycles and other articles was considered early in 1919, but was not at that time found feasible.[6] Later on, however, component parts of railway wagons were made, and early in 1920 a contract for the repair of railway wagons was placed.[7]

---

[1] *See* below, p. 40.

[2] It was proposed to maintain the establishment at about the pre-war figure of 10,000.

[3] Sec/Gen/2251, 1646.

[4] Sec/Gen/2251.

[5] Sec/Gen/855a.

[6] D.D.G.E./E.M.4/610.

[7] Sec/Gen/2261.

The allocation of work to Enfield was dependent to some extent on the future of the National Machine-gun Factory at Burton-on-Trent, This factory was erected for the manufacture of Vickers machine-guns, but it had not reached the production stage at the time of the Armistice. It was originally decided, however, in view of the difficulties experienced in obtaining machine-guns during the war, that the factory should be completed and retained. It was engaged after the Armistice on machine-gun repair. During the early months of 1919 there was considerable discussion as to the desirability of retaining this factory, and in May it was decided that the repair of machine-guns should be concentrated at Enfield, thus employing labour which it was desired to retain. Burton was to be used mainly as a store, but the plant was to remain *in situ* as it was still contemplated that the factory would be permanently retained.[1] In the autumn of 1919, however, it was decided that the factory need not be retained in the hands of the State. It was put up for disposal, and sold in April, 1920, to Messrs Crosse & Blackwell. A provision for the retention of plant was included in the terms of sale, but was subsequently waived.

Enfield thus became once more the only government factory for machine-guns as well as for rifles. The reconditioning and repair of rifles formed the principal work undertaken during 1919.[2] It was also proposed that certain special work should be undertaken there ; plant for the manufacture of the Farquhar-Hill automatic rifle was transferred from the National Rifle Factories at Birmingham, and the equipment of the Coundon factory, which had produced special small arms ammunition, was similarly transferred. It was also intended at one time that revolvers should be made at Enfield and certain plant was purchased from Messrs. Webley & Scott, but its installation at Enfield was suspended early in 1920.

The Royal Gunpowder Factory at Waltham Abbey, which was of great antiquity, produced cordite and other propellants up to the time of the Armistice, when instructions were given to cease production. There followed considerable discussion as to the future of the factory. The costs of manufacture were high compared with those of the new national factories, the site was bad from the point of view of air raids, and transport conditions were also bad.[3] There was a strong body of opinion in favour of closing down the factory, but before the question was submitted to the Cabinet it was referred to a committee which had been appointed in February, 1919, to consider what use could be made of the large cordite factory which had been erected at Gretna. The committee came to the conclusion that there was no valid reason for retaining both Gretna and Waltham Abbey and that the former, being a modern and up-to-date factory should be kept in preference. It was suggested that Waltham might be used for storage purposes in connection with the Royal Small Arms Factory.[4]

These recommendations were approved but action was not taken on them pending the establishment of special committees which it was intended should consider the whole question of explosives production.

[1] (Printed) *Weekly Report*, No. 194, I. (24.5.19) ; Co-ordinating Committee Minutes (23.5.19). [2] D.D.G.E./E.M.4/631. [3] R.G.P.F.36. [4] Sec/Gen/455.

In the meantime certain special work was undertaken at Waltham, such as the extraction of saltpetre from gunpowder, and the manufacture of experimental fuse powder.[1] No decision as to the explosives factories had been reached at the time of their transfer to the War Office, and the fate of Waltham Abbey remained unsettled for another year. Ultimately, on 3 June, 1921, it was decided that the recommendations of the committee should not be followed, but that Waltham should be retained and Gretna released for disposal.

The permanent retention of the Royal Aircraft Establishment was not questioned, but there was a suggestion that it should be located elsewhere than at Farnborough since the War Office raised objections to its situation in the midst of the training area in the Aldershot Command.[2] From the end of 1918 the transfer to the Air Ministry of the Royal Aircraft Establishment, together with certain services performed by the Ministry, was under discussion, and the transfer took place on 1 January, 1920.

(*c*) FACTORIES PROPOSED FOR PERMANENT RETENTION.[3]

As has been seen, it was originally contemplated that some 20 national factories would be retained under state control in addition to the Royal Factories. These factories were intended to form a nucleus for the production of munitions which could be readily expanded if need arose, and in selecting them the principle followed was that at least one manufacturing unit should be retained for every type of munitions with which a modern army is equipped. It was not intended that all the factories should continue to produce armaments in peace time, but merely that their capacity should be maintained intact and a nucleus staff retained capable of restarting munitions production if required.

In January, 1919, a memorandum dealing with the future of the national factories on the lines laid down by the Committee on Demobilisation and Reconstruction, was submitted to the War Cabinet and approved. It was proposed that the " Class A " factories marked for retention should where possible be leased for other purposes than munitions production, on the understanding that the plant and machinery should either be stored in the factory and kept in a serviceable condition or maintained *in situ* and used in such a manner as to be readily reconvertible. The factories proposed for retention were as follows :—

For explosives production, H.M. Factories, Gretna (cordite) ; Irvine (nitro-cellulose powder) ; Queensferry (T.N.T., tetryl and guncotton) ; Swindon (ammonium nitrate).

For poison gas, H.M. Factories, Ellesmere Port, Sutton Oak and Avonmouth.

For filling, National Filling Factories, Hereford (shell) ; Gloucester (cartridge cases) ; Perivale (fuses).

For machine-guns, National Machine-gun Factory, Burton-on-Trent.

For guns, National Ordnance Factory, Nottingham.

---

[1] Sec/Gen/2661. [2] Sec/Gen/592.
[3] HIST. REC./R/1000/61 ; HIST. REC./R./1122/20.

For optical munitions, National Optical Munitions Factory, Kentish Town.

For shell, National Projectile Factories, Cardonald and Lancaster.

For small arms ammunition, Government Cartridge Factory No. 3, Blackpole.

It was also thought that one factory would have to be retained for experimental purposes in connection with anti-gas apparatus.

Closely connected with this programme was a scheme for the retention of what was known as pivotal plant. Shortly after the Armistice arrangements were made for retaining a limited number of machines required for special purposes which it was thought would not be easily obtainable in the event of another war. The rest of the plant was to be disposed of, with the exception of that required for Woolwich Arsenal.[1] In the early part of 1919 this policy was changed, and the plan adopted of retaining plant sufficient for the manufacture of certain specified programmes in guns, gun ammunition, etc., these programmes being subject to reconsideration after the Peace Conference had reported. This scheme involved the retention of a large amount of plant and gave rise to many difficulties with regard to the cost of removal to store, storage and maintenance expenses, besides holding up plant of value for industrial purposes and impairing the disposal value of factory plant by withholding from sale some of the best units. In August, 1919, it was suggested that the original policy should be reverted to, and that only a limited number of quite special machines should be retained. It was believed that the situation arising from the outbreak of another war could be more effectively dealt with by having some kind of Munitions Mobilisation Scheme embodying a considered munitions programme and definite earmarking of specific factories to carry out the programme.[2] This was agreed to by the Army Council and the plant thus retained included only shell and gun plant, and was special munition-making machinery of no commercial utility. Cartridge case plant was retained at the Birtley factory, which was treated as a pivotal factory, and machine-gun plant at Burton-on-Trent until it was decided to dispose of that factory. Machines were also stored at the National Projectile Factory, Lancaster. The retention of general purposes machinery was held to be unnecessary provided statistical information was obtained and kept up to date as to the quantity of machinery in engineering works, which could be requisitioned in an emergency.[3]

As time went on considerable modifications were also made in the list of factories for retention. The view that it was unnecessary to retain capacity for munitions on such a large scale gained ground, and the original list of factories was much reduced. No final decision had been reached as to the factories which should be permanently retained, when in March, 1920, it was decided that the Class A Factories should be handed over to the War Office with the Royal Ordnance Factories. The principal changes made by that date in the original proposals may be briefly reviewed.

---

[1] Co-ordinating Committee Minutes (10.12.18).

[2] Hist. Rec./R/1760/9.

[3] Hist. Rec./R/1760/10.

In February, 1919, the Minister of Munitions urged that it was indefensible to retain so many factories with latent industrial capacity in a state of inactivity and that the majority of the factories should be sold or leased at once to firms of good standing on conditions providing for their reconversion to munitions work should need arise. Three factories only, the Burton Machine-gun Factory, Blackpole Factory for small arms ammunition, and a respirator factory, were proposed for permanent retention under direct state control. Action on these lines was approved, but six months later, further modifications in the scheme were considered necessary, partly as a result of the decision to abandon filling at Woolwich. A few factories had actually been disposed of, the Nottingham Ordnance Factory and Cardonald Projectile Factory, for instance, having been sold on terms providing for their reinstatement if required.

It was now proposed that four explosives and one filling factory should be disposed of unconditionally and Burton and Blackpole sold subject to their reconversion if needed. Filling capacity was to be retained at Banbury, Hereford, and Perivale, and explosives capacity at Gretna, Queensferry and Sutton Oak. One engineering factory (Lancaster) and a respirator factory (Watford)[1] were also to be retained. These proposals received Cabinet approval in November, but were provisional only, it being intended that the future of the explosives factories in particular should be considered by a special committee. Pending the appointment of that committee no further action was taken, and the factories proposed for retention at the end of 1919 were in fact, with the addition of Swindon Explosives Factory,[2] those which were handed over to the War Office on 1 June, 1920,[3] in consequence of the Cabinet decision not to proceed with a Ministry of Supply.

The changes of policy with regard to these factories after the War Office became responsible for them do not fall within the scope of this history, but it may be noted here that at the beginning of 1922 very few of the factories were still under War Office control, the explosives factories at Gretna, Queensferry and Swindon, Banbury Filling Factory, and the Watford and Lancaster factories having all been declared surplus and put on the market.

The War Office also undertook the responsibility for pivotal plant retained at Birtley, Lancaster, and armament firms' works, and the supervision of those factories which had been sold subject to their reversion to munitions manufacture if required, i.e., Cardonald Projectile Factory, Nottingham National Ordnance Factory, Burton Machine-gun Factory and Blackpole Government Cartridge Factory. Special conditions requiring supervision had also been imposed in the case of H.M. Nitrogen Factory, Billingham, which had not been among the original Class A factories. This factory was begun towards the

[1] This factory, originally H.M. Explosives Factory, Watford, was handed over to the anti-gas authorities after the Armistice, and was the factory selected for retention for respirator work.

[2] The previous intention to dispose of this factory was reversed in consideration of the fact that no output could be expected from Billingham for some years (*see* below, p. 40).

[3] General Memorandum, No. 297.

end of the war, for the fixation of atmospheric nitrogen, but no great progress had been made at the time of the Armistice. Viewed as a post-war measure, certain modifications in the original scheme were considered necessary and constructional work was discontinued. Shortly afterwards negotiations were opened with Messrs. Brunner Mond for the formation of a syndicate which would take over the site and use it to produce ammonia synthetically for the manufacture of fertilisers. In April, 1920, an agreement was concluded with Messrs. Brunner Mond, as agents for Synthetic Ammonia & Nitrates, Ltd., a limited company subsequently incorporated. Messrs. Brunner Mond purchased the site, and as one of the conditions of the purchase undertook to establish as soon as possible works capable of fixing a specified amount of atmospheric nitrogen, and also to provide plant, at Billingham or elsewhere, for oxidising ammonia and producing nitric acid suitable for explosives.[1]

Mention may also be made here of a factory which was not national in the usual sense, but whose output was secured to the State in the event of future hostilities. The British Cellulose & Chemical Manufacturing Company had during the war erected a factory at Spondon, near Derby, which was the only British source of cellulose acetate,[2] and had received various advances from the Government. After the Armistice the company was in financial difficulties and to prevent their going into liquidation the Government agreed in February, 1920, to take preference shares in the company equal in value to sums previously advanced, which had been secured by debentures and mortgage, the shares so allotted being rather more than a third of the total issue. In consideration of this, the Government appointed two Directors, and were to have the right, in the event of war, to take control of the factory and use it for munitions purposes.[3]

(*d*) The Disposal of Factories

It has been seen that the second of the four classes into which the Committee on Demobilisation and Reconstruction divided the national factories contained about 85 establishments considered suitable for industrial use. The future of these factories gave rise to considerable discussion after the Armistice. Labour representatives were anxious that some at least should be retained under state control for the manufacture of commercial articles, in order to relieve unemployment. In January, 1919, however, the Cabinet decided that there should be no manufacture by the State in competition with industry, and a suggestion that certain factories might be used to make articles for government use only was also, after full investigation, found to be impracticable. It was therefore decided that only factories for the manufacture of armaments should be retained by the State.[4] This meant that there were

[1] Sec/Gen/1484A, 2258.
[2] *See* Vol. XII, Part I, p. 140.
[3] M.F./Gen/1964.
[4] The nearest approach to State trading after the war was the repair of mechanical transport vehicles carried on at the Slough Depot. For an account of this, and for a fuller discussion of the question of using national factories for industrial purposes, *see* Vol. VII, Part I, Chapter V.

over 200 establishments which must ultimately pass out of the hands of the Government. A certain proportion of these, however, were held on conditions requiring their return to their original owners after the cessation of hostilities. Most of the National Shell Factories, for instance, reverted to their pre-war owners, the Boards of Management which had administered them during the war being authorised to take the necessary steps in these cases and to dispose, after reference to the Disposal Board, of plant and buildings which were Ministry property.[1]

A number of factories, though they would ultimately become surplus, were retained for a time for various purposes. A number of establishments, including some of the large filling factories, were allocated to meet the demand for storage accommodation. By the end of March, 1919, when surplus property was coming forward in increasing quantities, the question of storage had become acute and it was suggested that the policy of disposing of factories as rapidly as possible needed revision. Unless more factories were held back, the demand for storage might necessitate the erection of new buildings, which would be an expensive method of dealing with the problem.[2] In September 1919, eleven factories were temporarily in use for storage purposes, and there were also about 120 stores and depots.[3]

Factories were also required for the training of disabled soldiers, and in May, 1919, the Cabinet ruled that the provision of training facilities should have first claim on any factory suitable for the purpose, provided that if a factory were saleable and another for which there was no purchaser was reasonably suitable the latter should be utilised.[4] Some half dozen factories, and portions of one or two others had been transferred to the Ministry of Labour by the autumn of 1919 for training purposes. By that time 9 or 10 factories had also been transferred to the War Office for use as permanent base depots, as stores, or for other purposes.[5]

The Ministry of Munitions required a certain number of factories for breaking down munitions, five or six factories, other than Class A factories, being engaged on this work during 1919. Two of the National Aircraft Factories were used for the storage and salvage of aircraft, while Leeds Ordnance Factory received an order for new 18-pdr. guns required by the War Office.[6]

Another factory which was in use for some months after the Armistice was the Government Rolling Mills at Southampton. This factory was erected in 1916 for rolling brass and cupro-nickel strip and in selecting the site consideration was given to the possibility of the factory competing with Germany for export trade after the war. After the Armistice it was used for smelting non-ferrous scrap. Its retention as a National Small Arms Factory was suggested and other

---

[1] C.C. 25 and 154 ; D.B. 31 (Copies in HIST. REC./H/1122/20).
[2] C.C. 128, in HIST. REC./R/1125/9.
[3] (Printed) *Weekly Report*, No. 209, I. (6.9.19).
[4] Co-ordinating Committee Minutes (22.7.19).
[5] (Printed) *Weekly Report*, No. 209, I. (6.9.19).
[6] *Ibid.*

proposals put forward at various times were that it should be transferred to the Admiralty as a store or used for the manufacture of telephone and telegraph wire.[1] Early in 1919, however, it was decided that it should be put up for disposal as a unit.[2]

As soon as a factory was declared surplus, the policy adopted was to dispose of it as rapidly as possible in order to assist in the restoration of normal industrial conditions. Before a factory could be sold, however, there were certain preliminary measures to be taken which sometimes caused delay, apart from any question of finding a purchaser. Legal questions frequently arose relating to the tenure of land, which in many cases had been taken under the Defence of the Realm Act, to railway sidings, rights of way, and so on. In many cases the land had to be acquired before sale could be effected, and where possible this was done by agreement with the owner.[3] Before sale, also, the accounts of a factory had to be closed, and in some cases material or machinery had to be removed.[4]

In order to assist the rapid disposal of factories a committee was appointed in March 1920 to consider what steps could be taken to expedite the release or disposal of factories, while providing temporary storage accommodation in the most economical way, to secure the early discharge of redundant staff, and generally to reduce the cost of maintaining surplus factories pending final disposal.[5]

In addition to the national factories proper, a large number of buildings had been erected at government expense as extensions to contractors' works which remained government property after the Armistice. The disposal of these roused special problems, both because the agreements with contractors were often extremely complex, and because the owners of sites were the only possible purchasers of assets *in situ*.

---

[1] Vol. XI, Part VI.

[2] It had not been sold at the end of 1921.

[3] HIST. REC./R/1020/6.

[4] Delay in finding a purchaser also occurred where a factory was to be sold as a going concern. For instance, continual attempts were made to dispose of the works of the Hoffman Manufacturing Company, ball bearing manufacturers, whose business had been purchased by the Government in 1917, but no purchaser had been found at the beginning of 1922 (C.R.V./Gen/0364 ; Sec/Gen/1693).

[5] Minutes of Co-ordinating Committee (12.3.20).

APPENDIX

APPENDIX.

Organisation of the Ministry of Munitions for Disposal and Liquidation.

(*a*) Organisation for Disposal of Surplus Government Property. (*General Memorandum No.* 167.)

In accordance with the decision of the Government to establish a central authority for the disposal of all surplus Government property, the Minister of Munitions, in February, 1919, approved of the following organisation for this purpose.

An Advisory Council was appointed to advise the Minister on such questions of policy as might be referred to them. The Council was constituted as follows :—

The Most Hon. the Marquess of Salisbury, K.G., G.C.V.O. (*Chairman*).
The Rt. Hon. Lord Inchcape.
The Rt. Hon. Lord Colwyn.
Sir Howard Spicer, K.B.E.
Mr. W. L. Hichens.
Sir John Ferguson, K.B.E.
Mr. F. Dudley Docker, C.B.
Sir Lindsley Byron Peters, K.B.E.
Sir Peter McClelland, K.B.E.

A Board directly responsible to the Minister, called the Surplus Government Property Disposal Board, was also appointed, consisting of :—

Mr. F. G. Kellaway, M.P., Deputy Minister (*Chairman*).
Sir Howard Frank, K.C.B. (*Deputy-Chairman*).
Lieut.-Gen. Sir Travers Clarke, K.C.M.G., C.B.
Sir Robert L. Connell, K.B.E.
Maj-Gen. Sir A. R. Crofton-Atkins, K.C.B., C.M.G.
Mr. David Currie.
Sir Philip Henriques, K.B.E. (*Financial Adviser*).
Mr. Alex. Walker.
Secretary : Major F. C. T. Tudsbery, O.B.E., LL.M.

The departmental organisation to deal with the different classes of property arising for disposal was divided into the following Groups and Sections, each Group being under the general superintendence of a member of the Disposal Board, and each Section under the head of a Controller responsible to the member of the Disposal Board in charge of his Group :—

	Section.	*Controller.*
Group D.B. 1	D.B. 1a.—Lands, Buildings, Factories.	Mr. E. H. Coles.
	D.B. 1b.—Timber ..	Sir James Ball.
Sir Howard Frank, K.C.B.	D.B. 1c.—Huts, Building Material.	Col. H. C. Cole. C.B.E.
	D.B. 1d.—Furniture ..	Mr. J. Hooper (*Deputy Controller*)
	D.B. 1e.—Plant, Machinery.	Mr. C. L. Morgan, C.B.E.
Group D.B. 2	D.B. 2a.—Mechanical Transport.	Lt.-Col. C. V. Holbrook.
	D.B. 2b.—Horses and Animals.	Col. Sir Herbert Jessell, Bart., C.M.G.
Maj.-Gen. Sir A. Crofton Atkins.	D.B. 2c.—Railway Material.	Col. Kittoe (*Acting*).
	D.B. 2d.—Watercraft and Barges.	
Group D.B. 3	D.B. 3a.—Electric Instruments, Telephones.	Lt.-Col. C. H. H. W. Francis.
Sir R. Connell	D.B. 3b.—Textiles, Leather Equipment.	Mr. T. B. Barker.
	D.B. 3c.—Medical Stores..	Mr. Woolcock, M.P., O.B.E.

	Section.	*Controller.*
Group D.B. 4	D.B. 4A.—Ferrous Metals..	Mr. B. Walmsley.
	D.B. 4B.—Non - Ferrous Metals.	Mr. R. W. Rucker.
Mr. Alex. Walker ..	D.B. 4C.—Chemicals and Explosives.	Mr. D. J. Duff.
	D.B. 4D.—Liaison with Central Stores Dept.	
Group D.B. 5	D.B. 5A.—Factory, Consumable Stores.	Mr. J. E. Francis.
Mr. David Currie.. ..	D.B. 5B.—Aircraft Equipment.	Mr. W. Mc C. Cameron.
	D.B. 5C. — Miscellaneous Stores.	Mr. W. J. Larke, O.B.E.
Group D.B. 6	D.B. 6A. — Finance and Accounts.	Major T. Dudley Cocke.
Sir P. Henriques ..	D.B. 6B. — Colonial and Municipal Requirements.	Mr. P. Keith Lang.
	D.B. 6C.—Statistics ..	Mr. H. A. Fortington, O.B.E.
	D.B. 6D.—Transport.	
	D.B. 6E.—Relation with Export Houses.	Sir Sydney Henn. K.B.E.
	D.B. 6F.—Planning, Costings and Breaking Down.	Mr. W. H. Webbe,
Group D.B. 7	Special Supervision of Theatres of War.	
Lt.-Gen. Sir Travers Clarke.		

Secretariat, Sec. Disp.
Major F. C. T. Tudsbery (*Secretary*).
Mr. H. Claughton (*Assistant Secretary*).

In carrying out the duties entrusted to him, each Controller was provided with the assistance of a Committee of Honorary Advisers, whose special knowledge and experience would ensure that the various classes of property were disposed of to the best advantage.

(*b*) Organisation for the Ministry of Munitions (Supply). (*General Memorandum*[1] *No.* 187.)

Heads of Departmental Groups:

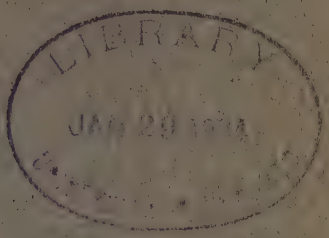
Pending the passing of the Ministry of Supply Bill the Minister has appointed the undermentioned officers to superintend Departmental Groups as specified.

Sir W. Graham Greene, K.C.B. ..	Secretary of the Ministry.
Sir Sigmund Dannreuther, C.B. ..	Accountant-General.
Directors-General:	
Mr. N. F. B. Osborn	Requirements and Statistics.
Mr. W. J. Larke, O.B.E.	Raw Materials (A).
Sir Arthur Goldfinch, K.B.E. ..	Raw Materials (B).
Brig.-General W. Alexander, C.M.G., D.S.O.	Purchases.
Sir Benjamin Johnson	Factory Administration.
Mr. Burton Chadwick, M.P.	Stores and Transport.
Mr. A. H. Collinson, C.B.E.	Inspection.
Disposal Board	(As constituted).
Major-General the Hon. Sir F. R. Bingham, K.C.M.G., C.B.	Military Inspection.

The procedure hitherto governing the relation of members of Council to the Minister and Departments under their superintendence respectively will be applicable provisionally to the Directors-General, the Accountant-General reporting to the Minister through the Financial Secretary.

[1] 13 May, 1919.

HISTORY OF THE MINISTRY OF MUNITIONS



VOLUME II

GENERAL ORGANISATION FOR MUNITIONS SUPPLY

PART II

LOCAL ORGANISATION IN THE UNITED KINGDOM

UNDER THE

DEPARTMENT OF AREA ORGANISATION

1921

VOLUME II

GENERAL ORGANISATION FOR
MUNITIONS SUPPLY

PART II

LOCAL ORGANISATION IN THE UNITED KINGDOM

UNDER THE

DEPARTMENT OF AREA ORGANISATION

CONTENTS.

AREA ORGANISATION.

(3387) Wt.8573/X3763 250 6/21 Harrow G.36

CHAPTER VIII. PAGE

The North-Western Boards (Area II).

CHAPTER IX.

The Yorkshire Group (Area III).

CHAPTER X.

The Midlands (Area IV).

CHAPTER XI.

The South-Western Boards (Areas V and VI).

CHAPTER XII.

The Metropolitan and East Coast Groups (Areas VII and VIIB).

CHAPTER XIII.

Local Administration in Scotland (Areas VIII and IX).

CHAPTER XIV.

Ireland (Areas X and XI).

APPENDICES.

AREA ORGANISATION

CHAPTER I.

INTRODUCTORY.

The beginnings of local organisation have already been traced in detail elsewhere,[1] but it may be well to summarize the stages through which the movement had passed at the time of the foundation of the Ministry of Munitions.

In October, 1914, when the need for a largely increased allowance of gun ammunition first became apparent, the War Office decided that the necessary production was not beyond the powers of the big armament firms, provided that they could be re-inforced by subsidised extensions of their works and by a wide expansion of sub-contracting. Some time necessarily elapsed before it was possible to estimate the success or failure of this decision, which influenced the general trend of War Office policy down to the spring of 1915. It was found in December, however, that the deliveries promised by the main contractors would not be up to time, and the help of the Board of Trade was invoked to counteract the shortage of skilled labour, which was among the chief drawbacks complained of by the armament firms.

One of the remedies proposed by the Board of Trade was that ordinary engineering employers should, wherever possible, surrender their skilled men to the armament factories, and a canvass of firms was instituted for this purpose by Labour Exchanges throughout the country. A general resentment was felt by employers at the suggestion that their works should be depleted of labour for the benefit of other private factories and the most important result of the canvass[2] was a demand to be allowed to tender for direct contracts.

The Board of Trade, while not abandoning the campaign for the transfer of labour, was impressed by the possibilities of spreading direct munition contracts over a wider field, and on 9 January, 1915, obtained the sanction of the Master-General of Ordnance to an agreement by which local Labour Exchanges were to inform firms in their district that the War Office would consider requests on their part for contracts. The methods which were now employed to gauge the capacity of engineering firms may here be briefly enumerated. An engineering survey of the country was compiled between January and March, 1915, based on reports of firms obtained from Labour Exchanges, under two headings, (*a*) whether the firm was now, directly or indirectly, engaged on Government work, (*b*) whether it was prepared to do such work or to increase the amount it was already doing. Exhibitions of samples of shells and fuses were also arranged at various engineering centres

[1] Vol. I, Part III.

[2] The numbers recruited at this date were negligible; 2,619 firms visited in London yielded no more than 225 men for transfer (Vol. I, Part III, p. 3).

and opened on 10 March ; manufacturers were invited to inspect them and tender for any article they thought they could make. The result of this early local campaign was that a large number of individual manufacturers offered to place their buildings, plant and personal service at the disposal of the Government.

Meanwhile, the principle of co-operative grouping had been applied to the movement for munitions manufacture by the firms themselves. It was not a new one, having already been adopted in England in the case of certain army stores, such as saddlery, while in France, private engineering firms had been banded together to produce ammunition since shortly after the outbreak of war.[1] The first British co-operative group for munitions may indeed be considered affiliated in some sort to the French model, for Mr. Dumas, of the British Thomson-Houston Company, who took the main part in its promotion, had assisted a representative of the French branch of his company in getting together machines for the manufacture of the 75 mm. shell. Mr. Dumas made the first suggestion to the Leicester Association of Engineering Employers on 8 January, 1915, and a scheme of co-operation which should embrace every process in the manufacture of certain types of shell was definitely set on foot at a meeting of the same body on 23 March. A deputation from the new group submitted their proposals to the War Office on 30 March and received their first order for a weekly output of 1,000 4·5 in. H.E. shell.

The movement spread rapidly ; representatives from Hull, Bradford, Leeds and other northern towns visited Leicester and modelled schemes on the same lines ; the President of the Associated Chambers of Commerce and the Secretary of the Engineering Employers' Association instructed their local associations to form committees among their members, so that within the next month alone more than twenty local munitions committees were formed. Towards the close of April, the Leeds group suggested setting up a National Shell Factory equipped with the machinery available in their district, which would concentrate manufacture under one roof instead of disseminating it among a considerable number of small shops. The scheme was accepted and committees had in future the choice either of working on co-operative lines or of setting up a National Shell Factory.

During this time there had been important changes at headquarters. On 31 March the Armaments Output Committee was appointed by Lord Kitchener, whose terms of reference indeed limited them to providing additional labour for munition work, but who undertook from the beginning the organisation of the reserve capacity of the engineering industry. It is not possible here to do more than outline the policy pursued by Mr. Booth, its leading member, who was joined towards the end of April by Sir Percy Girouard. At first a compromise between the War Office and the Board of Trade (who favoured the spread of

[1] In October, 1914, the Cabinet mission to France had reported on the French system of co-operative production, but the suggestion then made that it should be adopted in this country was negatived by the War Office and armament firms.

contracts among local groups) was effected by dividing the country into areas of two types, known as A and B areas. An A area was to be a district comprised within a radius of about 20 miles measured from any one of the Government factories or of the recognised armament firms on the War Office list. Area A was to be considered sacred to the armament firms and so long as they were undermanned no new contracts were to be placed within it. All other districts where engineering capacity could be found were to be B areas in which co-operative groups could be formed.[1]

Had the 20 mile radius been enforced it would have included most of the groups already being formed and the scheme must have broken down on that ground alone, but as a matter of fact the principle was abandoned within a fortnight of its adoption because of the serious experimental difficulties connected with the organisation of fresh and independent centres of shell production. The policy now adopted aimed at the co-ordination of the two types. The country was now to be divided into munitions areas based on volume of capacity and controlled by local committees. While these local areas were being organised their workmen would be sent to the Arsenal or the great armament firms to be trained and would return to form the nucleus of labour for the new units. Fixed rules for the constitution of these committees were circulated towards the close of April by the War Office, and the co-operation of Labour in the work of a committee was insisted on. Committees were also asked to nominate a small executive Board of Management from their numbers to carry out their schemes.

The changes of policy had been hitherto too rapid greatly to affect the local position. During May, however, the decision of the Armaments Output Committee to concentrate on the larger areas led to the shelving of these small groups (each capable of producing at most from 500 to 1,000 shells weekly) which had sprung up in isolated districts. This tended at first to chill the enthusiasm of localities, where committees had either been set up or were in process of formation, to whom the possibility of becoming absorbed in a larger area by no means appealed.[2] On the instructions of the Armaments Output Committee the smaller districts continued to form and maintain local committees in order to prepare themselves for any future emergency by becoming acquainted with the resources of their district in labour and machinery.

The position, briefly, on the eve of the formation of the Ministry of Munitions was that twenty-five committees had been set up in England, Scotland and Ireland, while, with very few exceptions, those subsequently set up were already far advanced in their preliminary organisation. Six Boards of Management had actually received approval from the War Office, and orders representing an output of 9,500 4·5 in. H.E.

[1] Two local Armament Committees were formed in the areas of Newcastle and Glasgow, whose purpose was almost entirely concerned with the transfer of labour and whose origin was semi-official. See below Chap. VIII and Chap. XIII.

[2] See below under Hull, p. 56.

and 33,000 18 pdr. H.E. shells weekly had been placed. A movement, promoted in the first instance artificially from headquarters, and adopted locally from a perfectly natural desire on the part of the manufacturers to defend themselves from the encroachments of the armament firms, had now been transformed into an outlet for a genuine and enthusiastic patriotism. In some groups manufacturers were purchasing lathes on their own initiative, guaranteeing expenses or offering premises rent free, so anxious were they that manufacture should begin without delay. Nor was this zeal confined to the employers; workmen were offering to do eight hours in connection with their own work and four more after on shell; as the manager of one large firm said: "Shells have been talked about so much that the British workman cannot go to bed happy at night if he is not in a factory which is turning out shell."[1]

[1] D.A.O./3/507, 518; HIST. REC./H/1121·21/3, 1121·22/4, 1121·27/1.

CHAPTER II.

THE FORMATIVE PERIOD OF AREA ORGANISATION (JUNE–AUGUST, 1915).

I. Mr. Lloyd George's Itinerary (June, 1915).

It is significant of the importance obtained by the movement that one of the earliest acts of the new Minister was to arrange for a series of personal visits to munition groups of outstanding importance. Such a tour had already, at the beginning of May, been projected for Mr. Lloyd George (then Chancellor of the Exchequer) and members of the Munitions of War Committee.

On 28 May, Mr. Lloyd George interviewed deputations of the Leicester Group and the Birmingham Committee, both already in an advanced stage of organisation. On 3 June he made his first public appearance as Minister of Munitions at Manchester, his birthplace, where he addressed a large meeting of representatives of the Lancashire engineering trades. The following day he was at Liverpool. On 11 June he attended a meeting of the South Wales Munitions Committee at Cardiff, and on 12 June appealed to both employers and workmen at a big public meeting in Colston Hall, Bristol. On 15 June he terminated the series of conferences by interviewing the Metropolitan Munitions Committee. He was accompanied by Sir Percy Girouard, who, with Mr. West, supplied the meetings with the necessary technical details.[1]

His appeal in all places followed the same general lines. He showed how France had met the crisis by organising private workshops, and what a supreme advantage she possessed in having all the engineering resources and all the labour in the country at the disposal of the State. The general tenor of his remarks with regard to compulsion was that, though he believed more could be got out of patriotism than out of any Act of Parliament, the compulsory powers of the Defence of the Realm Acts not only helped to get rid of unnecessary difficulties without delay but also had the advantage of equalising sacrifice.

Everywhere he spoke on the question of labour and the necessity for its increased mobility and greater subordination to the direction and control of the State. Speaking at Manchester, he said :—

> " The regulations, the trades customs and practices, which may be of great service and probably are of great service in times of peace are utterly inapplicable and quite out of place in the terrible urgency of war . . . . When the house is on fire, questions of procedure, of precedence, of etiquette, and time and division of labour, disappear. You cannot say that you are not liable to service at three o'clock in the morning. The fire is on. You do not choose the hour ; you cannot argue as to whose duty it is to carry the water bucket, and whose duty it is to tip it into the crackling furnace. You have to put the fire out. There

[1] Hist. Rec./H./1121·22/1,6 ; 1121·24/3,6 ; 1121·26/1 ; 1121·27/1 ; Hist. Rec./R/1121·25/3.

is only one way to do that, and that is, everything must disappear but duty, good fellowship, comradeship and determination to put the whole of your strength into the winning of victory for your native land and for the liberties of the world."[1]

At Liverpool, too, he emphasised the necessity of trade unions relaxing rules and trusting the pledged word of the Government that they should return after the war to the *status quo*.

At all meetings he urged that no time should be lost in setting up committees, and as far as possible districts should co-ordinate their efforts so as to form one organisation rather than several.

The enthusiasm which Mr. Lloyd George aroused was universal and is well exemplified by the general response to his appeal regarding the labour question. Both at Manchester and Liverpool the representatives of the Amalgamated Society of Engineers promised their unequivocal support to any relaxation of trade union rules; at Bristol, both employers and workmen joined in a resolution to do all in their power to meet the urgent need for munitions. The Metropolitan Munitions Committee did not include labour representatives, but there was a general feeling among its members that the loyalty of the trade unions could be relied on.

The result of Mr. Lloyd George's appeal was greatly to accelerate local organisation in those districts visited. Within less than a week of his tour, Liverpool and Manchester had settled the much vexed question of division into suitable groups; South Wales, where the problem of grouping was even more complicated, had been equally expeditious; the West of England had decided on a form of organisation; while the Metropolitan Munitions Committee had received official approval of its constitution.

Organising activity was indeed general during the first part of June. Deputations from local committees called daily at the new Ministry; a copious correspondence poured in offering services or asking for information relating to requirements, specifications, contracts, labour, etc.; visits had to be arranged to Woolwich or Sheffield. Delay and confusion were bound to arise and it soon became apparent that the branch of the Ministry dealing with local matters would have to be strengthened.

II. The Scheme of Area Organisation.

Early in June, Mr. (later Sir James) Stevenson, who had joined Mr. Booth's "Districts Department" almost immediately after the formation of the new Ministry and had taken up work in connection with the organisation of local committees,[2] initiated a scheme of decentralisation which, by dealing with the many technical and miscellaneous matters which arose locally, would relieve the pressure at headquarters. On 15 June, the matter was discussed by him at a conference, when Lord Elphinstone, Captain Creed and Captain Kelly were present, and a preliminary plan of organisation into Areas was drafted.[3]

[1] Hist. Rec./H/1121·22/6. [2] See below Chap. III.

[3] Hist. Rec./H./1121/4. On 17 June, Mr. Stevenson asked Captain Creed to visit Manchester to make enquiries for suitable offices there and to secure, if possible, a suitable person to act as Area Organiser to the North-Western Area (D.A.O./2/1000a).

A departmental conference with the Minister took place on 18 June, and the scheme was set out in detail in a letter from Mr. Stevenson to Mr. Lloyd George, dated 20 June, 1915.

Under this scheme it was proposed that the United Kingdom should be divided into ten Areas, the limits of which were (with a few exceptions) to follow county boundaries. In each of these Areas it was proposed that an Area Office should be established.

> "In justification of the establishment of local Area Offices," wrote Mr. Stevenson, "it may be proper to remark that this principle is adopted by every large commercial undertaking. It is found that the local office is better able than a central one to gauge local feeling and minister thereto, in addition to which a healthful competition is engendered between the branch offices in showing good administrative results . . . . The primary duty of the suggested Area Offices would naturally be to relieve the pressure at headquarters. They would be better fitted than the chief office to secure local information and to dispose of sectional difficulties. Being in direct telephonic communication with the works and in close contact with the personnel of the various Committees in their own areas, they could, without delay, settle many questions of minor importance. This may appear but a small advantage at the outset, but details of seemingly slight significance are apt to develop into serious complaints if not disposed of promptly and satisfactorily."[1]

The proposed Areas and Offices were as follows[2] :—

Areas.	District Embraced.	Proposed Office.
1	Northumberland, Durham, East Coast of Yorkshire, Grimsby.	Newcastle.
2	Cumberland, Westmorland, Lancashire, Cheshire, North Staffordshire (including Stone), Anglesey, Carnarvon, Denbigh, Flintshire, Merionethshire, Montgomery.	Manchester.
3	Yorkshire (excluding East Coast)	Leeds.
4	Derby, Nottingham, Lincoln, South Staffordshire, Leicester, Worcester, Warwick, Oxford, Northampton, Rutland.	Birmingham.
5	Pembroke, Cardigan, Radnor, Brecknock, Carmarthen, Glamorgan, Monmouth, Hereford.	Newport, Cardiff or Bristol.
6	Gloucester, Wiltshire, Dorset, Somerset, Devon, Cornwall.	
7	London, Middlesex, Hertfordshire, Buckingham, Bedford, Cambridge, Huntingdon, Berkshire, Hampshire, Surrey, Kent, Sussex, Norfolk, Suffolk, Essex.	London.
8	East Scotland	Glasgow.
9	West Scotland	
10	Ireland	—

[1] Copy of letter of 21 June, 1915, filed in HIST. REC./H./1121/2.
[2] Very slight changes were made in this original scheme. See Appendix I.

Under the scheme, the Area Office was to be staffed by two permanent officials, whose appointment was considered by Mr. Stevenson to be of the utmost importance, the Organising Secretary and the Chief Engineer. In addition it was suggested that the following public Departments or services should be represented within the office—the Admiralty, War Office, Home Office, Board of Trade, Head Inspectors' Department, Sub-districts Department, Clearing House for Labour, Clearing House for Work, the Publicity Department and the Accounts Department.

The scheme received the Minister's general approval, conveyed in a letter to Sir Percy Girouard on 1 July, but already in his speech of 23 June, introducing the Munitions of War Bill, Mr. Lloyd George described the new organisation as part of an established policy.

> "No staff, however able," he said, "could adequately cope from the centre with the gigantic and novel character of the operations which must be put through during the next few weeks, if the country is to be saved. We have, therefore, decided to organise the country in districts . . . . . I am relying very considerably upon the decentralisation which I have outlined. There is no time to organise a central department which would be sufficiently strong and which would be sufficiently well equipped to make the most of the resources of each district . . . . . There is only one way of organising the resources of the country efficiently within the time at our disposal. That is that each district should undertake to do the work for itself, and that we should place at their disposal everything that a Government can in the way of expert advice and in the way of material."[1]

The establishment of Area Offices rendered reorganisation and expansion of the "Districts Department" necessary. Mr. Stevenson, as organiser of Area Offices and local committees, now undertook the general charge of the branch, and a certain number of Controllers (in the first instance three, Lord Elphinstone, Mr. Ridpath and Mr. McLaren) were appointed to look after matters relating to the Areas at headquarters.[2]

III. Mr. Lloyd George's Conferences with Boards of Management and Area Engineers (August, 1915).

By the close of July, details of the new scheme had been fully worked out, offices had been established in the various Areas, the duties of the new officials had been defined and in some cases they had entered upon their new duties. The time had now come to make the administrative policy of the Ministry clear to the Boards, who had hitherto had a very free hand in the organisation of their districts. The main function of the Armaments Output Committee had been to set these local bodies going, to accept their offers, to arrange their contracts with

[1] *Parliamentary Debates*, 1915 (H. of C.), LXXII, 1191.
[2] HIST. REC./R./263·34/2.

the War Office, and to help them over their difficulties with machinery, labour and raw materials. Otherwise the Boards of Management saw themselves enjoying a fairly complete measure of autonomy, and this sense of freedom and responsibility had counted for much in the enthusiasm with which they originally threw themselves into the work. Already there were signs that they were disposed to resent the interposition of the Area Office between themselves and the Ministry as the superfluous intrusion of a new set of officials whose advice and authority were equally unwelcome. There were also indications that hitherto the achievement of the Boards as a whole had not fulfilled their early promise, and in August, the Minister arranged for a series of conferences with individual Boards and with Superintending Engineers with the object of eliciting a free statement of difficulties and of clearing up doubts as to the duties and powers of Boards and their relation to the Ministry, to the Area Offices and to the firms in their districts.[1]

As a preliminary to these conferences, a circular was sent to Boards and local committees at the beginning of August. It adumbrated very clearly the procedure with which all the districts were henceforward to be brought into line and may here be summarised.[2] A list of the Area Offices established, of the districts assigned to each office and of the officials to be located at each branch office was first given. A brief statement was attached indicating the duties of the permanent officials (1) the Area Engineer (2) the Secretary and (3) the Labour Officer.

(1) The primary duty of the Area Engineer was " to develop the resources of the Area as fully as possible along the lines laid down from time to time by the Minister of Munitions." He was to ascertain details of and report on available machinery, he was to inspect National Shell Factories, advise on the capabilities of firms and report on the progress of contracts.

(2) The Area Secretary was to superintend office routine, keep records and be responsible for office expenditure. He was to keep in close touch with and render all possible assistance to the secretaries of the various Munitions Committees and Boards of Management.

(3) The duties of the Labour Officer as set out in the circular were rather those of an Intelligence Officer than executive in character. He was to act in co-operation with the Area Engineer and Secretary and in consultation with the Labour Advisory Boards, and was to report to headquarters on such matters as related to war munitions volunteers, badging, wages, etc., under the Treasury Agreement and the Munitions of War Act.

---

[1] Hist. Rec./H./1121/2. Mr. Lloyd George, speaking to the Manchester Board, said : "After some weeks experience and observation of what has been going on, although a good deal of work has been done, I am frankly a little disappointed that more could not be accomplished and I want to find out exactly what is wrong . . . If they are difficulties we can smooth up here, very well, we must set ourselves to putting the matter right. If, on the other hand, the difficulties are down there, I should like to know exactly what they are."

[2] Hist. Rec./R./1121/25.

A distinct line was now to be drawn between the management and labour functions of local Munitions Committees. For executive purposes a small Board of Management, drawn from the employers' side of the committee, was to be elected,[1] which would be in direct touch with the Area Officials dealing with the technical side. The labour representatives of the committees were on their side to appoint from their number a Labour Advisory Board which was to work under the National Advisory Committee, independently of the Board of Management but in close touch with the Labour Officer. The local committees themselves were to remain as consultative bodies.

On 10 August, Mr. Lloyd George began a succession of conferences with individual Boards of Management. The Ministry was also represented by Dr. Addison, Major-General Philipps, Sir Frederick Black, Mr. Stevenson, Mr. Fowler, Mr. West and Mr. Hanson. The local organisations conferred with were the East Anglian Munitions Committee, the Boards of Management for Manchester, Blackburn, Liverpool, Leeds, Cardiff, Ebbw Vale, Swansea, Uskside, West of England, Birmingham and the Metropolitan Munitions Committee.[2]

At these meetings the Boards, as admonished by Mr. Lloyd George, declared their grievances with no uncertain voice. There was a general request for local autonomy, Birmingham and the Metropolitan Munition Committee being the most insistent in their claims. The Chairman of the former Board claimed absolute freedom of action as far as the munitions which they had undertaken to produce were concerned, with the Superintending Engineer of the Area acting under their direction and control.[3] Mr. Hall Blyth, of the Metropolitan Munitions Committee, developing the same theme, said: "We are not going to sit down in an office in London and be clerks either to the War Office or the Munitions Department."[4] Both the East Anglian and the West of England Committees thought that all correspondence with manufacturers should go through their Boards.

The most important of the particular questions raised at these conferences was the nature and extent of the Boards' responsibilities in regard to the placing of contracts. The solution generally favoured by the Boards was that all dealings with firms in their respective districts should pass through their hands. They argued that their knowledge of local resources would prevent the confusion and overlapping bound to occur if the firms tendered directly to the Ministry or the Ministry through its Area Offices issued lists and requirements to firms or affiliated committees without their knowledge.

Complaints as to the difficulty of obtaining orders and variations in the statement of requirements were made in certain districts. Thus, the Manchester representatives said that when Sir Percy Girouard had

---

[1] This, of course, had already been done in the majority of cases.

[2] HIST. REC./H./1121/2. With the addition of Leeds and the East Anglian Munitions Committee, these were representatives of the local groups seen by Mr. Lloyd George in June.

[3] HIST. REC./H./1121·24/6.

[4] HIST. REC./H./1121·27/1.

visited Manchester they had been told to make 18 pdrs., 4·5 in. and 6 in. shell. They had offered 20,000 a week. They had then been informed that only 18 pdrs. were wanted and had received an order verbally for 28,000, and had infinite difficulty in getting these orders confirmed.[1] There were also almost universal complaints from Boards against the Trench Warfare Department that tenders for grenades had been urgently invited by the department in July, but when sent in, committees were informed that no more orders were to be placed.[2] It was also urged that specifications for shell might be very greatly simplified, but shell-making was still treated as "a black art" by the Arsenal and the armament firms. Difficulties arising from lack of inspection and gauges were practically universal.

The question of permission to enter works, inspect machinery and, if necessary, commandeer it, was mooted, but the Boards on the whole had had no difficulty in securing available plant.

Labour matters occupied an important place in the discussion. Manchester complained of the working of the war munitions volunteer scheme in their district, and there was a certain amount of feeling evidenced that badging should be entrusted to the Boards, and also that the Labour Officer, equally with the Superintending Engineer, should work under them. Dilution of labour, then very much to the fore, was discussed at every conference and the Boards generally did not anticipate much trouble.[3]

In order to obtain a comprehensive view of the question, Mr. Lloyd George next interviewed the Superintending Engineers of the Area Offices. He discussed their duties and powers in relation to (*a*) Boards of Management and (*b*) their colleagues in the Area Offices. Their experience of Boards was in most cases still immature, but they generally corroborated the impression left by the Boards themselves that the latter were inclined to look on any assistance from the Area Offices as interference.[4] The greater part of the discussion was taken up in seeking to define the position of the various Area Officials to one another.[5]

IV. "Decisions for the Guidance of Boards of Management."

It has been seen that at these conferences the same points recurred repeatedly with different Boards. They fell into clearly defined groups, and a memorandum dealing with them was drawn up by the department

---

[1] HIST. REC./H./1121/2.

[2] On this question Mr. Roger minuted: "As far as Mills Grenades were concerned, I think it is a fact that these tenders were called for before the Munitions Committees were in full swing, and by the time the Committees had actually produced tenders the whole of the contracts had been placed." (HIST. REC./H./1121·22/6, p. 21).

[3] The majority of the Boards were still at the theoretic stage, however; Leeds anticipated a strike if any attempt were made to introduce unskilled men.

[4] Minutes of Conference with Superintending Engineers filed in HIST. REC./R./1121/35. The Manchester Engineer, speaking of the Boards in his area, said: "They were fierce to me." The London Engineer said the Metropolitan Munitions Committee would not recognise him, while the Birmingham Engineer said the Birmingham Board in particular was unwilling to avail itself of his help.

[5] See below, p. 21.

and presented to the last of the conferences held on 17 August, 1917, and composed of representatives from all the twenty-eight Boards at that date in existence.[1]

This memorandum was afterwards printed and circulated among all the Boards on 26 August as " Decisions for the Guidance of Boards of Management."

Those of the decisions which affected the history of Boards as a whole may be grouped under the heads of (1) administration, (2) contracts, (3) general powers of the Boards with regard to (*a*) labour, (*b*) machinery.[2]

(1) For administrative purposes the Boards were empowered to act as trustees on behalf of the Minister of Munitions, to sign temporary leases, to enter into contracts on such general lines and conditions as might be agreed from time to time with the Ministry of Munitions to meet the exigencies of war, and to authorise reasonable expenses for clerical and technical assistance, travelling, etc. They were to continue to have direct communication with the various branches of the Ministry, dealing with labour, supply and finance respectively.

There was to be no subordination of the Area Offices to the Boards (which would have effectually defeated the chief purpose of decentralisation), but " mutual co-operation and free interchange of information " were to be maintained, particularly with the Superintending Engineers.

No member of a Board received payment for his services, but, where desired, travelling and out-of-pocket expenses would be paid to the Boards by the Ministry.

(2) As regarded the claims made by Boards that all dealings with firms in their respective districts should pass through their hands, the Ministry remained firm in reserving its right to deal directly with firms in any Area. Their decision, embodying certain concessions, ran as follows :—

> " The Ministry is very desirous of availing itself to the fullest extent practicable of the experience of the Boards of Management. It is understood that firms with which the Ministry or the War Office had already contracted will continue to be dealt with direct. Apart from these firms, the Ministry will, as a rule, only deal through Boards of Management, but there will necessarily be some exceptions to this rule. In the case of such exceptions, the information will be furnished to Boards of Management, so far as the public interest permits. The arrangement must depend to some extent upon the facilities possessed by Boards of Management in particular districts."

---

[1] HIST. REC./R./1121/16. The memorandum was received with general approval.

[2] HIST. REC./R./1121/34. Decisions relating to the lack of gauges and difficulties of inspection and specification were also made. These difficulties were, however, general rather than peculiar to Boards. For details see Vol. VIII, Part III, Chap. I, ; Vol. IX, Part II.

Boards of Management were to be free to make contracts without confirmation, provided that (*a*) the articles contracted for were on the Ministry's list of requirements, (*b*) the prices were within the maximum price indicated by the Ministry,[1] (*c*) deliveries should be arranged for the earliest possible date.[2]

Advances to contractors prior to the carrying out of the firing test might be made up to 80 per cent. For payment of the balance in special circumstances, ministerial approval would be required. Sub-contractors using forgings or materials supplied by the Ministry might be paid in full as soon as the work had passed inspection. Defective material supplied by the Ministry would be replaced.

In all cases the arrangements made and copies of the contract were to be forwarded at once to the Director-General of Munitions Supply.

(3) With regard to labour, the decisions were generally commendatory in character. The most economical use of skilled labour was recommended and any surplus that could be set free should be reported to the local Area Office for diversion to other districts. The rate of pay for semi-skilled labour was to be determined by the rate paid in the nearest district where shell-making was a regular industry before the war, subject to adjustment to the relative rates for skilled labour prevailing in the district; reference should be made direct to the Ministry in case of doubt.

It was definitely stated that the Boards could have no final voice in the distribution of war badges, though great weight would be attached to applications examined and recommended by them.

The power of the Boards in regard to machinery was defined. Compulsory powers under the Munitions Act and the Defence of the Realm Act could only be exercised by the Minister. A Board could, however, bring to the notice of the Ministry all cases in which they considered that compulsion should be exercised in order to increase the output of munitions, in every case acting in close co-operation with the Superintending Engineer.

These " Decisions " were subject in process of time to development and extension. They mark, however, a distinct stage in the development of Boards and may be considered as their early Charter of Liberties.

---

[1] If special circumstances necessitated exceeding these prices, the Board must discuss the matter with the Ministry before placing the contract.

[2] As time was the essence of the contract the Board of Management was free to refuse to take any supplies delivered after the contract date.

CHAPTER III.

THE DEPARTMENT OF AREA ORGANISATION.

I. The Institution of the Department.

Already at the end of May a branch of the Armaments Output Committee, under the charge of Lord Elphinstone, had been established for the "Organisation of National Manufacture" and dealt with local committees. When the Ministry took shape in June, 1915, it became a "Districts Department" (known as B.M. 1) in Mr. Booth's section. Early in June, Mr. James Stevenson, who was to take the leading part in local organisation, joined this department.

The adoption of the scheme of Area Organisation as above described rendered necessary reconstruction and development of the Districts Department; three Controllers (Lord Elphinstone, Mr. Ridpath and Mr. McLaren) were now appointed at the central office to take charge of the Areas, while Mr. Stevenson undertook the general duty of organising and was formally appointed head of the branch.[1]

A further development took place in August, on the appointment of a Director, when Area Organisation ceased to be a section of Mr. Booth's department and became an independent department, known in future as the Department of Area Organisation.[2] Under the terms of his appointment, the first Director, Mr. Stevenson, had right of access to the Minister, and reported generally to the Director-General of Munition Supply, at the same time keeping in close touch with Deputy Directors. The work of the ten Areas was at this time divided among six officers of the department.[3]

The constitution of the central department thus set up suffered very little further alteration; such changes as were made were rather the natural development of the administrative machinery than any modification of the constitution. As the work expanded the number of Controllers for the Areas increased, and, as will be seen, Directors were appointed for Scotland and Ireland respectively. When in 1917 administration by "groups" was adopted for the whole office, the Department of Area Organisation fell into group "O," for which Sir James Stevenson was the representative member on the Munitions Council. He retained the title of Director of Area Organisation for some time, but the work of the department was directed by

---

[1] Copy of Mr. Lloyd George's letter, of 1 July, 1915, filed in HIST. REC./H./1121/2.

[2] Office Notice No. 2, dated 24 August, 1915 (HIST. REC./R./263·041/14).

[3] D.A.O./Misc./514; HIST. REC./R./263·34/2. Mr. Lloyd George's letter of appointment was dated 17 September, 1915.

Mr. McLaren, as Deputy Director of Area Organisation. At a later date Mr. McLaren became Director of Area Organisation and continued as such until and for some time after the Armistice.

II. The Department as a Secretariat.

In his letter to Mr. Lloyd George, of 21 June, Mr. Stevenson clearly stated his intention that the proposed department should act as a Secretariat.

> "I consider that it is very essential," he wrote, "that the Organiser and Deputy Organiser of the Area Offices should be kept *au fait* with all that transpires in the Divisional Sections, and that they should, in addition to keeping in touch with the organising Secretaries of the Area Offices by personal visitation and correspondence, attend all conferences which may be arranged by the divisional Comptrollers with the Committees at the chief office, so that through them may flow to the other Departments and to the Director-General such information regarding the whole situation as it may be deemed necessary to offer from time to time."

This principle was accepted by the Ministry, as appears from the official delimitations, given on 24 August, of the functions of the new Area Organisation Department. The primary duty of the department was then declared to be to deal with all correspondence in connection with (*a*) general committees, (*b*) Boards of Management, (*c*) Area Offices. If a matter were dealt with by the technical department, any outgoing letter was to be referred to the controller of the Area concerned for his information. Circulars and general instructions were only to be issued by the Director of Area Organisation, who in important cases would obtain the concurrence of Deputy Director-General (A) and the Director-General of Munitions Supply.

But while accepted in theory, the practice was at first imperfect. Already in September, 1915, when accepting the title of Director of Area Organisation, Mr. Stevenson pointed out that no efficient control of the Area Offices rested with his department; the various officials reported to their own departments, and though the Area Secretary took his instructions from the Department of Area Organisation, he was primarily engaged in the routine supervision of the office and the work entailed by the Finance Department. In the same way it was assumed that, once a Board of Management had been created, it passed entirely to the control of the technical department to deal with contracts.

A memorandum, dated 22 October, 1915, by Mr. Stevenson to the Director-General of Munitions Supply summarised the need of a definite procedure by which his department accepted certain responsibilities with regard (*a*) to Area Offices, (*b*) to Boards of Management.

(*a*) In order to co-ordinate the work (i) all Area Officials responsible to the Director-General of Munitions Supply should correspond solely with the Director of Area Organisation; (ii) all reports from Area Officials should come to his department, which would be responsible for their digest and circulation, and for the transmittence of decisions or replies to the Area Offices.

(*b*) With regard to Boards of Management, the Director of Area Organisation recognised that certain routine correspondence (*e.g.*, concerning raw materials) could now be direct between the Board of Management and the department concerned, but the general rule that Boards should only correspond with the Director of Area Organisation must be maintained. The close personal touch with Boards of Management which Area Controllers had obtained in the early stages was still a very important factor, and it was essential that all conferences to deal with complaints and difficulties should be arranged by the Director of Area Organisation. The department should also keep in touch with the output and progress of Boards of Management.[1]

A more systematic interchange of information was in consequence established. This is well exemplified by the series of D.A.O. circulars which were issued to Boards and Area Offices between 1915 and 1918, and which were concerned with every variety of subject ranging between questions involving important changes of policy and instructions on such matters as the greasing of plugs or the supply of grummets. They were mainly issued for information only, the Boards, where necessary, corresponding in most cases with the department concerned.[2]

Other reasons combined to improve the liaison between the Director of Area Organisation and other departments of the Ministry. Towards the close of 1915 the cost returns at National Shell Factories began to come in and showed a startling discrepancy at the various factories and examination of details led to a general agreement that matters could be improved by further centralisation of purchase, but above all by a centralised supervision of the management of factories.[3] It was obvious that the Director of Area Organisation, in view of his special responsibility to Boards of Management, should play a prominent part in the development of co-ordinating control by the Ministry, and it was therefore decided in May, 1916, to form an executive committee of which he was to be Chairman, and including representatives of the Finance, Contract, Supply and Labour Departments of the Ministry. Under the terms of its appointment the D.A.O. Executive Committee, as it was called, controlled the administration of the National Shell Factories and of other assisted or co-operative schemes arranged through or controlled by Boards of Management. No decision of importance was henceforward arrived at or given by any department to a Board without reference to the committee.[4]

The D.A.O. Executive Committee met weekly until the close of 1916 and its work was carried out with unqualified success.[5] In November Mr. Stevenson pointed out that a further unification of

---

[1] HIST. REC./R./263·34/2.
[2] HIST. REC./R./201, containing D.A.O. Circulars.
[3] D.A.O./Misc./238. See also below, pp. 42–44.
[4] D.A.O./Misc./238.
[5] D.A.O./Misc./418. Mr. Stevenson wrote on 7 November, 1916: "The success of the D.A.O. Executive Committee has been unqualified. This has been largely attained, in my opinion, by the fact that upon that Committee the representatives emanate from the different departments concerned . . . . and that the decisions are arrived at with the concurrence of all concerned."

the technical, organising, financial and contract arrangements could be brought about by combining his committee with that administering National Projectile Factories. In this way one executive would control the whole shell and component situation, and all danger of overlapping be averted. His suggestion resulted in the setting up in January, 1917, of a committee widely representative of all departments concerned in the supply of shell, known as the Shell and Components Manufacture Executive Committee, which included within its scope the administration of the manufacture of all shell and components not only by Boards of Management and National Projectile Factories, but also by British contractors dealing direct with the Ministry.[1]

This committee enabled the department to keep in touch with all developments of the Ministry's work though, owing to its wider scope, matters which might be regarded as affecting the internal policy only of the Boards were not brought forward for discussion to the same extent as had been done with the D.A.O. Executive Committee. With the introduction of "group" organisation the necessity for the committee disappeared, and after the beginning of September, 1917, no further meetings were held.[2] The Department of Area Organisation then fell, naturally, into group "O," responsible for the entire field of ammunition, for which group their Director became Council Member.

During 1917 the department added to its functions by undertaking on behalf of the Ministry all investigations in connection with telephone installation for munition firms, and also the provision of all local accommodation for other departments outside the headquarters office in London. The Department of Area Organisation also provided the secretary to the Committee on the Gauging of Stores and other Allied Questions.

III. The Relations between the Director of Area Organisation and Boards of Management.

It has been shown that the Director of Area Organisation acted in some sort as the mouthpiece of various departments of the Ministry in their dealings with Boards of Management, but this represented only one side of his relations to the Boards themselves. The members of Boards were nominated and approved by him in the first instance,[3] and the ultimate responsibility for their administration rested entirely on him. The result was a close personal relationship between the Boards and the Director, whose department indeed may be said to have stood *in loco parentis* to them.

During 1915 the Boards were still more or less in process of organisation, and there were incessant claims made on the Director of Area Organisation, both for advice and for decisive action with regard to local difficulties and for information concerning all manner of subjects

[1] D.A.O./Misc./418.
[2] (Printed) *Weekly Report*, No. 108, II, (8.9.17).
[3] C.R.1821.

connected with the manufacture of munitions.[1] The habit was thus formed of looking to the department as a court of appeal, and in various crises in the history of munitions manufacture which arose between 1916 and 1918 the department continued to assist the Boards.

The problems which the Department of Area Organisation was called on to face were part of the general history of the Ministry and it is not possible here to do more than enumerate outstanding examples. Shortage of material was a difficulty that recurred at frequent intervals and was a constant source of disaffection among the Boards' contractors. The department on these occasions took active steps to arrange both with the supply departments of the Ministry and with the Boards themselves, that they should obtain their fair proportion during periods of scarcity[2] and in cases of special hardship (as for example those arising from the shortage of 4·5 in. forgings in the latter half of 1916) negotiated a fixed scale of compensation for group contractors. Connected with the same question was the supply of defective material by the Ministry. This was the cause of a general complaint very early in 1915 and led to a decision by the Ministry that, where defects were proved to be either in the material or caused in forging, work done on forgings and steel should be credited to the contractor and fresh material supplied.[3] This decision was carried into effect by other branches of the Ministry, but all claims relating to defective material made by Boards on behalf of their contractors were in the first instance investigated in the Department of Area Organisation.[4]

The many variations in the munitions programme necessitated frequent negotiations between the department and Boards of Management, especially of co-operative groups.[5] This may be instanced more particularly with regard to the output of 18-pdr. H.E. shell, on which Boards' contractors and factories were very largely engaged. In June, 1916 it was decided to reduce the output of this type of shell, and a scheme was accordingly evolved by the Director of Area Organisation and the Boards acting in consultation by which the Boards' contractors were limited to 40 per cent. of their contract and wherever possible changed over to other requirements. These changes had scarcely time to operate before the need for 18-pdr. shell became once more urgent and, in November, 1916, the department by interviews and correspondence urged on Boards to arrange for the resumption of manufacture on an increased scale.[6]

---

[1] See below, Chapters VII.—XIV.

[2] The means taken by D.A.O. to regulate the general supply of materials to Boards are given below, see p. 39.

[3] This rule was subsequently applied for all gun ammunition components, except brass stampings and castings and iron castings for fuse bodies. (D.A.O./Misc./1394).

[4] See below, p. 41.

[5] The changes over of National Shell Factories did not involve personal hardships, as they were Ministry property.

[6] On 1 November, 1916, the Minister presided at a meeting of Boards of Management called by D.A.O. to consider the question of manufacture of increased quantities of 4·5-in. H.E., 18-pdr. H.E. and 18-pdr. shrapnel shell. (Printed) *Weekly Report* 66, III. (4.11.16). See also below, pp. 36–38.

Boards of Management had the right of direct access to the Director of Area Organisation in regard to their individual concerns, and from time to time when general policy was concerned they were summoned as a whole to conferences with the Minister and the Director of Area Organisation. In addition the department kept in contact with the work of the Boards by means of two committees, appointed from among themselves by the Boards. The earlier of these, the Boards of Management Representation Committee, elected in December, 1915, consisted of two representatives from each Area. It met regularly at Armament Buildings, but at longer intervals as time went on, and served as a medium for laying the interests and views of the Boards before the Ministry and also for keeping the Boards in touch with one another. This committee was too large for practical purposes and, in March, 1917, partly as a result of reports made to the Ministry that, outside gun ammunition, no adequate use was made of the services of the Boards, a small executive committee was elected from its members, which met fortnightly at Armament Buildings to confer with various departments, under the chairmanship of the Director of Area Organisation.

The new committee was known as the Board of Management Executive Committee, and was composed of the following members:—

Sir Wilfrid Stokes, K.B.E., East Anglia Board.
Sir Percy K. Stothert, K.B.E., West of England Board.
Sir T. Harris Spencer, K.B.E., Birmingham Board.
Mr. H. Mensforth, C.B.E., Manchester Board.
Mr. J. C. Davies, Swansea Board.
Mr. J. A. Keay, Leicester Board.
Mr. F. G. Goodbehere, Manchester Board.
Mr. J. Bissett, O.B.E., Manchester Board (Hon. Secretary).

At the meetings of this committee the difficulties which arose in different Areas were discussed and conclusions, which were subsequently put up for official sanction, were arrived at. All circulars for Boards of Management were submitted in draft and were not issued until the committee's views had been obtained.

The work of this committee must be regarded as peculiarly successful; for it enabled the Boards as a whole to be brought into personal touch not only with the Ministry but also with each other, and thus the institution of a general line of policy became possible. One of its earliest recommendations led to the setting up of Area Executive Committees, while the expansion of the Board's work, which was a noticeable feature from the close of 1917 onwards, must be regarded as largely due to its efficient work.[1]

IV. The Director of Area Organisation and the Central Clearing House.

As early as May, 1916, when the decreased manufacture of 18 pdr. shell left much machinery idle, the advisability of establishing a Central Bureau for distribution of information to manufacturers was discussed.

[1] HIST. REC./R./1121/47.

Both Sir Frederick Black and Mr. West then considered a fresh organisation unnecessary and the D.A.O. Executive Committee arranged to take up with the Admiralty the question of the use of 18-pdr. machinery lying idle. The matter rested there for the moment, but other and more permanent causes—the necessity of utilizing every scrap of available machinery, together with the question of skilled labour for the machine tool trade—soon rendered action necessary. In July, 1916, proposals for a small advisory Bureau were formulated by the department concerned and approved by Dr. Addison. At his suggestion a committee with the Director of Area Organisation as Chairman was set up to constitute procedure for the new Bureau.[1]

The duties of the Central Clearing House, as the Bureau came to be called, were of an advisory character, and were concerned entirely with the supply of machine tools. All demands made upon the Machine Tool Department for new machinery were henceforward referred by that department to the Central Clearing House, and no order placed without its approval. The Bureau was also empowered to trace and register idle or insufficiently productive machinery and to collect information about second-hand plant not engaged on war work.

Mr. Stevenson was responsible for the administration of the Central Clearing House, and all appointments were made with his sanction. The Director, Captain Kelly, took instructions from him and was solely answerable to him. An advisory Board, of which he was chairman, was also set up at headquarters to assist the Central Clearing House, as occasion might arise, in arriving at important decisions.[2]

---

[1] D.A.O./Misc./1052.

[2] Hist. Rec./R./1710/1. For further details of the work of the Central Clearing House see Vol. VIII, Parts III, IV.

CHAPTER IV.

THE AREA OFFICES.

I. The Development of Area Offices.

(*a*) General Trend of Development.

The original intention of Mr. Stevenson in instituting his scheme of decentralisation was that each Area Office should form an administrative unit with an officer at its head, entrusted with the responsibility of taking action within the limits of general policy determined at headquarters. His letter to the Minister of 21 June indicated the Organising Secretary as the suitable head,[1] but it was later accepted that the Superintending Engineer should take control and that the Secretary should act as his subordinate.[2] The Superintending Engineer, however, apart from the technical rather than organising character of his work, was appointed by and reported to another department from that controlling local organisation, while Labour too, the third department at this early date represented in the Area Offices, was already separated from Supply. Each of these departments showed a determination from the first to have its local officer responsible to itself, and it was therefore decided on 29 July that " each of the Area Officers should be independent within his own sphere, taking instructions only from the appropriate department of the Ministry." [3] With the exception, therefore, of Scotland and Ireland, where Directors of Munitions were appointed,[4] and in Leeds, where the Organising Secretary, Captain Thomas, who belonged to the locality, was in very close touch with local engineers and practically controlled his whole Area, the original scheme was not carried out, and the Area Office became the home of various officials independent of each other and responsible only to their different departments.

It had also been suggested in June, 1915, that each Area Office should include representatives of various other Government Departments, the Admiralty, the War Office, the Home Office and the Board of Trade.[5] This was only fulfilled in the case of the Admiralty, who in

---

[1] Hist. Rec./H./1121/2. The Secretary should " keep within his grasp all the threads of the local Area Office organisation, and he should be directly responsible to the office of the Minister in London. It would, therefore, be of paramount consequence to secure for the position of Organising Secretary at the local offices the very best man available."

[2] D.A.O./Misc./514. Minute of Captain Kelly, 19 July, 1915.

[3] Hist. Rec./H/320/8, M.W.29509. This was not immediately recognised, for at the conference between the Minister and the Superintending Engineers on 13 August, Mr. West said : " It is supposed to be laid down quite clearly that the Engineer is the Controller of the Office." (Hist. Rec./R./1121/35).

[4] The local organisation of Scotland, Ireland and the Metropolitan Munitions Committee diverged from type, as will appear later (see Chapters XII, XIII, XIV.)

[5] Hist. Rec./H./1121/2.

July, 1915, decided, in response to the Ministry's invitation, to nominate representatives in order to co-ordinate work in districts where they had important interests.[1] In May, 1917, in consequence of the Shipyard Labour Department coming under civil control, the Admiralty representative was withdrawn and a new organisation, known as the Admiralty Shipyard and Labour Department, was set up with headquarters in the various Area Offices.

(*b*) The Area Officials.

The tendency of each new department of the Ministry as its work developed was to set up its own outside staff, and the history of the Area Offices is, in brief, the history of the attempt to gather these different elements under one roof, thus, incidentally, advancing an important step towards the co-ordination of their work.

The earliest and most important addition to Area Officials was Trench Warfare Engineers. The Area Engineers had found an outside engineering staff of the Trench Warfare Supply Department already established, and it quickly appeared that the two forms of local organisation, existing side by side in the same district but working independently of each other, led to much confusion both from overlapping in the placing of contracts and from lack of uniformity in prices asked. It was accordingly arranged in September, 1915, between the two supply departments that the Trench Warfare Department should appoint a District Engineer to each Area under the new scheme, and that he and his staff should be located at the Area Office. Procedure was at the same time laid down by which the Trench Warfare Engineer remained responsible solely to and reported direct to his own department, while generally exhorted to keep in touch with the Area Secretary and Engineer.[2]

In October, 1915, the Transport Branch of the Ministry, which had hitherto carried out its local work by means of travelling inspectors, appointed experimentally a Transport Officer to the Birmingham Area Office.[3] Similar appointments were made to the other Area Offices as the increase of munitions traffic made it impossible to deal with it by inspectors from headquarters. In addition to his own work, the Transport Officer acted as liaison officer between the Area Office and the Railway Companies on all matters concerning railway transport.[4]

In 1917, the Department of Area Organisation undertook the provision of all local accommodation for other departments of the Ministry employing outside staffs,[5] and in this way the representatives of some eighteen branches of the Ministry[6] were brought under the wing of the Area Offices at different times, the only local organisation remaining

---

[1] D.A.O./Misc./22, 514.
[2] D.A.O./Misc./172, 145, 460.
[3] On the question of transport in the Scottish Area Office, see below, Chap. XIII.
[4] Hist. Rec./H./2020/2.
[5] D.A.O./Misc./1260/1.
[6] The number of officials varied in different offices (see Appendix I.).

outside being inspection of shell and stores and bonds. The most notable of the later additions to the Area Offices were made in August, 1917, when it was decided to transfer to them both the Chief Ordnance Engineers and the entire local staff (numbering some 300 persons) of the Aeronautical Inspection Department.[1]

Changes had meanwhile taken place in the work of the three permanent officials of the Area Office. With regard to the Labour Officer, the great expansion of work in connection with dilution and the investigation of general conditions of labour led in November, 1916, to a reorganisation of their local inspection staff by the Labour Department. It was then decided to supersede the Labour Officer and to appoint two independent officers in every Area[2] dealing with dilution and investigation respectively, who with their administrative staffs were located in the offices. These officers and their administrative staffs were, of course, attached to headquarters, but their clerical staff, for all purposes of discipline and pay, were controlled by the Area Secretaries.[3]

The terms of the Superintending Engineer's appointment were sufficiently wide to cover any work which he afterwards performed, and may here be recalled. He was to develop the resources of the Area as fully as possible along the lines laid down from time to time by the Minister of Munitions, he was to ascertain details of and report on available machinery, he was to inspect National Shell Factories, advise on the capabilities of firms and report on the progress of contracts. At the time of his appointment the speeding up of shell manufacture (especially in connection with local committees and Boards of Management) took precedence over other munitions work, and it was to the Shell Department of the Ministry that he was attached. So that, while in theory his duties remained as comprehensive as ever, his concentration on his departmental work together with the existence of the various local engineering staffs (as shown above) was bound to limit and confuse them in practice. Nevertheless, he always remained the principal technical representative of the Ministry in his Area, and the tendency was for an increasing amount of common service to devolve upon him.[4] This tendency was facilitated no doubt by his transfer in October, 1917, to the Area Organisation Department, which by detaching him from any individual supply department made it more possible for him to serve all.[5]

The duties of the Organising Secretary altered in degree rather than kind. He acted as Establishment Officer throughout, and, working in conjunction with the Office of Works, provided all office accommodation. He was solely responsible for all subordinate clerical staff. He also

[1] (Printed) *Weekly Report*, Nos. 105, II. (18.8.17); 110, II. (22.9.17); 114, II. (20.10.17).

[2] No Labour Officers were appointed to Ireland, and Edinburgh was controlled for labour purposes from the Glasgow Office.

[3] D.A.O./Misc./428.

[4] HIST. REC./R./1121/47.

[5] (Printed) *Weekly Report*, No. 114, II. (20.10.17).

acted as sub-accountant for his Area and was provided with an imprest covering all staff salaries and the travelling claims of Inspecting Engineers and others attached to the Area Office. He also investigated applications for the supply of petrol by firms on munition work; in some Areas as many as 7,000 applications had to be dealt with, and no petrol was supplied except on the Secretary's recommendation. Other duties have included at various times local investigations and reports on behalf of the Finance Department, the Priority Department, the Agricultural Machinery Department, and the Department of Explosives Supply. The Secretary remained attached to the Department of Area Organisation, to which he referred all questions involving policy.[1]

(c) The Delimitation of Areas.

The original decision as to the delimitation of Areas and the position of the Area Offices[2] was largely based on the needs of the local committees, whose adequate supervision was the immediate problem which Mr. Stevenson's scheme of decentralisation was called on to solve. It was, however, found possible to adhere to the initial divisions when, as events fell out, the work of the Committees and their Boards became only one of the many-sided activities of a Munitions Area. Experience proved that the arrangements might in some instances have been more convenient; thus on grounds of suitability of access, Cumberland and Westmorland might have been in No. 1 Area, Hull and Grimsby in No. 3; Area 4, too, proved somewhat too large.[3] It is also a question whether the boundaries of the Munitions Areas might not with advantage have coincided more closely with the Labour Areas.[4]

As the departments represented in Area Offices increased in number, fresh premises had to be acquired, but only in one case, that of Area 5, was it necessary to change the situation of the office. Here on the occasion of the reorganisation of their local inspection staff the Labour Department insisted on the importance of Cardiff rather than Newport as the headquarters and the Area Office was accordingly transferred to the former town.[5] During 1917, a number of Sub-Area Offices were set up in different munition centres in all the Areas, with the exception of Bristol, for the convenience of representatives of the Ministry, notably the Aeronautical Inspection Department.[6]

---

[1] Hist. Rec./R./1121/46; D.A.O./Misc./54,175, 600/3; D.A.O./2/69; D.A.O./3/665, D.A.O./Unregistered Papers/157. From 1916 onwards, in order that they might keep in touch not only with D.A.O. but also with each other, meetings of all Organising Secretaries were summoned to Armament Buildings at recurring intervals.

[2] See above, Chap. II.

[3] Hist. Rec./R./1121/46. Memorandum by Mr. McLaren.

[4] Workington, for example, which was under the Manchester Area Office for munitions was controlled from Newcastle for labour purposes (D.A.O./2/922).

[5] D.A.O./Misc./428. D.A.O. agreed that the reasons for which Newport was chosen originally as the Area Office were no longer urgent as the National Shell Factories were at this date fully established.

[6] See Appendix I.

II. The Relations between the Area Offices and Boards of Management.

The critical and even hostile attitude which Boards generally were inclined to adopt when Area Offices were first set up has already been touched on.[1] Whether it would have continued had the degree of decentralisation of authority at first contemplated been maintained, is a moot question. As events fell out, the relationship between Area Officials and Boards of Management was (with a few minor exceptions)[2] a cordial one and was marked by an increasing tendency towards co-ordination in their work, owing in great measure to the work of the Board of Management Executive Committee and to the appointment of Area Executive Committees.[3]

Until the beginning of 1918, the activities of the Boards were chiefly confined to the production of shell and shell components, so that they were, as a matter of fact, only brought into immediate contact with the permanent officials of their Area Office, that is to say, the Organising Secretary and the Superintending Engineer.[4] The duties of the Area Secretaries expanded comparatively little as far as Boards of Management were concerned, and it was the Superintending Engineers and their assistant staffs who came into closest personal relation with them. During the latter part of 1915 the Superintending Engineers took a practical part in the organisation of such Boards as had not yet been able to formulate definite schemes, investigating the resources of their district and reporting to the Ministry as to the best plan of utilising them.[5] Sometimes they carried through the entire organisation of a group, as for example, in Sussex, where a Board was set up by the Engineer of Area 7, in a straggling agricultural district whose main asset for munitions work was local enthusiasm.[6] This actual participation ceased when the Boards passed, sooner or later, beyond the experimental stage, as co-operative contractors gained in experience and National Shell Factories began to run smoothly under suitable management, but the Superintending Engineer remained in theory chief technical adviser to the Boards and combined a systematic inspection of National Shell Factories and the working of co-operative schemes with the other powers which he wielded in his Area alike over Boards and direct contractors.

Various means were employed for keeping the essential touch between the Area Officials and the individual Boards. From the beginning certain Boards had invited either the Secretary or the Engineer or both to their meetings, and this proved of such mutual assistance that in May, 1916, the practice was, at the request of the Director

---

[1] See above, Chap. II.
[2] HIST. REC./R./1121/47; HIST. REC./H./1121·24/6.
[3] See above p. 19.
[4] For some account of the relations of the Trench Warfare Supply Department with Boards who undertook work for them, see below, p. 36.
[5] See also below, under East and West Cumberland Boards, Bury, Lincolnshire, Oxfordshire, etc.
[6] HIST. REC./H./1121/5.

of Area Organisation, adopted by all Boards.[1] A further step towards co-ordination was taken in 1917, when it was decided to set up Area Executive Committees. These committees were to meet at the Area Offices and were to be composed of a representative from each Board of Management in the respective Area, and, *ex officio*, the Area Secretary, the Superintending Engineer, the District Engineer of the Trench Warfare Department, the Senior Inspection Officer of the Area, an officer of the Central Clearing House, and the chief Dilution Officer. The new committees were warmly welcomed by Boards of Co-operative Groups, but in Areas where Boards of National Shell Factories preponderated it was either decided, as in the Newcastle Area, not to set up a committee or, as in the Cardiff Area, to call meetings at irregular intervals when required. The subjects of recurring discussion at these meetings were a closer co-ordination with the various officers representing the Ministry, the best means of filling the weekly list of special requirements and the disposal of scrap, but special questions relating to such matters as hours of labour and dilution were discussed as occasion arose.[2]

The institution of these Area Executive Committees could not fail to effect some *rapprochement* between the Offices and the Boards, but even so Boards in certain Areas complained in September, 1917, on a question arising out of the failure of contractors to maintain their promised output, that their relations with the Superintending Engineer were not so close as was desirable. In other Areas, and particularly in Manchester, one of the largest and most important, however, a most satisfactory co-operation was said to exist between the Boards and the engineering staff.[3]

III. The Tendency towards Unification of Work.[4]

It has been shown that the Area Office did not become, as Sir James Stevenson had intended, the local agent of one large business firm, but rather was comparable to an office sheltering the local agents of many and different firms, with much of the wasteful overlapping and misdirected energy which must result therefrom. The only point of contact for local matters at headquarters common to all departments was the Director of Area Organisation, whose interest was almost entirely limited to Board of Management contractors. Locally the results of departmental autonomy were considerably alleviated and,

---

[1] D.A.O./Bds./4.

[2] D.A.O./Bds./69, D.A.O./1/361, 2/1095, 3/611, 4/865, 6/645, 5/419. Liverpool Board of Management, which controlled six National Shell Factories, refused to send a representative to No. 2 Area Executive Committee.

[3] Boards of Management Executive Committee, 230 (11.9.17), 461 (16.4.18). The Manchester Board wrote in 1919: "The Ministry Superintendent Engineers of the Area were to all intents and purposes all but members of the Board, they attended meetings, took place in discussions and generally by their action helped to create an attitude of mutual confidence, which greatly facilitated the work of the Area." (D.A.O./Misc./1394).

[4] D.A.O./Misc./413, 574, 1017, 1052; HIST. REC./H./1600/11; HIST. REC./H./1000/10; General Office Memoranda; Minutes of the Boards of Management Executive Committee.

given the circumstances, the existence of the Area Office as a common home for representatives of all departments was a good solution of the position. The Area Secretary acted as liaison officer, and economical administration was secured by a system of pooling the same clerical staff to serve all representatives. Again, the very fact of being under the same roof encouraged representatives to take advantage of each other's experience, even though (as in the case of Trench Warfare Engineers) the rule might run that all reports were made direct to the department, who informed the Director of Area Organisation, who then informed the Area Office. The Area Executive Committees, too, though primarily set up for the needs of Boards of Management, brought together important local officials. Early in 1916, however, as departments increased, each organising its own outside staff and working on its independent lines, it became very evident that a central authority which should control a local common service for the supply departments was needed. Although advisory only in character, the Central Clearing House (in the establishment of which the Director of Area Organisation's part has been already mentioned)[1] must be regarded as a first step towards unification. Locally it was certainly so. In each Area Office (with the exception of the Irish Offices) an Area Clearing House was set up controlled by a small executive Board, composed of the Area Secretary, the Superintending Engineer and the District Trench Warfare Engineer, which met daily. The actual work of tracing, scheduling, registering and instantly transmitting reports to London was done by an Area Liaison Engineer acting in close co-operation with the Area Secretary. Within the limitation of its own Area the Central Clearing House Board might negotiate on its own authority the transference of machines. The Area Clearing House Boards, including as they did the Superintending Engineers and the District Trench Warfare Engineers, thus helped to link up the work of the two most important local supply officials.[2]

By the end of 1917 the ill effects arising from independent local action in the Areas culminated, and suggestions, which were to result in the setting up of the Department of Engineering, began to be formulated. The new department affected the Ordnance Group only, and its functions were of a common service character. It was designed to be the source of information on the technical side of ordnance production and on the manufacturing programme of the supply departments of the group. All the work hitherto carried out by the Central Clearing House was to come within its province, and in addition it was to investigate cases of inefficiency, delay or other production problems, and generally advise on questions of improving or reducing outputs. In March, 1918, its constitution was definitely laid down, and it was

[1] See above, pp. 19–20.

[2] Captain Kelly, the Director, experimented in the Birmingham (No. 4) Area as to the best method of local organisation. He was greatly assisted by the Trench Warfare Outside Engineering Branch, some of whose methods, notably that of scheduling idle machines which had already been allocated, he adopted. The Liaison Engineers were also transferred by consent from that Department when they had gained experience in outside engineering work.

stated that henceforward all the outside engineering staff (including that of the Trench Warfare Supply Department) would in future form part of the staff of, and would be responsible to, the Controller of the Engineering Department. The weakness of the new department lay in the limitation of its functions to a particular group, which was bound to hamper its efficiency, but this was being gradually but surely broken down when the Armistice came to interrupt its work.

The aim of the new department was to institute a system of local administration which should affect existing conditions as little as possible. The personnel at Area Offices remained unchanged, but all the outside engineering staff of an office (including the Superintending Engineer and his staff, who were transferred from the Department of Area Organisation)[1] was now to become an Area Engineering Board under the direct control of the Engineering Department. The Area Engineering Board also absorbed the functions of the Area Clearing House Board, which now disappeared. The Secretary of the Area Office became in most cases Secretary to this new Board.

During their few months of existence the Engineering Boards did good work ; periodic meetings were arranged at which engineers representing all Government Departments attended and to which Boards of Management were invited to send representatives.[2] The attitude of the Boards of Management appears to have been friendly to the change.[3]

Owing to the tardy co-operation in the scheme of the supply controllers, the Engineering Boards never became as representative as was intended, and in August, 1918, the last step in what may be termed the centralisation of decentralisation took place. The Area Engineering Boards were then superseded by the Superintending Engineer, who became chief representative in the Area. As adumbrated in this final scheme, his engineering staff was to be divided into sections, each detailed for the work of a supply department with which it would keep in close touch ; there would also be a number of assistant engineers, whose services could be pooled among the various sections. This scheme was capable of indefinite expansion within itself, and, had time allowed, all outside technical staffs would have ultimately come within its scope. Its development was of course arrested by the Armistice, but it marks a definite reversion to the early principle of a centralised local control.

---

[1] (Printed) *Weekly Report*, No. 132, VI., A. (2.3.18).

[2] Minutes of Board of Management Executive Committee, 16 April, 1918, 461 ; *Ibid.*, 4 September, 1918, 503.

[3] The Director of Munitions for Scotland reported that there had been a marked improvement in co-ordination in both the Edinburgh and Glasgow Offices as a result of the setting up of the Board (D.A.O./Misc./1017).

CHAPTER V.

THE BOARDS OF MANAGEMENT.

I. The Boards as Units of Administration.[1]

(*a*) Their Setting-up and Relations to Local Munitions Committees.

Boards of Management were, as has been seen, small executive committees formed, in the first place, at the instance of the Armaments Output Committee and afterwards of the Ministry of Munitions, from the large Munitions Committees which, from the spring of 1915 onwards, were set up locally. The greater number of these local committees were already in existence at the time of the Ministry's creation, and six Boards had already received War Office approval. Between June and September, 1915, 40 other Boards were sanctioned, making a total of 46 Committees and Boards in all, exclusive of Ireland.

Two executive bodies were thus drawn from the local Munitions Committees, the Boards of Management drawn from the employers and the Labour Advisory Boards from the labour members,[2] and these committees found themselves in consequence shorn of their main functions. The principle of the Ministry was to ask them to remain on as advisory bodies, and in this capacity several of them continued to do good work,[3] but the tendency was for them either to dissolve by mutual consent or to meet at very rare intervals.[4]

The method of electing a Board of Management had already in June, 1915, become stereotyped. As soon as the proposals of any committee had been approved at headquarters they were asked to select from their numbers nominees for an executive body to carry out the proposed scheme. The names were then submitted to the Director of Area Organisation, on whose recommendation they received the ministerial approval, which was their formal authorisation to embark on

---

[1] Hist. Rec./R./1121/46, 47, 48; Hist. Rec./H./1121·27/1, 1121·24/6, 1121·22/6; 1121·26/1, 2; Vol. I., Part III.; D.A.O./1/425; D.A.O./5/505; D.A.O./Misc./418, 1260, 238, 30, 1251; D.A.O./4/524.

[2] See above, p. 10.

[3] In some of the early agreements between the Boards and the Ministry a clause was expressly inserted to the effect that the Board would be assisted in the general promotion of their scheme by their Munitions Committees.

[4] The Welsh National Committee for Munitions of War, in particular, which embraced the whole of the South Wales Area, continued to give valuable assistance especially on the labour side. Towards the close of 1915 the Metropolitan Munitions Committee attempted to assert their position as an executive body to whom the Board of Management was subject. An appeal to the Ministry led to an official limitation of their functions to consultative purposes.

their work. Labour representatives, as such, were not allowed on Boards of Management, whose powers with regard to labour were recommendatory only.[1]

The appointment of suitable Boards was a matter of extreme difficulty. It was necessary in the interests of efficient management to limit the membership to five persons (generally four members and a secretary), though this number was in special cases exceeded.[2] It was equally essential that persons of some local standing, preferably engineers, should be appointed. A noteworthy result of the care taken in selection was the comparatively slight changes in the personnel of Boards as originally appointed by the Minister.[3]

(*b*) The EXPANSION OF THE "GROUP" SYSTEM.

The alternative schemes which Boards were at first called on to administer were either for co-operative work or for a National Shell Factory. They differed essentially in character. The Co-operative Group of manufacturers, each of whom could undertake certain processes, resulting ultimately in the assembling of the complete shell, was the earliest method of employing the resources of the local committees and was first adopted at Leicester in April, 1915. The national factory scheme, by concentrating available machinery under one roof, avoided the main difficulty of competent inspection and supervision when a number of small firms were concerned and was the outcome of proposals made at a slightly later date by the Leeds group. In eight instances Boards of Management undertook the administration of both Co-operative Groups and National Shell Factories.[4]

With regard to the former of these two schemes, there was in many cases an early departure from the original intention of co-operation in the actual processes of manufacture. The tendency was for co-operative work either to disappear or to become subsidiary to the main work of a third type of group whose members—especially in large industrial centres, as at Manchester, where schemes of magnitude were carried out—received entirely independent contracts from their Board, acting on behalf of the Ministry of Munitions.[5] Although the main work of the groups was ultimately carried out by individual contractors, the co-operative scheme, of which the Leicester group remained throughout the outstanding type, never disappeared; the Wakefield Board, for example, manufacturing 18-pdr. shrapnel by

---

[1] The Birmingham Board (approved before the formation of the Ministry) was an exception and had a labour representative throughout, as did also Newport.

[2] See for example, under the Sheffield Board, p. 90.

[3] See Appendix IV.

[4] The Boards of Management of the National Filling Factories at Leeds, Liverpool, Gloucester and Georgetown worked under the Gun Ammunition Filling Department and must not be confused with the Boards of Management of the Area Organisation Department, by whom they were originally set up. (See Vol, VIII, Part II, Chap. V.)

[5] At headquarters the original title of "Co-operative Group" continued to be applied whether a Board's contractors worked independently of or in collaboration with one another.

co-operative methods and the Scottish Boards, the Sheffield Board and the Sussex Board all undertaking contracts for trench warfare supplies on these terms.[1]

(c) The Board of Management of a Group.

Once a Board had received ministerial approval an agreement was drawn up with the Ministry. These early agreements conform to type[2] and the position of Boards under them may be thus summed up. The Board undertook an order for a specified quantity of shell to be delivered within specified dates at a specified price. This order was to be distributed amongst various engineering firms in the district and the Boards would be responsible to the Government for the shells manufactured. The Board was to rent a building to be used as a central store for the assembly of shell from the various firms for Government inspection. The expenses in connection with this store were to be defrayed by the contractors themselves. The area controlled by the Board was defined in these agreements and very often comprised the district covered by the local Engineering Employers' Association.[3] Under the early agreements the contracts were placed direct with the Boards, who then sub-contracted on their own behalf to the local firms.

A Board of Management of a Group was not allowed to place contracts outside the area which it controlled. Within the area the rule was laid down in August, 1915, that the Ministry or War Office would continue to deal with firms with whom they had already placed direct contracts, but that otherwise contracts would be placed through Boards of Management though the arrangement would depend on the facilities possessed by Boards in particular districts. This rule was never rescinded, though the exceptions to it were exceedingly numerous.

Members of Boards of Management could, in their individual capacity, take contracts under their Boards and in many instances availed themselves of the privilege. The procedure was for a member submitting an offer to withdraw from the meeting at which his contract was discussed.

Certain Boards of Management, when first established, received an advance from the Ministry for working capital. Boards of Assisted Groups, as they were termed, were responsible for the return of any

[1] Occasionally local firms themselves co-operated to work under a Board, as at Hull, where the contractors formed a syndicate and had a common warehouse where several of the finishing operations were performed on all the shell. Limited companies were also formed by contractors for the same purpose, *e.g.*, Portsmouth Munitions, Ltd. (contractors to the West of England Board); Walsall Munitions, Ltd., and West Bromwich Munitions, Ltd. (contractors to the Birmingham Board); and West Cornwall Munitions, Ltd. (contractors to the Cornwall Board).

[2] See Appendix II.

[3] In some areas, local Munitions Committees had been formed whose prospects did not justify the setting up of a Board of Management, and these became affiliated to and acted as contractors to the Board controlling the area, *e.g.*, five local committees set up at Stoke-on-Trent, Walsall, Kidderminster, Burton-on-Trent and West Bromwich respectively, worked under the Birmingham Board.

advance and for its proper expenditure. These early loans were, as a rule, free of interest, but later advances were charged interest; thus the East Anglian Board received a free loan of £15,000 when it first started, but later advances amounting to £43,000 were charged with 5 per cent. interest, charged to the contractors of the group. Fourteen Boards, exclusive of the Metropolitan Munitions Committee, were assisted in this manner with amounts varying between £500 in the case of Blackburn and £25,000 in the case of Liverpool. In a few instances these loans remained outstanding, but by the beginning of 1917 the major number had been repaid, though some Boards continued, as instanced by the East Anglian Committee, to receive imprests for administrative expenses. All outstanding loans were called in by the beginning of 1918 when the change of procedure, by which the Boards in future were to deal with the Ministry on a cash basis, was effected.[1]

(*d*) THE BOARD OF MANAGEMENT OF A NATIONAL SHELL FACTORY.

The agreement between the Board of a National Shell Factory and the Ministry followed in all cases the same model—that which was drawn up in May, 1915, between the Leeds Board of Management and the Government.[2] The position of a Board under this agreement may be thus summed up. The Board was authorised to rent suitable premises at a rent approved by the Government, whose sanction was also to be obtained for the erection of any new buildings or extension. The Board could equip the factory with machinery either by hire or purchase; any purchase of new machinery was to be referred to the Government, which was to be the owner or lessor of all machinery in use at the factory. The Board was empowered to engage labour and appoint suitable engineering, administrative and secretarial staffs and provide necessary staff accommodation; no salary in excess of £500 per annum was to be authorised without the prior approval of the Government. The Board was to have all necessary funds placed at its disposal by the Government, and an auditor to the factory was to be nominated by the Board but to be appointed by and responsible to the Government. In conclusion, the Board offered their voluntary services to the Government from whom they were to receive technical advice and supervision.

These early agreements gave the Boards very wide powers, subject only to the general lines of policy laid down by the Ministry of Munitions. As the central organisation grew stronger, however, they were to a considerable extent restricted and questions relating to purchase of machinery, extension of buildings, audit of accounts, etc., were taken more directly under ministerial control.[3]

---

[1] See below, p. 41.

[2] See Appendix II.

[3] For details of this centralisation see Vol. VIII, Part III, Chap. II; Vol. III, Part III. The practice with regard to purchase of machinery was that expenditure up to £500 could be sanctioned, on investigation, by D.A.O. Any expenditure in excess had to be sanctioned by the Shell and Components Manufacture Executive Committee or, later, the Munitions Works Board. (D.A.O./Misc./1260.)

(*e*) THE STATUS OF BOARDS OF MANAGEMENT.[1]

The position of the Board of a National Shell Factory, as the direct agent of the Ministry with whom, ultimately, all responsibility for the production of shell rested, was quite clear. Their financial powers were limited; all necessary funds were placed at their disposal by the Ministry, but no capital expenditure could be made without the Ministry's consent; the manager and entire staff of the factory were engaged by them, but no salary in excess of £500 could be paid without special permission from the Ministry; the auditor of the factory, though originally nominated by the Board, was appointed by and responsible to the Ministry.[2]

The position of the Boards of Groups was more ambiguous. The model agreement for these Boards was prepared on the assumption that they would be the manufacturer on co-operative lines and would take the ordinary responsibilities of contractors. This, as has been shown,[3] proved the exception rather than the rule and it became necessary to safeguard the position of the Board with its contractor. A form of contract, drawn up in consultation with the Treasury Solicitor, was accordingly issued in September, 1915,[4] for the use of Boards and their contractors, which made it clear that the Boards were only acting as agents of the Ministry.

In addition to this, several Boards making agreements after June, 1915, asked for the insertion of indemnity clauses, protecting them against personal responsibility. In the Sheffield agreement the clause ran:—

> "The Board shall do everything in their power to administer successfully the duties hereby entrusted to their charge, but they shall not personally, either individually or collectively, incur any financial responsibility in connection therewith except as provided in clause 9 thereof."[5]

Similar clauses were inserted in the Tyne and Wear and Bury Boards of Management's agreements with the Ministry, and in that of the Manchester Board of Management when, in December, 1915, it was brought into line with the procedure of other Boards.

The Boards were always very particular in disclaiming any financial responsibility, and a request by the South-East Midlands Board for a

---

[1] D.A.O./Bds./5, 65; HIST. REC./R./201; Minutes of Board of Management Executive Committee, 17 July, 1917, 164; D.A.O./Misc./1251; D.A.O./7/137.

[2] The auditors, who were furnished in October, 1915, with a simple system of accounting, remained mainly responsible to their respective Boards until in April, 1917, it was decided that their work should be brought into line with that carried out by the headquarters audit staff at other national factories, and that they should henceforward act under instructions from the Chief Factory Auditor.

[3] See above p. 31.

[4] D.A.O./C./1.

[5] Clause 9 referred to the sum advanced to this group, which was an Assisted Group. (See below, p. 90.)

definition of their precise relationship to their contractors led to a ruling on the general question on 30 November, 1915. The Ministry then decided that as long as a Board of Management acted within the scope of their authority from the Ministry and without negligence, the individual members of the Board would not be responsible for the failure of a contractor to carry out his contract.

At the same time certain decisions serving to protect the Ministry were laid down as to loans made by Boards to contractors. Any sum advanced to a contractor was to be considered a loan unless it was paid as part of the price of goods actually in the course of manufacture. No loans were in future to be made except with the prior approval of the Ministry, which would only be given where the Board had obtained full legal security from the contractor.

II. The Relations of Boards with their Contractors.

(*a*) The Administrative Expenses of Boards of Management.[1]

The services of all members of Boards of Management were voluntary, though, where desired, out-of-pocket expenses were defrayed by the Government. The secretaryship of the Board was in some instances a paid position.

The Ministry placed all necessary funds for administrative expenses connected with the running of a National Shell Factory at the disposal of the Board. These advances were automatically recovered by the Finance Department by charging them to factory costs.

The general procedure laid down for Boards of Management of Groups was that administrative expenses should be covered by the difference between the contract price arranged between the Ministry and the Board and the price which the Board paid to the contractor. Any surplus which might be left in the Board's hands at the end of the contract was divided *pro rata* among the contractors. The Ministry seems to have considered $\frac{1}{4}$ per cent. a reasonable charge,[2] but exercised no supervision over the administrative expenses of a Group since the manner in which they were met concerned the Board and its contractors only. The expenses of different Boards varied considerably; at Manchester, whose turn-over in 1917 (£180,000) greatly exceeded that of any other Board, they came to

[1] Hist. Rec./R./1121/47; Hist. Rec./H./1121·22/6; D.A.O./Misc./189, 1394; Hist. Rec./H./1121·24/4, 7; D.A.O./Misc./1148; D.A.O./7/575; D.A.O./7b/1303.

[2] This was the percentage fixed for the Manchester Board in December, 1915. Expenses were mainly incurred in connection with the renting of offices (though in some cases, *e.g.*, at Liverpool and Manchester, these were obtained rent free), the salaries of secretaries or managers and the renting and upkeep of the central depots. The East Anglian Board erected their own depot at a capital cost of approximately £15,000.

$\frac{1}{8}$ per cent,[1] Coventry working on a smaller scale deducted 1 per cent. from its contractors, while the West of England Board, operating over nine counties and with a comparatively small turn-over, brought expenses down to less than $\frac{1}{4}$ per cent.

The last-named Board furnishes an illustration of the difficulty arising when a Board controlled both a National Shell Factory and a Co-operative Group, for the work of the factory was largely mixed up with that of the group, resulting in a confusion of accounts which acted at one time in favour of the Board and against the Ministry.[2] The Birmingham Board indeed made no attempt to adjust the double claim and, until brought into line in 1918, the full administrative expenses were charged against the Ministry's imprest account and nothing was recovered from the Board's contractors.

By a special arrangement, Boards of Management were until October, 1918,[3] allowed to charge expenses connected with trench warfare supplies to the Ministry instead of making deductions from payments to contractors as in the case of other munitions.[4] As a result the administrative expenses of certain of the smaller Boards fell entirely on the Ministry. These expenses were often very high in proportion to the output as is exemplified in the case of the Sussex Board of Management, whose turn-over between 1915 and 1918 was only £244,636, but whose administrative costs were 1·88 per cent.

The Metropolitan Munitions Committee, an Assisted Co-operative Group organised on a magnificent scale, formed another exception to the general rule, being administered from funds supplied by the Ministry on imprest subject to post-audit account. Already at the close of 1915 it was felt that organisation was on too lavish a scale and an investigation then made led to certain retrenchment. The question was once more raised in September, 1917, when the Finance Department pointed out to the Director of Area Organisation that the committee's total expenses to date were more than 1 per cent. of the total value of orders placed and were higher in proportion than those of any other Board. These high costs, combined with the reduced munitions programme, under which the number of the committee's contractors was likely to be seriously diminished, led to the decision at the beginning of 1918 to dissolve the Metropolitan Munitions Committee and transfer their work to the Ministry of Munitions.[5]

---

[1] The Manchester Board continued, however, to deduct $\frac{1}{4}$ per cent., and after the Armistice the Board and its contractors decided to apply the unspent balance towards the endowment of engineering scholarships in the College of Technology, Manchester, where the Board had occupied premises rent free.

[2] A proposal to separate contract accounts from factory accounts was considered by D.A.O. and the Finance Department, but though there was general agreement as to its advisability it was not carried further (D.A.O./Misc./189).

[3] The arrangement was rescinded as from that date, and management expenses were henceforward borne by the contractors, as in the case of other munitions.

[4] The Boards of Groups were inclined to resent, on behalf of their other contractors, the preferential treatment which trench warfare contractors thus received, and the Manchester Board refused to deal with trench warfare contracts for this reason (Minutes of Board of Management Executive Committee, 494, 2 July, 1918).

[5] See below, Chap. XII.

(*b*) The Class of Work Undertaken.[1]

Boards of Management of Groups, like Boards of National Shell Factories and for the same reasons,[2] were at first concerned with placing contracts for shell and components among their contractors, and the main work of Groups throughout their existence was concentrated on these munitions.[3]

The manufacture of trench warfare stores, which for various reasons commended itself to Board of Management contractors, was also taken up from the first. The labour required was less skilled, the plant less complex, less experience was necessary for manufacture, so that the work could be taken up by smaller firms, leaving the larger firms to devote themselves to shell production. Boards such as Sussex and Oxfordshire controlling agricultural districts with no big industrial centres, or Lincoln, where only the smallest firms were left to organise, accordingly concentrated almost entirely on the simpler types of trench warfare munitions. The contracts placed by Boards of Management have not on the whole however formed a high proportion of the trench warfare work carried out in their districts ; at Birmingham for example, a scheme of some importance for co-operative production of grenades was carried out independently of the Board, which only placed an isolated contract for bomb-heads : in the East Anglian district too, though a large amount of trench warfare work was done, the Board received no contract. This failure to make use of them for work which they felt peculiarly fitted to perform was an early grievance of the Boards and was partly due to the fact that the Trench Warfare Department had already in June, 1915, a local organisation of their own.[4] It was brought forward at a conference held on 16 December, 1915, between Dr. Addison, the Director of Area Organisation, the Director-General of the Trench Warfare Department and a sub-committee representing twenty-one Boards of Management. It was then agreed as a general policy that in future 80 per cent. of contracts for trench warfare stores should be placed through Boards of Management. As the manufacture of trench warfare weapons developed and increased in complexity the department found it impossible to carry out this arrangement. In January, 1917, when the Department of Area Organisation once more raised the question, it was pointed out that a percentage rule could only apply to certain stores which had become more or less standardised and were required in large quantities, and that no contracts for stores in the experimental stage could be placed by Boards of Management.[5]

[1] D.A.O./Misc./44, 145, 172, 279, 344, 460, 503, 1260/1, 1394; D.A.O./Bds./17, 47 ; (Printed) *Weekly Report*, No. 82, II (3.3.17), No. 90, XVI (5.5.17).

[2] See below, p. 46.

[3] For shell output see Appendix V.

[4] See above p. 22 ; see also Vol. XI., Part I.

[5] The only standardised stores were said to be 3-in. Stokes shells for which very few new contracts were being placed, and 2-in. trench howitzer bombs for which all contracts were being rapidly cut down. Other stores for which there was a long and continuous demand (*e.g.*, cartridges, exploders, flares and pyrotechnic stores) could only be undertaken by a limited number of contractors, while Mills grenades were by a special agreement exempted from the rule.

The grievance against the Trench Warfare Supply Department serves to typify a constantly recurring feeling among Boards that they were not being made sufficient use of. In June, 1915, it had seemed possible that the main burden of all increased local production might fall on them[1] but although frequent inquiries were made of the Boards by the Ministry during 1915 as to the capacity of their districts for various miscellaneous stores, the resulting contracts were placed direct with the firms.

Their advisory capacity was further recognised in June, 1916, when the general reduction of 18-pdr. contracts made it urgent that other work should be provided for a large number of their contractors. The Minister then suggested to the Aeronautical Department (at this time attached to the War Office) that they might with advantage make use of the Boards, and it was accordingly arranged that Boards should investigate the capacity of their districts and make provisional allocation of work on behalf of the Aeronautical Department, who would retain direct control of any contract that might be placed. The Air Department of the Admiralty, at their own request, also came to the same arrangement with Boards.

As has already been noticed[2] from the beginning of 1917 the Board of Management Executive Committee had carried out most important work in relation to the Boards, and by the close of 1917 other causes combined to enlarge the scope of the Boards' activities.

In the first place, in view of the great shortage of what were known as Aeronautical General Supplies, or A.G.S. parts, the Ministry determined to ask Boards of Management once more to canvass their districts for surplus capacity and to place contracts for this type of munitions. The proposition was laid before a full meeting of the Boards by Mr. Churchill on 6 November, 1917.

> "We are very anxious," he said, "that you should study the problem of producing what are called aeronautical general standards. There are a great number of these and their multiplication to an enormous extent plays an essential part in the development of our great aeroplane programme . . . . If you are able to add to your achievements in the regions of shell, a great reinforcement to our aeronautical programme,

[1] Mr. Lloyd George in the course of his speech introducing the Munitions of War Bill, on 23 June, 1915, said: "There is only one way of organising the resources of the country efficiently within the time at our disposal. That is that each district should undertake to do the work for itself, and that we should place at their disposal everything that a Government can in the way of expert advice and in the way of material, because we have ourselves offered to supply the material wherever it is required. Anything in the way of expert advice, specifications, samples, inspection and material—that we can supply; but we must rely upon the great business men of each locality to do the organisation in those districts for themselves, and they are doing it." (*Parliamentary Debates*, 1915 (H. of C.), LXXII., 1191.)

[2] See above, p. 19.

you will, in the fifth campaign of the War, have struck a new blow of vital consequence, of real and genuine help to the cause of our country and the cause of our Allies."

Steps were at once taken by the Boards to find manufacturing capacity and within six weeks of the meeting contracts for 17,967,000 parts had been placed and manufacture was begun. In January, 1918, the Air Board asked for assistance in procuring capacity for an additional 23,000,000 parts and by June, 15 Boards had placed contracts in their districts with some 90 contractors.[1]

The beginning of 1918 witnessed a further expansion in the Boards' work, partly owing to the reduction of the munitions programme (which set free a large number of the Boards' contractors for whom it was essential from every point of view to find work), but also largely due to the fact that their value in tapping hitherto unsuspected sources of supply was beginning to be recognised. Among the special stores for which the Boards now placed contracts were tanks for the Mechanical Warfare Department[2] and machine gun emplacements, dynamo exploders, and other special requirements, "which bristled with technical difficulties in manufacture," for the War Office. In some cases, as for example agricultural machinery, where the Board did not actually place contracts, they recommended capacity. Finally, in June, 1918, Sir James Stevenson invited Boards of Management to investigate the possibilities of their contractors for the supply of guns and gun parts. This opened up a field of some magnitude and a committee, known as the Boards of Management Ordnance Committee, of which Mr. Newlands was chairman, was set up at headquarters to work in close co-operation with the Gun Department. A certain number of contracts were placed, but here, as was the case with all fresh work undertaken in 1918, full development was arrested by the Armistice.

Mention must not be omitted of certain other sides of their work common to Boards of National Shell Factories and Groups alike. In conformity with the arrangement made in August, 1915, they assisted the Badge Department by investigating and recommending local applications for war badges, and in some instances acted as advisers to munition tribunals on claims for exemption. To these duties were added from time to time others arising more or less directly from the manufacture of munitions, such as the training of munition workers, the dilution of labour or questions of transport. They also took a leading part in the official reception of the King and Queen on the occasion of their progresses to the various munition centres which were a feature of 1917.

---

[1] As Mr. Churchill had foreshadowed, the Boards of Management were hampered by considerable difficulties of manufacture. The Manchester Board, who were very large contributors under the scheme, considered the chief causes of delayed production were firstly the inability of the contractors to obtain the necessary screwing and tapping tackle, and secondly the difficulty of obtaining the release and delivery of machine tools.

[2] See below, Chaps. VIII and XII, under Manchester and Scotland.

(c) THE SUPPLY OF MATERIALS.[1]

When the earliest Boards of Management made their agreements with the Ministry it was not unusual for them to undertake, where there was local opportunity, to find the raw material for their contractors; the Birmingham, Coventry, East Anglian, Hull, Leicester, Liverpool and Wakefield Boards all agreed to find forgings for their contractors. The greater number of Boards, however, were supplied with forgings by the Ministry at a fixed price, and also with steel for the manufacture of 18-pdr. H.E. shell. Components were at first purchased by the Boards themselves or by their contractors. There was great discrepancy in the prices charged for materials to different Boards: in most cases they were higher than those obtained by the Ministry, and had much to do with the early high cost of shell.

At the beginning of 1916 the Ministry, realising the necessity of controlling the production and distribution of materials, instituted a system of central purchase, under which the principal materials required by contractors for the manufacture of munitions were either purchased from the Ministry direct, or from sources indicated by the Ministry, at prices fixed officially. This system was applied to co-operative contractors, and in March, 1916, all Boards of Management were informed that in addition to steel for 18-pdr. shell, certain types of stores[2]—shell forgings, base adapter forgings, base plates and nose bushes—would in future be dealt with by contracts placed direct by the Ministry.

Steps were taken by the Director of Area Organisation to secure for Boards an adequate supply of materials in comparison with direct contractors. Monthly allocations of steel were made, based on reports from the Gun Ammunition Department as to the steel available, and were sent to the Steel Department, who issued a warrant to the steel-maker for approximately the amount allocated by the Department of Area Organisation. Although the full quantity of steel allocated for each Board of Management's contract was seldom or never available and deliveries were very irregular, Boards in this way secured the fair proportion of their requirements during periods of shortage. The allocation of forgings was made in a similar manner, but there was not here the same difficulty, as shortage could generally be made good at a day's notice.

The system of central purchase gave rise to the general question of claims made on the Ministry by contractors either on account of defective material supplied by the Ministry or for work done on such material. All such claims made by group contractors were closely investigated in the Department of Area Organisation, and on

[1] HIST. REC./R./1121/29; HIST. REC./H./1121·21; 1121·22/1; 1121·24/6; D.A.O./Misc./30, 238, 1260/1, 1394; 94/Gen./411.

[2] Liverpool and Wakefield were exceptions to this rule and continued to make their own forgings.

occasion were referred back to the Boards concerned for further consultation with their contractors. By this means a large number of claims were reduced before the department passed them for payment. The total amount of compensation paid to Board of Management contractors was £243,022 3s. 9d.; the largest amount claimed was £70,390 15s. by the Metropolitan Munitions Committee, and the smallest £127 4s. by the Leeds Board.[1]

(*d*) The Methods of Payment to Contractors.[2]

Contractors received payment as and when payment was made to the Board by the Ministry of Munitions. Under the "Decisions" of 26 August, 1915, a Board was entitled to advance to its contractors, before firing proof, up to 80 per cent. of the contract price of goods delivered. Experience showed that a general application of this rule was inadvisable, and in October, 1916, all Boards were instructed to use discretion where a firm was likely to be unsatisfactory, and to advance only such percentage as would cover the value of the proportion of the contract likely to be accepted.[3]

The flaw in this scheme of payment was that the Boards had no precise information regarding the other side of the account, namely, that dealing with materials supplied to contractors by the Ministry. Since the beginning of 1916, as has been shown,[4] a system of central purchasing had been adopted, and the whole of the accounts in connection with the delivery of materials were kept at headquarters. The Boards exercised considerable check on contractors' accounts so far as they were informed by the Ministry, but large quantities of materials were sent to contractors, in many cases without advice to the Boards concerned and in some cases without charge to the contractor. The Manchester Board were voicing the general feeling of the Boards when, in March, 1917, they pointed out to the Director of Area Organisation that under the circumstances they repudiated any responsibility for the length of time that the accounts for material were overdue, or for their ultimate collection.[5]

---

[1] D.A.O./Misc./1260/1. Special cases were brought forward in practically every instance by the Metropolitan Munitions Committee, whose contractors refused to accept compensation on the standard terms offered, declaring them to be totally inadequate. Acting on legal advice the Ministry settled these cases by compromise.

[2] D.A.O./Misc./1251, 1394; D.A.O./Bds./26; D.A.O./F./1; Sir James Stevenson's Unregistered Papers, 106 b; HIST. REC./R./450/17; Minutes of Board of Management Executive Committee.

[3] In the early stages it not infrequently happened that, owing to the large percentages failing to meet the inspection requirements, the payment on account exceeded the contractors' bill, and the next payment to the contractor was debited with the difference.

[4] See above, p. 39.

[5] D.A.O./Misc./1394. The Board suggested as a remedy that they should be authorised to collect all monies owing by contractors for materials as soon as accounts became due.

The unsatisfactory state of the accounts relating to materials supplied (both as regarded direct contractors as well as Boards of Management), was already occupying the Ministry at this time, and it was decided in June, 1917, that henceforward contractors should make payment for their material direct to Boards, who should be kept strictly informed of the material sent to their contractors. A further simplification was made at the same time; hitherto, both the Ministry and the Boards had each kept accounts with individual contractors, entailing the keeping of nearly 2,000 contract accounts at headquarters and an unnecessary duplication of work. It was, therefore, decided that the Boards should become responsible for the detailed accounts with their contractors, while the Ministry should keep one account with each committee, thus reducing the number of accounts from about 2,000 to 20.

The net result of these changes was that a Board now made all payments to and received all payments for material from their contractors, maintaining for the purpose two control accounts with the Ministry, one for materials delivered to the contractors and the other for stores and components supplied to the Ministry.

The new procedure was put into force generally as from 30 June, 1917, though in a few cases it was delayed till a month or so later. The reconciliation of accounts of the Ministry and the Boards, however, which was a necessary step in decentralisation, involved the examination in all of about 18,000 accounts and was the work of many months. In January, 1918, the reconciliation had been effected for six Boards, and five more were on the point of completion. The records of Boards were reported to have been, with an occasional exception, well kept, and the chief cause of delay remained the lack of proper record at the Ministry of materials received by certain contractors.[1] A contributory difficulty in the case of Boards paid by imprest and controlling both National Shell Factories and Groups was that materials had often been charged for at Ministry of Munitions standard rate, but taken on charge by the Boards at contract rate.

In March, 1918, further changes were introduced which served to place the accounts both of the Ministry with the Boards and the Boards with their contractors on a cash basis. In the first place, it was decided to abolish wherever possible the 80 per cent. advances to contractors and defer the payment until the accounts could be discharged in full.[2] Secondly, it was settled that materials accounts, as between the Ministry and the Boards of Management, should in future be settled on a cash basis and not by deduction, and that free issues of materials should no longer be given to contractors.[3] It was necessary

[1] The contractors themselves sometimes raised difficulties; at Manchester one or two firms refused to fill in the necessary forms, and it became necessary for the Ministry to send accountants to their works for the purpose of getting the required information.

[2] In certain cases (*e.g.*, Manchester) this did not prove to be feasible and the Board was allowed to retain the old rule.

[3] This eliminated all the trouble of accounting for material *per contra*.

in order to carry out these changes that the Boards should be supplied by the Ministry with working capital.[1]

In May, 1918, the Finance Department were able to report that the accounts with local committees and Boards of Management for current records were well up to date, and that the mistakes of the past were not likely to recur. One of the results of the new system was that contractors worked with considerably reduced stock, the contractors to the Leicester Board, for example, having reduced running expenses of over £160,000 to £70,000.

(*e*) The Reduction in the Price of Shell.[2]

The prices offered to local groups by the Armaments Output Committee were based on the terms hitherto paid to armament firms, and were up to £4 10s. each for 6 in. shell, £3 for 4·5 in., 23s. for 18-pdr. H.E., and 12s. 6d. for fuses. These terms (which were also offered to direct contractors) were admittedly liberal in order to encourage manufacturers to take up the work.[3] They were quoted widely as standard prices throughout the country, and the natural tendency was for the maximum price to become the only one. As a matter of fact, this was not entirely so in the case of Co-operative Groups, whose first contracts were mainly divided between the machining of 4·5 in. H.E. and 18-pdr. H.E. shell. With one exception,[4] the Board's contractors obtained the maximum price for 4·5 in., but subject either to revision or a reduction in price after a fixed date. In the same way three Boards (Birmingham, Bury and Manchester) were given 23s. for 18-pdr. shell, but the majority of orders were placed at 22s. for the first 20,000 and 20s. for the balance of the contract.[5] The formal agreements between the Boards and the Ministry gave in general December, 1915, or the beginning of 1916 for the termination of these first contracts with the Ministry.

The question of reducing prices was a general one, but it is reckoned not the least of the services rendered by local organisation that it was largely solved by its special application to Boards of Management. It was in the first instance the Boards of National Shell Factories whose cost returns, from November, 1915, onwards, furnished

---

[1] The amount varied according to the turnover of the Board; Manchester had £500,000 afterwards increased to £796,000, Aberdeen had £80,000, Edinburgh had £20,000.

[2] D.A.O./7b/535, 2045; D.A.O./Misc./238,1394; Hist. Rec./R./500/63; Hist. Rec./H./1121·22/6, 1121·24/4; D.A.O./C./1, 2, 3, 4, 6, 8, 11, 17, 24, 28; (Printed) *Weekly Report*, 64, III. (21.10.16), 76, III. (13.1.17), Hist. Rec./R./1121/29.

[3] On 28 July, 1915, at a representative meeting at Bedford of engineers from five counties, which was reported in the local press, Mr. W. H. Allen said the War Office had been generous as to prices, and none need fear to lose.

[4] The Metropolitan Munitions Committee, which placed an early contract for 4·5-in. H.E. at £2 10s.

[5] At Coventry, on the suggestion of the contractors themselves, the price was placed as low as 18s., but on revision was raised to £1.

ample evidence not only of the necessity for reduction (which was very generally recognised)[1] but also of the scale on which it might be conceived.[2]

The action taken in conjunction with Boards of Co-operative Groups had even more practical results. Towards the close of November, 1915, all Boards were informed that the prices of shell and other gun ammunition components were about to be revised and no contracts should be placed or extended without consulting the Ministry as to price and quantities. Several Boards were interviewed by the Ministry at the beginning of December and were asked to obtain figures showing their contractors' costs and to make suggestions for revised prices. The East Anglian Board in particular, whose co-operative organisation was noticeably good, was invited to submit proposals and responded by an offer to take a contract for 150,000 18-pdr. H.E. shell at 12s. 6d., which the Board considered to be " a fair commercial price, provided all capital expenditure had been written off on previous contracts and that the manufacturer had suitable machinery."[3] Revised offers from other Boards ranged from £1 to 15s. 6d., the variation in price being largely due to difference in equipment. Particulars of costs for the heavier shell were more difficult to obtain, as very few contractors were sufficiently advanced in manufacture.

All the required facts were " ungrudgingly placed before the Ministry "[4] by the Boards who were consulted, but at the same time there was a general expression of opinion that contractors had suffered so many delays, for which they could not be considered responsible,

[1] In September, 1915, the Contracts Branch had warned Boards of certain reductions which would take place either on the completion of first orders or, in the case of repeat orders, after 31 March, 1916. The maximum prices would then be £4 7s. 6d. for 6-in., £2 14s. or £2 16s. for 4·5-in., 18s. or 19s. for 18-pdr. H.E. and 11s. or 11s. 6d. for fuses (D.A.O./C./1 Schedule 2).

[2] The cost returns about this time were as follows :—

Type of Shell.	Factory.	Cost Returns.		
		Nov.	Dec.	Jan.
		s. d.	s. d.	s. d.
18-pdr. ..	Keighley	9 1	8 10	9 1
,, ..	Dundee	—	10 2	9 1
,, ..	Uskside	13 1	13 0	—
,, ..	Huddersfield	13 2	13 2	13 11
,, ..	Liverpool (Haymarket) ..	14 7	12 11	—
,, ..	Ebbw Vale	17 7	20 2	—
,, ..	Swansea	—	—	17 11
4·5-in. ..	Leeds	44 3	36 2	39 10
,, ..	Bradford	—	36 2	39 10

[3] The whole of this order was placed with and carried out by one firm who was represented on the Board and was anxious to prove the Board's contention that shell could be commercially manufactured at the price.

[4] D.A.O./C./4.

that they had been prevented from taking full advantage of the prices originally offered by the Ministry to cover the initial development expenses.

It was evident that, though there was general need of reduction, the conditions under which shell was being manufactured were unequal and very few contractors were yet in a position to produce economically. The Ministry now decided to abolish the principle of a maximum price and adopted instead a sliding scale based on capacity, which not only provided an equitable basis for contracts but also enabled manufacturers to contribute their share according to their capacity. At the same time the claim of contractors for consideration on account of unavoidable delays was liberally recognised by the Ministry, who granted an extension of time either at the old or slightly reduced terms as occasion merited.

The price under the new scale for 18-pdr. H.E. shell was 16s. where the promised maximum output was 200 weekly, decreasing automatically to 14s. as the output rose to 2,000, any number in excess of which was a subject of special negotiation. The price for 4·5 in. was 48s. (Mark VI), or 46s. (Mark V), on a weekly output of 200, decreasing to 41s. (Mark VI), or 39s. (Mark V), on an output of 1,500.

This was the first of a series of progressive reductions in price, which, as knowledge increased and methods improved, were applied to every store and component manufactured by Boards' contractors. The last scale, issued in January, 1918, "to hold force until further notice," furnishes an interesting commentary on the results of the three preceding years. The price for a weekly output of 5,000 18-pdr. H.E. shell or under was 12s. each, for 10,000 11s. 9d., and over that number 11s. The price of 4·5 in. H.E. was for a weekly output of 500 or under 33s. (Mark IX), and 33s. 6d. (Mark X), for 2,000 or under 29s. 6d. (Mark IX), and 30s. (Mark X).

The opinion of the prices paid by the Ministry, given by one of the foremost Boards, whose operations were on a very large scale, may here be quoted :—

> "Notwithstanding the continued advances in wages, the Ministry's reductions and ultimate prices were not only justified but enabled those contractors who went in for production seriously and on a large scale, to secure a fairly generous return."[1]

III. The Work of Boards administering National Shell Factories.[2]

(*a*) The Early Equipment of Factories.

The selection of suitable factory premises formed a very important part of the voluntary work of Boards of Management. Urgency was the essence of their early work and, save in a few isolated instances

[1] D.A.O./Misc./1394.

[2] D.A.O./Misc./30, 238, 418; D.A.O./4/524; D.A.O./3/717; HIST.REC./R./1121/29, 46, 47, 48; D.A.O./5/22, and accounts of Boards of National Shell Factories contained in Chapters VII—XIV. Further details of the work of the factories will be found in Vol. VIII, Part II, Chap. III.

(and those of a later date) existing premises were adapted to the purposes of shell making. In this way buildings of a totally unexpected character—as for example an old herring curing factory, a malt house, a toy factory, a jute mill, a garage, a roofed market, a weaving shed, a rifle drill hall— have served their turn as National Shell Factories. Railway engine sheds and repairing shops were successfully adapted and the corporations of various towns also placed premises in their tramways and electricity departments at the disposal of the local Board. In some instances, engineering firms would offer shops in their own works, following in this the initial example of the Leeds Forge Company, which furnished the site for the first of the Leeds National Factories. In these cases the firm was represented on the Board of Management.

Local patriotism, either of individuals or corporate bodies, in many cases took the form of lending the required premises rent free for the duration of the war. The factories at Bacup, Dundee, Llanelly, Portmadoc, Swansea and West Cumberland were lent by private persons or firms while Bury, Chester, Liverpool, Manchester and Wrexham Corporations all provided sites free of rent. In other cases a nominal rent only was taken, as for example at Barnsley, where the owner of the factory charged a rent of £150, barely covering taxes, where a fair rental would have been £700 per annum.

Many of these buildings were not primarily intended for engineering purposes and very often considerable alterations and extensions were carried out, while in a few cases entirely new buildings were put up under the direct supervision of the Boards.

The second task accomplished by Boards of Management was the equipment of the factories with machinery. The earliest efforts of the local committees had everywhere been to prepare some sort of census of surplus machinery in the district available for munitions work. Under their agreements with the Ministry the Boards were empowered to hire or purchase this machinery. The general arrangement for hiring was that a Board paid 1½ per cent. per month on the agreed value (based on the original cost) of the machine at the time for hiring. Some Boards, however, preferred to purchase second-hand machines and avoid later questions of depreciation.

The policy of the Boards was to instal plant as quickly as possible, but the most readily obtainable was not always the most suitable, and there were many early complaints of hindrances caused by the breakdown of second-hand machinery. The hire or purchase of local second-hand machinery must be regarded, however, as an early stage in the equipment of factories, which as they expanded their work or changed its character, received large additions of new machinery at the Ministry's expense: thus, the Haymarket, Liverpool, National Shell Factory, beginning with a "loan collection" of some 60 machines, had, at the time of closing down, 350. Some small factories remained stationary. Portmadoc, for example, never exceeded an equipment of 23 lathes, of which four only were provided by the Ministry.

(*b*) The Work undertaken in National Shell Factories.

The exhibition of sample shells arranged in March, 1915, to be held at the various centres for the information of intending contractors, had been confined to 18-pdr., 4·5 in. H.E., and 6 in. H.E. shell, and No. 100 fuse; of these the 4·5 in. and the 18-pdr. represented the most urgent need of the War Office at the moment. Mainly for this reason, but partly also because available machinery was best adapted for it, the greater number of the early National Shell Factories took up the manufacture of 4·5 in. or 18-pdr. shell,[1] though subsequently almost every type up to 9·2 was produced in one or other of the factories, in addition to fuses and gauges.

The work of the National Shell Factories was modified or developed by the exigency of the shell programme, and this more particularly in the case of the large number of factories manufacturing 18-pdr. H.E. shell, which, owing to the glut of that shell, were turned over in the summer of 1916 to other work, only to be turned back again at the close of the year. Again, in the autumn of 1917, when there was an urgent necessity to increase the output of 6-in. shell, arrangements were made for certain Boards to set up new factories for this type of shell. Advantage was also taken of the fact that not only were the Shell Factories national property, but also that their administration was more directly under the immediate control of the Ministry than other national factories, to turn them over to the supply of temporary needs, such as the manufacture of proof shot or the rectification of shell.

When a Board of Management controlled both a National Shell Factory and a Co-operative Group, it was quite usual for the factory to undertake certain finishing processes for contractors' shell; one factory indeed (Bristol) confined its work entirely to collecting, banding and varnishing shell produced by the West of England group of contractors.

---

[1] Hence there arose in the early days of the Ministry an artificial classification of national factories under which National Shell Factories were supposed to be limited to shell under 6-in., while 6-in. shell and upwards were the work of the National Projectile Factories.

CHAPTER VI.

SUMMARY.

The foregoing chapters have shown that the scheme of local organisation for the manufacture of munitions in the United Kingdom, as carried out under the Ministry of Munitions, differed widely from the ideal of decentralisation originally planned by the Armaments Output Committee. Under the latter scheme the Boards of Management were to enjoy, in their several districts, a local autonomy which never eventuated under the new dispensation; the Armaments Output Committee was simply there to act as intermediary, to arrange the Boards' contracts with the War Office and help them over the early difficulties of manufacture.

This subjection of the committee's functions in relation to local Boards was indeed envisaged by Mr. Lloyd George, as shown in his speech of 23 June, 1915, introducing the Munitions of War Bill. Every district, he said, must undertake to do the work for itself, for time would not allow the organisation of a central department sufficiently strong and sufficiently well equipped to make the most of local resources. The new central department was, however, to expand in a manner as unforeseen as it was rapid, and this alone must have reversed the balance of power as originally designed even had not other circumstances tended to restrict the powers of the Boards. Briefly, the principle of decentralisation was retained by the Ministry, but was now applied to the setting up of yet another form of local organisation —the Area Offices.

It has been shown that the Boards did not submit without protest to the consequent diminution of the powers originally allotted to them and did secure a certain independence of the Area Offices, so that the two forms of organisation continued to exist side by side, allied to one another and yet mutually independent.[1] As time went on, too, the tendency was to increase the scope of the Boards' work (for which they perpetually agitated) without, however, fundamentally altering their position.

---

[1] Sir James Stevenson has expressed his ultimate opinion of the value of Boards as units of organisation in war time. "I would do exactly the same again if the outside resources of the country required to be harnessed to armaments supply. One change I would make, namely, that the Secretary of each Board should be an individual appointed, controlled and paid by the Department of the Government administering the organisation. The extent to which they should be utilised would be easily settled if the main organisation of the Department had reached the stage it had arrived at in the last year of the war, where one Council Member was responsible for the entire field of ammunition." (Hist. Rec./R./1121/47.)

Meanwhile, the organisation into Areas, while cutting across the activities of Boards of Management, had itself fallen short of the original idea of decentralisation, by which each Area was controlled by one supreme official. Instead, the offices became the local headquarters of officials more or less independent of each other, resulting in general lack of co-ordination of work. How far this departure from the original purpose of the Director of Area Organisation detracted from the scope of the Area Officer's work is shown in the isolated cases where the scheme was carried out as first intended, as, for example, in Scotland, where a Director of Munitions was appointed, who assumed command of the whole activities of the Ministry in the Area with complete success. The attempts made to co-ordinate the work of the numerous officials attached to offices culminated in 1918 in the election of one chief representative in the Area for the Department of Engineering and marked the increasing tendency to recur to the early idea of centralised local control.

The Boards did not get into working order until some months after the formation of the new Ministry, and it was not until the close of the year that production on a small scale became general, and in many cases, for one reason or another, it was delayed till well into 1916. The production of the empty shell continued to preoccupy the Boards. The estimates formed of maximum capacity in the first instance were almost invariably exceeded. Thus, taking as examples the two pioneer schemes, the Leicester Group, which undertook to turn out from 500 to 1,000 4·5-in. shells weekly, was producing 8,000 at the time of the Armistice; while the original factory undertaken by the Leeds Board was supplemented by five others, and a million and a half of shell, the major number of which ranged between 6-in. and 15-in., were turned out. In spite of the comparatively simple nature of trench warfare stores, the Boards' contractors did not specialise in their production, largely owing to the fact that the Trench Warfare Supply Department had also its own form of local organisation, which cut across the Boards' work. Next to shell itself, the Boards were chiefly concerned with the output of components and, particularly, fuses, the need for which was particularly emphasised in June, 1915. The jewellers and light metal workers of Birmingham, the silversmiths and cutlers of Sheffield, were all drawn into the manufacture of fuse parts, which were subsequently assembled in factories controlled by the Boards in those districts. Contracts on a large scale for these and other components were also carried out under the supervision of various Boards, while the surplus capacity of the small contractors was everywhere turned on to components. The net result of the Boards' activities was that of a total home production of 162,708,100 empty shells, the National Shell Factories and Groups produced 64,376,900, or approximately 39½ per cent. of the shell made in this country during the war, with a corresponding proportion of components.

It has been shown that the Board of Management of a National Shell Factory and the Board of Management of a Group differed essentially. The work of Boards of Management of National Shell Factories

retained to the end somewhat of an emergency character. In the beginning they helped to fill in the gap during the latter half of 1915 and the beginning of 1916, while the National Projectile Factories, huge buildings on the most modern lines, were being put up, and later they were often turned aside from their usual work to meet some special exigency of the munitions programme. Many of the factories were started by using miscellaneous machine tools obtained in the locality, and only when these were replaced later by modern plant could the results be compared to ordinary commercial undertakings.

The Boards of Groups had in some respects a wider scope for their work. Their early achievement was to bring into the manufacture of munitions the small engineering firm, which difficulties of inspection alone would have otherwise made it impossible to make use of. The range was extended later to include every conceivable branch of industry, and manufacturers of such diverse wares as biscuits, cutlery, lace, tobacco, silver goods, jewellery and paper bags, all figured as Board of Management contractors. But, above all, the Boards stood in the position of a buffer between the Ministry of Munitions and contractors generally. They solved countless cases of difficulty locally, which, if they had been dealt with centrally, would have placed a very great strain on the Department, and they constantly impressed upon the contractors the necessity of bearing with patience the various changes of design, the alterations in the type of shell to be manufactured and—what was perhaps the greatest difficulty of all—the shortage of material which the emergencies of the war had made it impossible to avoid. While their contractors quite early began to look on the manufacture of shell as a business proposition, the Boards' work never lost its honorary character, and they continued to devote an enormous time to the service of the country entirely without remuneration. As has been shown in the preceding pages the tendency was for the responsibilities to increase rather than to diminish, as exampled by the opening up of fresh fields of work for their contractors at the close of 1917.

No two Boards of Management can be said to have been identical in their development; each Board had its own special questions to solve. Thus the West of England Board, which operated over an area embracing nine counties and employed upwards of sixty contractors on their 18-pdr. scheme, were confronted with an entirely different problem to that of the Hull Board, whose important scheme for 4·5-in. shell was carried out by eight firms practically within the limits of the town itself. The question of environment, too, was an equally strong factor in individual development. There was a wide difference between the working conditions of those Boards organising straggling agricultural districts and those exploiting the resources of important industrial centres. Nor did Boards in the best-equipped districts by any means always carry out the largest schemes. The Manchester Board, it is true, carried through successful operations on so large a scale as to approximate more closely perhaps than any other Board to the original intention of the movement. The Coventry Board, on

the other hand, operating also in an engineering district almost entirely given over to the production of munitions, was responsible for a comparatively small output of shell; the value of the latter's work lay in its educational character.

Enough has been said to show that it is not possible to generalise on the individual achievements of the Boards of Management, and the remaining chapters of this part are accordingly devoted to an examination of the conditions under which the work of each separate Board was carried out.[1]

[1] For the National Shell Factories see also Vol. VIII, Part II, Chap. III.

LOCAL BOARDS OF MANAGEMENT.

CHAPTER VII.

THE NORTH-EASTERN BOARDS (AREA 1).

I. The Grimsby Board of Management.[1]

Pre-war conditions in Grimsby were, it might have been assumed, on the whole unfavourable to the scheme for the increased output of shell which was carried out with such conspicuous success in the district. The town's claims to importance lay in its suitability as a station for the North Sea fishing fleet, its large docks, and its direct trade with the continent. Such engineering industry as was carried on was chiefly connected with shipbuilding or repairs. The immediate effect of the war was, it is true, so far favourable to any new scheme in that labour became plentiful, mainly owing to the laying up or requisitioning of the fishing boats. In March, 1915, it was stated that there were "hundreds of men hanging about the docks who have not had a full week's work since the War."[2]

In April, 1915, the Mayor of Grimsby approached the Engineering Employers' Federation as to the feasibility of forming a munitions group in the town, but the central authorities then considered that, having regard to existing uncertainties, action should be delayed. The following month, however, a conference of the various engineering firms in Grimsby was held and a committee was appointed to organise and obtain information, and both the War Office and Admiralty were approached with offers of help. On 19 May a reply was sent from the former Department, setting forth the two proposed schemes (national factories and co-operative groups) on which they were then working and pointing out the minimum quantity of shell which the Government would accept. The Grimsby Committee, of which the Mayor was a prominent member and the Town Clerk honorary secretary, henceforward devoted its attention to the setting up of a national factory.

On 12 July, 1915, a deputation representing the proposed Board of Management was interviewed at the Ministry. Their plans for a factory to manufacture 6-in. shell were well advanced: a works manager had been appointed, premises chosen, and various works where shell-making was in progress had been visited for purposes of observation; moreover, the proposed Board had already purchased some 75 lathes on their own initiative. Nothing was needed except the official authorisation to proceed.

This was delayed for a short time while an attempt was made to unite under one management this scheme and another for co-operative

[1] Hist. Rec./H./1121·21/3. For further details of the National Shell Factory see Vol. VIII, Part II.

[2] Letter, dated 14 March, 1915, from the Secretary of the Grimsby Trades and Labour Council to Lord Kitchener, filed in D.A.O./1/514.

work organised by certain Grimsby firms. Representatives of these firms (who were already acting as sub-contractors for shell to the armament firms) had not been elected to the Mayor's committee, and they now wished to set up their own scheme with an independent Board of Management. The local members of Parliament—Timothy Davies and T. G. Tickler—interested themselves in the matter, but after some discussion it was recognised that the union of the two schemes was impracticable. As no Munitions Committee had been formally appointed, the Department of Area Organisation now regularised the position by summoning a meeting for the purpose at Grimsby on 11 August, 1915, when Mr. McLaren took the chair. A committee was then elected, composed of 18 employers, of whom each group nominated nine, and nine labour members. The two Boards were then selected from the committee and received Ministerial approval on 19 August. A Labour Advisory Board was set up at the same time.

The Board of the Co-operative Group never succeeded in taking a contract and their later history may be dismissed in a few words. It had been laid down by the Ministry that the group (which consisted mainly of one firm, the Great Central Co-operative Engineering and Ship Repairing Company) should not receive a contract until existing sub-contracts for 4.5-in. shell had been carried out. In January, 1916, the Chairman approached the Ministry for a contract for 500 shells a week as from March, 1916, but the revised prices decided the group not to apply for it. The Board made no further effort to work direct for the Ministry, though it was not dissolved until 1917.

The work of the Board of Management of the National Shell Factory[1] was attended with uniform success, in spite of certain drawbacks. Extensive alterations had to be made to the premises chosen, an old two-storeyed building formerly used as a herring-curing factory, but even so the building remained in many ways inconvenient, the lay-out of the plant was congested, while the low ceiling and narrow gangways made it impossible to fit modern lifting appliances. The inconvenience became acute when the employment of women in the factory was under consideration and, combined with the heavy manual labour entailed in the manufacture of 6-in. shell, delayed the required 80 per cent. of dilution until June, 1917, despite the Board's best efforts.

Under their agreement the Board undertook to begin with an output of from 250 to 1,000 shells, working up to a larger figure as quickly as possible if required. On 4 December, 1915, the first 250 shells were delivered into bond, and in January, 1916, the weekly output was 700 shells. The maximum capacity of the factory was originally estimated at 1,800, but this number was soon outdistanced, and during 1917 output rose to over 3,000 shells a week.[2]

Various questions relating to wages, which were very high locally, arose from time to time and were settled in consultation with the Labour

[1] For the personnel of the Board see Appendix IV.
[2] The output of the Board is shown in Appendix V.

Advisory Board, with whom the Board maintained close and friendly relations throughout. At the beginning of 1916 the factory employees agitated for a piece-rate, but eventually accepted a bonus on output scheme, which placed their wages on a high scale, while it did not debar them from the various rises under the awards of the Committee on Production.[1] The effect on output of this bonus, too, was of the best.

It might have been expected that the high cost of labour, combined with old-fashioned appliances, would have resulted in high cost of production, but here, too, the Board passed the test of efficiency. During 1916, a period when their work was still to some extent in the experimental stage, the cost returns in January, 1916, were 68s. 10d. and in December 56s. 5d., the schedule price for contractors at the same date being £4 10s. and £3 8s. respectively.

II. Hull Board of Management.[2]

The co-operative scheme at Hull may be considered a direct outcome of that originated at Leicester, where representatives from Hull at different times attended meetings and were otherwise given information. The movement was at the same time marked by very strong local enthusiasm.

In the spring of 1915, Hull engineering firms were very busy, not only with private work but with a certain amount of sub-contracting for the War Office. Various firms also were under contract to the Admiralty who, in the event of a naval action, had a lien on their services. In spite of this it was estimated that surplus capacity remained which could be turned on to shells. Both the Labour Exchange and the Chamber of Commerce took separate action towards the end of March, combining forces to convene a meeting of engineering firms at Hull on 21 April, 1915. Forty engineers from Hull and Beverley were present at this meeting, whose keynote was a patriotic desire to supply the urgent need of the War Office although, as was pointed out by the Lord Mayor, there was a strong incentive to adopt a plan which would utilise locally all skilled mechanical labour and prevent its diversion to other towns.

The outcome of this meeting was the appointment of a committee to work out and submit to the War Office definite proposals with a view to a direct contract being placed with Hull.

Investigation showed that about 98 lathes, which could be worked night and day, could be turned on to shell, while one firm, Messrs. Rose, Downe and Thompson, had hydraulic presses suitable for the production of forgings. On the strength of this, members of the Hull Committee visited the Armaments Output Committee prepared with an offer to manufacture either 18-pdr. H.E. or 4·5 in. H.E. shells,

[1] The bonus was based on a maximum weekly output of 1,800 whereas the factory attained to over 3,000 ; for the four weeks ending 2 May, 1917, it amounted to 12s. 1·05d. per £ on wages and salaries, and for the preceding four weeks 16s. 6·7d.

[2] HIST. REC./H./1121·21/1 ; D.A.O./1/172, 218, 245, 425, 426.

beginning with an output of about 2,000 shells a week. The Armaments Output Committee, while not ignoring the claims of the smaller areas, was at this time concentrating on the organisation of those large areas capable of turning out the largest number of shells a week, and the consequence was that the deputation, who resented the suggestion of incorporation with the larger area of Leeds, came away from the conference with their enthusiasm chilled, and suggested to the Hull Committee on their return the advisability of proceeding with their ordinary business. This attitude was maintained in the committee's subsequent correspondence with the War Office, but Mr. Booth maintained that, while the importance of Hull's offer was by no means belittled, attention at headquarters must first be concentrated on such large engineering centres as Leeds (where a weekly output of 40,000 shell was under negotiation), and the Hull Committee finally wrote that they appreciated the position and would await the convenience of the Armaments Output Committee.

The delay was not of long duration for on 17 May the Hull deputation was once more interviewed at the War Office and the following day the chairman of the committee was instructed to appoint a Board of Management[1], which was authorised to proceed with a scheme on 31 May. Hull had by this time decided on co-operative work and under the agreement with the Ministry, which was signed in June, 1915, they contracted to supply 40,000 4·5 in. H.E., or as many more as could be supplied by 31 December, 1915, by working up to 5,000 a week; delivery was to begin at the rate of 2,000 a week within eight weeks from the receipt of the order. The group was an assisted one and received a preliminary advance of £5,000 free of interest, which was subsequently repaid.

The same delays in production occurred here as elsewhere, but by the beginning of September, 1915, several thousands of shell were partly machined and awaiting inspection gauges. A further delay was caused later by change of mark, so that it was not until January, 1916, that shell began to be delivered in regular quantities, although many thousand shell were in various stages of completion. The contract was finished in February, 1916, and was renewed for the same type of shell, which was still being manufactured in November, 1918, the output then having reached a maximum of 8,000 shell weekly.

The 4·5 in. shell was manufactured by a group of eight contractors, most of whom had been members of the Hull Committee, whose work they carried on.[2] Their work was carried out on co-operative lines, certain operations being done in a warehouse common to and run at the expense of the whole group.

In addition to 4·5 in. shell, a few contracts were placed locally by the Hull Board of Management for 6 in. chemical shell and various components, but the value of the Board's work consists chiefly in its contribution of 4·5 in. H.E. shell to the general output.[3]

---

[1] For the personnel of the Board see Appendix IV.
[2] See above, p. 55.
[3] For details of output see Appendix V.

III. The Tees-Side Board of Management.[1]

The North-East Coast Armaments Committee, composed of three elements equally represented—Government officials, employers and labour—had been formed in April, 1915, and was mainly concerned with the supply of labour to existing armament firms.[2] This avowed object tended to arouse distrust and even resentment in the minds of local manufacturers, who were naturally anxious rather to employ their surplus capacity on the manufacture of munitions than to see their skilled labour drafted elsewhere.

It certainly was not a suitable committee for arranging for the distribution of orders for shell, and early in June, therefore, the Ministry began to consider the possibility of forming Boards of Management for the Tees-side and Tyne and Wear districts respectively, composed of practical engineers who should be subject to the North-East Coast Armaments Committee on matters of general policy.

Mr. Ridley, of Messrs. Thomas Ridley & Sons, Middlesbrough, had long been attempting to organise the Tees-side along independent lines. Between April and June he was in constant communication with the Armaments Output Committee and afterwards the new Ministry, urging on every occasion the formation of a committee for the Tees-side towns, which were receiving no help from the North-East Coast Armaments Committee but the contrary. Complaints from Stockton and Middlesbrough bore out his statements. One Stockton firm under contract for 50,000 18-pdrs. wrote that they had applied to the committee in vain for labour, though suitable men were being actually transferred from the town to Newcastle. The Mayor of Middlesbrough also complained to the Minister of Munitions that work there was being much dislocated by the transfer of men for Admiralty work in the Tyne district. A more moderate view, expressed by the representative of a Darlington firm in an interview with Sir Percy Girouard on 24 June, was that all the big works were already engaged to a steadily increasing extent on Government work, though a reorganisation might divert a little labour to work more immediately necessary.

As a result of this last interview the Ministry decided to postpone the question, but on further representations by Mr. Ridley they agreed to the formation of a small committee representative of Tees-side and Darlington, which should confer with the North-East Coast Armaments Committee but submit propositions to the Department. This committee was elected at a largely attended meeting of the Cleveland Ironmasters' Association on 30 June, 1915.

The committee were now to find how very limited were the resources for shell-making of a neighbourhood largely given over to the manufacture of raw material, and but for the very strong desire of masters and workmen alike to be directly at work on a tangible form of munitions, the scheme might well have fallen through.

---

[1] D.A.O./1/10, 134, 561 ; D.A.O./Misc./1394 ; HIST. REC./R/1121/29.

[2] A detailed history of the North-East Coast Armaments Committee will be found in Vol. I, Part III, Appendix 14.

On 9 July the committee put forward a co-operative scheme for 18-pdr. shell or its equivalent, which ultimately aimed at a maximum output of 5,000 shell a week, but the Ministry was not prepared to consider a proposal starting at less than 5,000. At this stage, owing to the tremendous shortage of machines and ordinary tools, the Tees-side manufacturers were asked to give up the idea of shell and use all their available surplus capacity to manufacture lathes. They agreed, and investigations carried out by the Machine Tool Department of the Ministry led to two contracts being placed for machine tools. No other firms were declared likely to be of assistance as far as machine tools were concerned, and once more the committee pressed for a small shell contract to employ such surplus capacity as was known to be available in the repair shops attached to the large foundries.

Under these circumstances the Department prepared once more to consider the Tees-side Committee's offer of shell, and on 19 August informed them that a small Board of Management might be formed to control the manufacture of 18-pdr. shrapnel by local firms, provided that no existing contracts were interfered with. A Board was accordingly nominated by the committee and received official sanction on 13 September, 1915.[1] Its chairman was Mr. Ridley, whose firm had had experience in manufacturing 18-pdr. shrapnel, and now in compliance with the Ministry's special request undertook to supervise the co-operative contract. Under a contract signed between the Ministry and the Board on 2 November, 1915, the Board undertook the manufacture of 1,200 18-pdr. shrapnel a week, increasing as rapidly as possible to 3,000.

A few contracts for proof shot and small components were subsequently placed by the Board, but 18-pdr. shrapnel remained its staple product. The contract was divided among seven contractors and the output eventually rose to over 7,000 a week.[2]

The Board's estimate of their own work is a just one: comparatively insignificant as was their output in mere numbers, its real value was that it served to satisfy the "uneasy and restless" craving of the workmen to do their share in the production of shell.[3]

IV. The Tyne and Wear Board of Management.[4]

The circumstances under which it was decided to form Boards of Management within the area controlled by the North-East Coast Armaments Committee have already been indicated under the Tees-side Board of Management.[5] In the beginning of August, 1915, the Ministry began to take active steps towards the formation of a second Board (to administer the Tyne and Wear district) and in particular obtained the consent of Sir Charles Parsons and of Mr. Summers Hunter (a prominent member of the North-East Coast Committee) to serve. On 10 August a letter was addressed to the Lord Mayor of Newcastle, in

[1] For the personnel of the Board see Appendix IV.
[2] See also Appendix V.
[3] D.A.O./Misc./1394.
[4] D.A.O./1/32, 57, 74, 85, 111, 130, 558; D.A.O./Misc./1394; HIST. REC./R./1121/29.
[5] See above, p. 57.

his capacity of President of the committee, informing him of the proposed establishment of a Board of Management and also of a Labour Advisory Board, and pointing out that the executive functions of the committee thereby ceased. The committee thus became purely advisory, and was very shortly after dissolved.

On 13 September, 1915, the Tyne and Wear Board of Management was approved by the Ministry;[1] the district over which it operated was Northumberland and Durham, exclusive of Stockton and Darlington, but inclusive of the Hartlepools, which had at one time wished to organise separately. Under an agreement embodied in a letter from the Director of Area Organisation on 23 September, the Board was authorised to distribute orders within their area at maximum prices scheduled by the department. A loan—for which the Board acted as trustee—of £20,000 at 5 per cent. was made by the Government, otherwise no financial responsibility was incurred.

It was not likely that the Board, situated as it was within the zone of the great armament firms, could accomplish much in the way of shells. The Ministry was anxious that this Board, like the Tees-side, should endeavour to turn all surplus capacity on to machine tools (for which local machinery was presumably better adapted) rather than to the more problematic manufacture of shell. The question occupied the early energies of the Board and more particularly of one member, Mr. Noble, whose firm, acting at first in close co-operation with the Board, but later working independently for the Machine Tool Department, carried out a series of contracts for machine tools.

In spite of its handicap, the Board succeeded in placing individual contracts for various types of shell.[2] The deliveries promised have in no case exceeded 1,000 a week, and were generally considerably under that figure; for instance, under contracts for 4·5 in. shell—the most successful venture in point of numbers—the deliveries of six contractors ranged between 500 and 200 shell each. The lower number was produced, it is interesting to note, by the Tees-side Co-operative Munitions, a group consisting of six small firms or garages, who distributed the work among them.

The main work of the Board must be considered the initiation of the West Hartlepool National Factory for 8-in. shell. The scheme occupied the Board from the beginning, but it was not until November, 1915, that they were able to lay a definite scheme before the Ministry for a factory to produce 1,400 8-in. shell a week. Premises were to be rented from the Central Marine Engine Works, who were to manage the proposed factory at a given salary plus a bonus on every shell. After a revision of the terms, which were considered too high, the Ministry agreed to the scheme, and clauses authorising the Board to proceed were on 22 December, 1915, embodied in their original agreement with the Ministry. The actual management of the factory was thus taken out of the Board's hands, but ultimate responsibility rested with them until in December, 1917, with the decision of the Ministry to hand over the factory to the Admiralty as a boiler shop, it finally ceased.

[1] For the personnel of the Board see Appendix IV.
[2] The numbers of shell delivered by the Board are set out in Appendix V.

CHAPTER VIII.

THE NORTH-WESTERN BOARDS (AREA II).

I. Blackburn Board of Management.[1]

At the meeting held by Mr. Lloyd George at Manchester on 3 June, 1915, it was agreed that Blackburn should form the headquarters for North Lancashire, the third of the groups into which it was then decided to divide Lancashire.

In addition to the manufacture of looms for the weaving of Government cloth, a certain amount of munition work was already being done at this date in Blackburn and its immediate neighbourhood on sub-contracts for Messrs. Vickers and other armament firms. One or two big engineering firms were also working on guns and machine tools. Considerable resources, however, were still untouched, and there had been for several months evidence of a strong desire among both employers and employed to be doing more.

The first definite steps towards organisation were taken by the Blackburn municipal authorities. As the result of a conference held on 29 April, at which the munitions situation was discussed, a report drawn up by the City Electrical Engineer was sent to the Local Government Board, whose representative had recently visited Blackburn. It stated that firms, willing and anxious to put themselves at the disposition of the Government, had their machines now standing idle because of the impossibility of obtaining the necessary information as to Government requirements, and that local sub-contractors to the Government firms had in many cases not sufficient material to keep the available machinery running.

The Town Clerk next appealed to the Armaments Output Committee, but during May the larger centres were receiving first attention from headquarters and the local authorities continued their preliminary investigations alone. By 3 June a suggested scheme for the manufacture of munitions in Blackburn had been drawn up and was handed to Sir Percy Girouard at the meeting above alluded to. Under this scheme a committee composed entirely of members of the corporation was to be elected, who should be authorised to place contracts with local firms on behalf of the Ministry, distribute the material and receive and despatch finished shell.

The nomination of Blackburn as the centre for a district comprising 17 towns,[2] some of considerable importance, led to a complete change

---

[1] Hist. Rec./R./1121/29; Hist. Rec./H./1121·22/4; D.A.O./2/455, 562, 693, 974, 1641.

[2] They were Accrington, Bacup, Blackburn, Blackpool, Burnley, Chorley, Colne, Darwen, Kendal, Nelson, Lancaster, Lea, Morecambe, Preston, Ulverston, Wigan, Windermere.

of scheme. From being purely municipal, it was now extended to cover the wider area, and the committee elected on 10 June, and known as the North and North-East Lancashire Munitions Committee, was not confined to members of the corporation, but comprised leading business men, mainly engineers, and drawn as well from outlying districts as from the borough of Blackburn. It included six representatives of labour among its 34 members.

It was decided at an interview with Sir Percy Girouard on 15 June, that, owing to the number of small firms and the size of the districts, a Co-operative Group was better suited to their resources than a National Shell Factory and on 22 June, 1915, a Board of Management,[1] nominated by the committee, received ministerial approval to carry out a scheme for co-operative work.

The next point to be settled was the type of munitions which the newly-appointed Board should undertake. They were at first unwilling to undertake 4·5 in. and 6 in. shell, which were most urgently required, as the available machinery was considered too light, and firms were reluctant to take the risk of buying new and costly machines. The Ministry pressed for the heavier type of shell, however, with the result that a certain number of firms undertook their manufacture. In July the Board received formal authority from the Ministry to place contracts with firms in their districts for 6 in., 4·5 in. and 18-pdr. shell, and for fuses, gaines and primers. No precise number was named and within the next month orders had been placed for 117,000 18-pdr. H.E., 27,000 4·5-in., and 8,000 6-in. shells.

The distribution of contracts under this scheme remained the chief work of the Board. At the close of 1915 a National Shell Factory was set up in the district at Bacup, but a separate Board of Management was appointed for the purpose.[2] Proposals for a similar scheme at Wigan fell through, owing to the capital expenditure involved.

Some idea of the scope of the work ultimately undertaken by the Blackburn Board may be gathered from a detailed examination of its position in December, 1917, when the work was at the zenith. It was then concerned with some 80 contracts representing a weekly output of 5,575 6-in., 6,500 4·5-in. H.E., 24,600 18-pdr. H.E., 8,000 18-pdr. smoke shell, and considerably over one-quarter of a million of fuses, gaines and other small munitions.[3] Among the contractors were the Blackburn Corporation Electricity Works manufacturing 6 in., the Blackpool Corporation Tramways and the Blackpool, St. Anne's and Lytham Tramways Company, both manufacturing 18-pdrs. The following towns all had firms working under the Board : Accrington, Blackburn, Blackpool, Burnley, Colne, Darwen, Great Harwood, Haslingden, Preston and Wigan.

---

[1] See Appendix IV.
[2] See below p. 76.
[3] See also Appendix V.

II. Bury Board of Management.[1]

Bury, a member of the very important congeries of manufacturing towns in Lancashire, was among the earliest to set up a Munitions Committee. It was formed in May, 1915, on the initiative of the local Chamber of Commerce and included representatives of the Amalgamated Society of Engineers and the Engineering and Allied Trades Federation. This Committee prepared a census of the productive capacity which enabled Bury to make, on the occasion of Mr. Lloyd George's visit to Manchester on 3 June, a provisional offer to manufacture 18-pdrs.

It was then decided that the Manchester Board should control an area which included Bury. The transfer of responsibility on the whole hindered the work of the Bury Committee, who were now considering a scheme for a National Shell Factory as well as for co-operative work. They deprecated having no representation on the Manchester Board, and Manchester itself soon began to find the district it had undertaken to control too unwieldy. It was, therefore, decided in consultation with Mr. Stevenson that, as soon as there was a fair prospect of establishing a National Shell Factory, Bury should set up its own Board. Ministerial approval was accordingly asked for and obtained on 28 August, 1915, and Bury henceforward acted independently of Manchester.

The Bury Munitions Committee, and later its Board, had a difficult task before them in 1915; the big engineering and textile firms were already fully engaged on Government work and it was upon the small manufacturing firms that they had to depend. This gives a special interest to the co-operative scheme which they carried out. It was not until the end of July that the provisional scheme of 3 June was definitely formulated to, and accepted by, the Ministry. It was essentially co-operative in character, the first order for 50,000 18-pdr. shell was spread among 14 contractors, whose output varied between 410 and 25 shells a week. These contractors undertook machining only; the banding, varnishing, finishing and inspection were carried out at a central depot under the Board's supervision. They formed what is known as an assisted group and the Board, under its agreement with the Ministry, was to receive £10,000 loan free of interest; all advances had been returned and no further assistance was given after 1916. The original contract was succeeded by others along the same lines, and by means of this co-operative effort a weekly production of 5,000 shells was eventually obtained, the smallest output rising from 25 to 100 shells a week.[2] In April, 1917, the Board's finishing depot was destroyed by fire, but within six weeks it was re-established and operations resumed.

The second achievement of the Bury Board, the establishment and working of a national factory, was beset with some difficulty at the outset, as considerable trouble was experienced in finding a suitable building and at one time it seemed as if the scheme must fall through.

[1] HIST. REC./H./1121·22/6, 8; D.A.O./Misc./1394; Minutes of Meetings of the Bury Board.

[2] For the total output see Appendix V.

The problem was solved, however, by the patriotic offer of the Bury Corporation to lend a portion of their Central Tramways Depot rent free. The premises proved to be adaptable and on 20 September an agreement was signed with the Ministry by which the Board undertook to work up to an output of 1,000 4·5-in. shells.

The management of this factory was noticeably good. In the first instance, the purchase of special plant was as far as possible avoided by the adaptation of borrowed lathes. These lathes were arranged for single operation work as more suitable for women, who were recruited in sufficient quantities from neighbouring mills, so that no difficulty was found in maintaining the required percentage of dilution of labour.

The striking results attained in reducing the costs of manufacture were in April, 1918, the subject of special congratulation from the Director of Area Organisation to the Board. The figures speak for themselves. The costs, which during the experimental stage in 1916 rose as high as 63s. 11d. a shell, declined steadily during 1917 to between 27s. and 30s., and in August, 1918, worked out at 20s. 10·04d., the lowest cost attained by any National Shell Factory for 4·5 in. shell.[1]

The personnel of the Bury Board (whose original members continued in office throughout)[2] was essentially representative both of the contractors under the co-operative scheme and of the management of the National Shell Factory. It also included a member of the Manchester Board, which enabled Bury to keep in touch with the policy of the larger centre.

III. The East and West Cumberland Boards of Management.[3]

(*a*) Difficulties of Organisation.

In June, 1915, there did not appear to be much surplus capacity for the production of shell in Cumberland. The industrial interests of the eastern half of the county were, outside Carlisle, mainly agricultural; the western half was to a large extent employed on such heavy munition work as rolling steel and forgings and was not likely to be available for shell manufacture.

In spite of these drawbacks, Carlisle took early action. In May, Mr. Denman, M.P., for the borough, had approached representatives of engineering firms in the city with the result that on 9 June a meeting

[1] D.A.O./Misc./1394. The Board attributed these facts partly to the adoption of a system of payment by result. The introduction of piece-work rates early in 1917 was at first opposed by the women workers, who went out on strike between 28 February and 5 March as a protest. Results quickly proved the change to be to their advantage and the piece-work basis was henceforward maintained, skilled men receiving a bonus calculated on the amounts earned by the women over the day-work rates, and general labour receiving an overhead bonus based on the weekly output of good shell.

[2] See Appendix IV.

[3] Hist. Rec./H./1121·22/2, 3; D.A.O./Misc./1394; Hist. Rec./R/1121/29.

was held at his house which appointed a Munitions Committee consisting of seven representatives of local firms and seven representatives of local trade unions. This committee was approved by the Ministry. Members visited Woolwich on 17 June and afterwards stated their opinion that the district could manufacture a large quantity of 4·5 in., 60-pdr. and 6 in. shell, besides smaller munitions.

At this point the work of the committee was interrupted. Lord Elphinstone, who saw a deputation of the Carlisle Committee on 17 June, had then suggested that the Ministry would prefer that the whole county should be organised as one area under one committee. The suggestion was taken up readily by the Carlisle Committee, who approached Sir John Randles, manager of the Workington Iron and Steel Company, the Mayor of Whitehaven and other important representatives of the steel trade. A list was also obtained of the engineering firms and trade unions in West Cumberland, who were invited to a meeting held at Carlisle on 26 June for the purpose of electing a committee to act for the whole county.

At this meeting the existing committee was reinforced by representatives of the iron ore, steel, quarrying, smelting and coal-mining industries of West Cumberland. A small Board of Management was elected, but both it and the county committee were short-lived. Already at the meeting there had been evidence of opposition: the representative of the Cumberland iron ore miners had protested that the committee was not in the least representative of the county, giving a list of 16 important industries which had been ignored, and the Mayor of Whitehaven had moved that the election of a Board of Management should be postponed. As a result of the proceedings of 26 June, letters of protest poured into the Ministry, heaping up objections against the new committee. It was not, they said, representative of the county, but mainly of Carlisle, important industries were ignored, the large trade unions knew practically nothing of it, the natural centre for any county scheme should be Workington or Whitehaven rather than Carlisle, which was out of touch with the main industries.

A suggestion was made by the Department of Area Organisation that the Mayors of Workington and Whitehaven should call a meeting of West Cumberland to elect a committee which should then join up with the original Carlisle Committee. This was negatived by Sir John Randles on the grounds that they would not "cover the county by a long way"; he maintained that the only course was to get the Lord Lieutenant of the county to summon a meeting to elect a county committee. The Carlisle Committee then passed a resolution that they would not co-operate with any county committee "not substantially the same" as that which had already been elected, a committee whose existence most of its members, outside the Carlisle representatives, now refused to recognise. The Lord Lieutenant, however, was unable owing to ill-health to hold a meeting, and on 26 July the Ministry decided to cut the knot by

consenting to the division of the county into two munition districts, East and West.[1]

(*b*) East Cumberland Board of Management.

The original Carlisle Committee was accordingly reconstituted to control a district embracing the Parliamentary divisions of North and Middle Cumberland (which were almost entirely agricultural) and the County Borough of Carlisle. They proceeded to nominate a Board of Management with Mr. Denman as chairman, which received Ministerial approval on 14 August, 1915.[2]

The Carlisle Committee had always wished to concentrate their efforts on a national factory, and enquiries now made into the resources of the district were embodied in a report to the Ministry suggesting the establishment " at a comparatively small expense " of a factory for 4·5 in. shell. Steel could be converted into forgings locally and 19 out of the 26 necessary lathes were available. The Area Engineer confirmed this report, but negotiations for the engineering works which it had been hoped to secure for the factory failed and the Ministry finally decided that the East Cumberland Board should undertake the manufacture of 18-pdr. shell. The question of site was settled by the War Office handing over to the Ministry, on 18 September, the Rifle Drill Hall for the purpose of conversion into a national factory ; the Territorial Association also offered their Artillery Hall, which was used as a store room until, in 1918, it became necessary to restore it to its original purpose.

Preparations now went forward with speed ; shafting was erected in the main Drill Hall, while plant was hired, purchased and sometimes commandeered. On 9 October a formal agreement was signed with the Ministry, and within six months output had reached the maximum of 2,000 a week mentioned in the agreement. Local enthusiasm helped to supply the necessary labour ; in December, when the first machines started for actual production, the very limited amount of skilled labour was reinforced by veterans, some of whom had not been in a machine shop for twenty or thirty years; men over the military age volunteered as labourers; clergymen, enlisted originally to do preliminary inspection for Woolwich, remained as labourers, one vicar keeping his shift as shell stamper from the beginning to the end of the factory's existence.

The initial difficulties thus overcome, the later work of the Board was attended with considerable success and the factory output rose steadily to 4,000 a week in 1917.[3] Early in that year part of the work

---

[1] In September, 1915, a further attempt was made to get the whole county to work under one Board of Management. Both Boards were interviewed by the Director of Area Organisation, who expressed his opinion that the most could be made of the county's resources by a union of the two Boards. West Cumberland was now prepared to favour the proposal but East Cumberland, mindful of their prolonged efforts to unite the county during July, refused to entertain the suggestion. (See below, p. 66).

[2] See Appendix IV.

[3] The over-all cost of the shell throughout was 11s. 4·34d., the actual cost in the last period was 8s. 4·74d. Rejections did not amount to more than 3 per 1000.

of the factory was temporarily diverted to stripping, cleaning and re-making large quantities of proof shell (fired on the Silloth ranges) recovered from the sea. Although its main work was the administration of the National Shell Factory, small contracts for 18-pdr. shell, 9·2 in. proof shots and exploder containers were also successfully placed between 1916 and 1918 by the Board.[1]

Throughout its existence the Board co-operated with the Munitions Committee, which did not here as elsewhere sink into abeyance, the help given by the labour members in framing conditions of employment and like matters proving of the greatest value.

(*c*) Work of the West Cumberland Board.

As a result of the decision to divide the county into two munition areas, the Ministry asked the Mayors of Whitehaven and Workington to call a meeting to elect a committee for West Cumberland. Accordingly, on 2 August, a committee of twenty-seven persons was appointed which could not fail to be representative, consisting as it did of nine engineering employers, nine labour members and nine representatives of municipal and urban authorities. Sir John Randles was appointed Chairman both of it and of the Board of Management which it nominated and which received ministerial approval on 31 August, 1915.[2]

The original intention of the West Cumberland group was to set up a national factory, preferably in or near Workington, thus avoiding unnecessary transport. Serious initial difficulties, notably that of obtaining machinery, caused them to transfer their efforts towards devising a co-operative scheme for the manufacture of 4·5 in. shell, as more suitable to the district. This scheme was not considered satisfactory by the Ministry which once more made an effort to persuade the two Boards to combine their resources. The West Cumberland Board was now inclined to favour union, but the East Cumberland Board refused and the proposal was finally dropped.

Efforts to start a factory were once more resumed, and further investigation of available resources, both by the Board and the Area Engineer, resulted in renewed proposals to the Ministry, this time for a 4·5 in. factory involving capital expenditure estimated at £14,000. A more modest scheme for the manufacture of 18-pdr. shell was eventually adopted.

The agreement between the Ministry and the Board was signed on 25 November, and by it the Board undertook to produce 18-pdrs. at the rate of 2,500 per week rising to 3,000. Comparatively late as it was in starting, the Board experienced more than the usual delay in obtaining machinery, and it was not till the end of June, 1916, that the factory was fully equipped. Deliveries began in August, and from that time onward the output steadily increased to a maximum of 4,000 in April, 1917.[3]

---

[1] For the Board's output see Appendix V.
[2] See Appendix IV.
[3] For the total output see Appendix V.

Under their agreement, the Board were authorised to place contracts in the districts, but with the exception of a small contract to supply 500 rough-bored and turned shell weekly to the factory, this side of their work did not develop.

IV. Liverpool Board of Management.[1]

During the early part of 1915, efforts were made by individual firms in Liverpool to take up additional Government work, including munitions. In March, an exhibition of shells, part of a scheme initiated by the Master General of Ordnance in conjunction with the Board of Trade, was held in the Civil Service League offices and was attended by over 80 firms from the neighbourhood.[2]

General conditions were not as favourable at Liverpool as at other large industrial centres. The main industries were concerned with ship repairing, fitting up of hospital ships, armoured cruisers, etc., all now of the utmost importance to the nation. In addition there was the ordinary transport work of a great port, which had already increased 50 per cent. since the outbreak of war. Several thousands of skilled men had joined the colours and there was already serious congestion of traffic, and it seemed as if any effort to push forward a new industry on a large scale might only add to the existing difficulties.

A few firms did, however, take up shell contracts before June, 1915, but met with many obstacles. Even given suitable machinery and sufficient labour there was the difficulty of obtaining an ample supply of raw material and of getting proper supervision and facilities for inspection. The need was felt for some recognised organisation with assurance of Government support, and towards the end of May, at a meeting of the Shipowners' General Labour Committee and employers of the Port of Liverpool, together with representatives of the leading engineering firms, a Munitions Committee was elected.

On 3 and 4 June, 1915, Mr. Lloyd George with Sir Percy Girouard and Sir Frederick Donaldson visited Manchester and Liverpool. From the various meetings and conferences which were then held, certain points clearly emerged. In the first place, local feeling was strongly opposed to the ministerial suggestion that the whole of Lancashire should be organised as a single unit for munitions purposes.[3] It was finally decided, therefore, to organise at three different centres, of which Liverpool was to be one. It also appeared that the most formidable obstacle to any scheme for the production of munitions in Liverpool was felt—by employers and labour alike—to be that of the labour supply. It was generally urged that no large shell factory, which might draw away labour from the docks in the slack intervals (which were a feature of ship repairing) should be established, but that orders should be

[1] HIST. REC./H./1121·22/1; HIST. REC./R./1121/29; D.A.O./Misc./1394.

[2] Mr. Given, a member of the Liverpool Board of Management, states that a local exhibition was also held in the autumn of 1914.

[3] Lord Derby pointed out that in view of the long distances between the various centres, and also the independent temper of Lancashire people, the formation of smaller local divisions managing things in their own way would tend to greater efficiency.

placed with four or five large firms already equipped with machinery and skilled labour. A central factory for assembling and inspection might then be established.

At a public meeting at Liverpool on 4 June, Mr. Lloyd George agreed that all alike must unite to do their best for the armies in the field, making a special appeal to labour that any trade union rules which would prevent the utmost being done for the army, should, for the period of the war, be suspended.

As the result of these meetings an organisation was agreed upon which followed the main lines suggested by Sir Percy Girouard. A General Advisory Committee was elected, consisting of fourteen representatives of employers, fourteen of labour, one army representative, one Admiralty representative, a chemical expert and certain nominees of the Lord Mayor.[1] This committee was to manage a co-operative scheme through an Executive Committee and a Board of Trustees, both bodies being nominated from among its members. A special committee of the Corporation was appointed for the proposed factories at Lambeth Road and North Haymarket. The trustees took practically the position of a Board of Management, assuming the whole control of the co-operative scheme and considered themselves as directly and solely responsible to the Government. This constitution received official approval on 9 June, 1915.

The administrative machinery thus set up was too complicated to run smoothly and finally had, for efficiency's sake, to be reconstructed. The overlapping of the functions of the various executive bodies was bound to cause friction locally; the relations with the Ministry, too, were loosely defined and it was evident that closer liaison with headquarters was necessary. Two conferences with the Ministry were held on 20 July. After some discussion it was agreed that Liverpool should now be made uniform with other local organisations, the Executive Committee was declared to be superfluous, and was merged into the General Advisory Committee; the Board of Trustees, as such, disappeared but its members formed the nucleus of a Board of Management to which three additional members were added.[2] The powers of the Board of Management and its relations with the Ministry were now clearly defined, unsanctioned expenditure was checked and the Board was given authority to place contracts up to a total of £5,000 which was not to be exceeded without application to the Ministry. The area controlled by the Board was also defined.[3]

The work accomplished by the Liverpool Board of Management far exceeded the original expectation and included not only the institution of six National Shell Factories but also the general administration of an ample Co-operative Scheme. In addition the Board successfully

[1] This committee superseded the earlier Munitions Committee, whose members were incorporated in it.

[2] See Appendix IV.

[3] The area included Birkenhead, Bootle, Chester, Ellesmere Port, Fleetwood, Liverpool, Middlewich, Northwich, Ormskirk, Prescot, St. Helens, Seaforth, Southport, Wallasey, Widnes, Winsford, and the Isle of Man.

established in September, 1915, a National Filling Factory which they handed over to a separate committee working in consultation with them, and of which the history has been traced elsewhere[1]. Contrary to their fears, the labour question did not prove an insuperable difficulty in running the factories, mainly owing to the unforseen development of female labour, which was especially successful in this district; indeed all lathes at the Cunard Shell factory were operated by women and it was the first factory to produce 8-in. and 6-in. shell by female labour. Semi-skilled male labour was indeed scarce, but skilled labour proved adequate, being on occasion diverted from the workshops to which the factories were attached.[2]

The Liverpool Corporation took an active part in the establishment of the National Shell Factories. In May, 1915, they offered part of the Lambeth Road Works of their Tramways Department for a central assembly factory. The premises were accepted and adapted to the purpose of a factory which not only finished and rectified nearly two million shells of various types, but also itself maintained an output of 2,000 18-pdr. shell weekly. The Haymarket Factory was another Corporation scheme authorised in July, 1915, which was originally destined for the manufacture of 18-pdr. but was turned over to machining 4·5-in. and 6-in. shell. In both these cases, considerable numbers of machines were lent by the Corporation Department and other public bodies. The other factories set up by the Liverpool Board of Management in 1915,[3] were the Cunard Shell Factory, producing 8-in., 6-in. and 4·5-in. shell and managed for them by the Cunard Company, the Edge Lane Factory for forgings for the Co-operative Group and cartridge cases, a gauge factory at Bootle and a small factory for 18-pdr. shell at Chester. The total cost of the Liverpool factories was £5,771,360 9*s.* 6*d.*, which, taking as a basis of comparison, the cost price of their shell and the standard prices issued to Boards of Management, represents a saving of £826,628 14*s.* 5*d.*

The co-operative side of the Board's work was mainly concentrated on 18-pdr. shell. The machining of the shell only was undertaken by contractors, all finishing being done at the Lambeth Road National Shell Factory, the output varying between 12,000 and 21,000 weekly.[4] In addition to this co-operative work, ordinary contracts were placed by the Board for many millions of fuses, gaines, exploder containers and components.

Any account of local organisation of output would be incomplete without some mention of the Hoylake and West Kirby Munitions Factory, which was started in 1915 under the auspices of the Board by local gentlemen who undertook to run it in the national interest on a non-profit earning basis. The factory was housed in an existing motor garage and produced in the course of its career 63,841 4·5-in., 50,784 18-pdr. and 6,575 60-pdr. shell. A private limited company

[1] See Vol. VIII, Part II, Chap. IV.
[2] D.A.O./Misc./1394.
[3] See also Wrexham factory, p. 75.
[4] For figures of output see Appendix V.

was formed with a nominal capital and stood in the relation of contractor to the Board. So successful were its operations that not only were all capital charges paid off but nearly £20,000 in profits was handed over to the Board of Management. A somewhat similar experiment was made by the Wallasey Corporation Ferries Munitions of War Committee, but in this case no profit accrued.

V. Manchester Board of Management.[1]

(*a*) Preliminary History.

The organisation of Lancashire for munitions manufacture was hampered by considerable difficulties. Its size alone made it impossible to treat it as a whole, and there were further reasons, the result of private commercial interests in the various large centres, which placed the county as the unit of organisation outside the range of practical politics. Moreover, local rivalries were in the case of the textile trades supplemented by a general fear of what the West Riding was doing, or was not doing, in the matter of munitions, and a certain section of the manufacturers were even of opinion that Lancashire should work in conjunction with Yorkshire, so that a general settlement might then be made for the textile trades. The prevalent feeling however, was one of patriotic enthusiasm.

From the first Manchester took the lead in the organisation of the very important group of manufacturing towns in its immediate district. As an engineering and manufacturing centre of great importance it was one of the towns chosen in March, 1915, for a public exhibition of shells and fuses arranged by the Master General of the Ordnance and the Board of Trade. Local interest thus aroused, displayed itself in various ways. Numerous offers of individual help—whether of suitable works, of machinery or proposals for the actual manufacture of shell—poured into the War Office during April to be dealt with by the Armaments Output Committee. A deputation from the principal textile machinery firms in the district was also interviewed at the War Office on 16 April and by the Inspector of Shell, Sheffield, on 19 April, and as a result expressed their willingness to take up the manufacture of 4·5-in. H.E. shell. Meanwhile as a result of more organised effort the Manchester and District Armaments Output Committee was nominated on 26 April by the Executive Committee of the Manchester and District Engineering Employers' Federation to work in conjunction with the War Office Committee. To this committee, in order that it might be fully representative, the Manchester Chamber of Commerce later appointed three members of non-federated firms.

On 29 April representatives of this committee were seen at the War Office by Mr. Booth, who outlined the scheme at this time under adoption, by which experts at the Arsenal and the armament firms would teach processes to local workmen, and also discussed at some length the difficulties (which have been indicated above) of grouping the district

[1] Hist. Rec./H./1121.22/6; D.A.O./Misc./1394.

satisfactorily. On the return of the deputation the Manchester Committee circularised all engineering firms in the district, stating what steps had been taken already and announcing their intention of calling a general meeting as soon as details and specifications arrived from the War Office. They next proceeded to elect an executive sub-committee, which henceforward acted as a Board of Management, though a series of circumstances delayed ministerial approval for some months.[1]

The meeting referred to in the circular was fixed for 2 June, but the date was later changed to 3 June, as Mr. Lloyd George signified his wish to be present and to make his first public appearance as Minister of Munitions at Manchester, his birth-place. It was attended by between six and seven hundred representatives of the Lancashire engineering trades to whom Mr. Lloyd George addressed a speech of a general character.[2] Sir Percy Girouard explained the two methods of organisation, a National Shell Factory or co-operation, which were open to them, while Lord Derby spoke very strongly in favour of the organisation of Lancashire under two or three groups and not as a whole. The whole meeting eventually went into committee on this last question and after two hours discussion it was definitely decided that Lancashire should be divided into three separate areas, with Manchester, Blackburn and Liverpool as their respective centres. The following towns were tentatively suggested as coming under the Manchester area and eventually did so—Altrincham, Ashton, Bolton, Bury, Earlestown, Hyde, Oldham, Rochdale, Salford, Stalybridge, Stockport, Warrington.

(*b*) The Organisation of the Manchester Group.

On the occasion of the Manchester visit the committee submitted to Sir Percy Girouard a scheme for the production of shell under which (*a*) a limited number (not more than four or five) of the largest firms in Manchester should each receive a direct contract from the Government and should employ the smaller firms to assist them as sub-contractors, (*b*) that out-of-pocket expenses of the Manchester Committee should be defrayed by the Government and that it should be invested with powers under the Defence of the Realm Act. Sir Percy Girouard strongly demurred to the principle of this scheme, which delegated to the local committee the simple duty of co-ordinating arrangements between the firms and the Ministry. He maintained that full responsibility, especially on the technical side, should be accepted by the Manchester Committee. This point of view was confirmed by the Ministry in an interview with the Manchester Board on 9 June, but the latter body refused to take up work on other terms and for the next few months contracts negotiated by the Board in the Manchester district were placed direct by the Ministry who also defrayed all the administrative expenses of the committee. This procedure, which was unique, led not only to delay and confusion but weakened the general position of the Board with regard to the contracting firms, and in October, 1915, the Ministry set up negotiations for bringing Manchester into line with other Boards. The

[1] For the personnel of the Board see Appendix IV.
[2] See above, p. 5.

main point at issue, that of financial responsibility, hitherto declined by the Board, was solved by the introduction of an indemnifying clause in the agreement which was finally drawn up and signed between the Ministry and the Board on 8 December, 1915. All contracts were henceforward placed and paid for by the Board acting on behalf of the Ministry, and administrative expenses were, as in the case of other Boards, defrayed by the contractors from whose contracts ¼ per cent. was deducted.[1] The Board of Management was also formally authorised at this date.

By the close of 1915 considerable changes had taken place in the area controlled by the Manchester Board. The question of re-grouping the district, which was already proving somewhat unwieldy, was discussed with the Department in the latter part of June, and it was decided that it might be advisable to divide the district in such a manner that the Bolton, Bury and Rochdale districts should combine to form a separate committee with a Board of Management on similar lines to Manchester. Before this new arrangement could be carried into practical effect the matter was discussed at a general meeting of the Manchester District Armament Output Committee, attended by the Director of Area Organisation, on 13 July, when there did not appear to be any strong desire on the part of these towns to dissever themselves from the Manchester group. They accordingly remained under the control of the Manchester Board until such time as they were ready to take up independent schemes, which happened in August for Bury and in October for Rochdale.

Such changes as subsequently took place were not of a constitutional nature but were the normal results of the enormous development of the Board's work.

(*c*) Summary of the Board's Work.

In June, 1915, the Manchester Board began operations on a very modest scale, based on the minimum weekly quantity of shells and fuses which the Ministry asked from the Manchester district, namely, 20,000 18-pdr. H.E., 5,000 4·5 H.E. and 2,000 6-in. H.E., complete with fuses. Fresh sources of supply were constantly sought for and further offers for greatly increased quantities of shell were forwarded to the Ministry. On the whole there was great enthusiasm among the firms, several who could not themselves undertake shell placing their lathes at the disposal of the Board, but at the same time the Board had to report to the Ministry during the latter part of 1915 that certain of the textile machine-making firms were not doing their fair share of munitions work. The Manchester Board experienced the common difficulties in connection with the preliminary manufacture of shell, and in addition there was considerable delay (partly owing to the inevitable confusion arising from the hasty organisation of a new Ministry and partly due to the peculiar organisation of the Board already referred to) in getting early tenders accepted, occasionally

[1] See above, p. 33.

resulting in the diversion of work to other channels. Generally speaking, progress was made towards the removal of these early troubles, which arose mainly from delay in delivery of plant, the difficulty of adapting old machinery, the lack of gauges, etc., but inspection remained an ever-present difficulty until the beginning of 1917, when a change of local organisation by the Inspection Department effected a permanent improvement. As a result of these obstacles the first deliveries of 18-pdr. shell which should have been made in August, 1915, did not begin till a month later.

In October, 1915, the Corporation Tramways Depot Committee offered a part of their workshops rent free for a National Shell Factory. The Manchester Board recommended the adoption of the scheme, which received Ministerial approval at the beginning of 1916. This factory, which attained in 1917 an output of 2,000 4·5-in. shells weekly, was administered by a Board of Management independent of the Manchester Board but including one of its members.[1]

During 1916 the work of the Board expanded rapidly. In the early months the backward condition of deliveries of shell occupied their attention, and meetings were held with contractors, the causes of delay were discussed and solutions suggested, so that deliveries were eventually raised to the rates specified in the contracts, although it was not found possible to make up the arrears in the earlier deliveries. The question of reduction of prices and the renewal of contracts was also gone into by the Ministry of Munitions early in 1916, and the Board negotiated favourable terms for its contractors.

The reduction of the manufacture of 18-pdr. H.E. shell in the summer of 1916, just as their deliveries had been worked up, caused great dissatisfaction among the Board's contractors, and in some cases undoubted hardship. Contracts for 18-pdr. shrapnel were arranged by the Board with a number of firms to replace the manufacture of 18-pdr. H.E., but when preparations were completed it was found that shrapnel forgings could not be supplied by the Ministry until the end of October. Before then the position with regard to 18-pdr. H.E. shell had eased, and the Manchester Board was asked to negotiate and place contracts for 70,000 18-pdr. H.E. shell and 20,000 4·5-in. shell a week, and also to cancel the shrapnel contracts. The increased contracts for H.E. shell served to allay the discontent aroused over the shrapnel contracts, although the supplies of forgings and bar steel did not immediately increase and were always irregular.

Early in 1917 arrangements had been practically completed for the production in the Manchester area of the required number of 18-pdr. H.E. shell. It was found necessary to employ a number of small contractors who could not economically carry out certain of the finishing operations on the shell, which were undertaken for them by more experienced firms. The costs of these various operations were very carefully gone into by the Board and the firms concerned and prices adjusted for each of these operations or combinations of them.

[1] See Appendix IV.

Another experiment in co-operative manufacture was made in the case of fuse No. 106. In September, 1916, the Manchester Board was asked to obtain from its contractors a supply of 15,000 per week. As the two principal fuse makers in the area were at this time fully occupied, only comparatively small and inexperienced firms were available. Arrangements were therefore made by the Board to place contracts with the lesser firms for the fuse components which were ultimately assembled by firms who also possessed the necessary facilities for machining and finishing the fuse bodies. The manufacture of this and other fuses and of various types of components was carried out on a very large scale under the auspices of the Board.

The reduction in the output of gun ammunition in November, 1917, made it necessary to secure other work for the contractors under the Manchester Board, which in common with other Boards was offered contracts for the production of aeronautical general supplies. Negotiations lasting over several months were also carried on between the Board and the Controller of the Merchant Shipping Department with a view to turning over their contractors to the production of standard ships, but in spite of frequent meetings with contractors, interviews with the Admiralty and inspection of yards building standard ships on a considerable scale, no result was achieved. The production of aeronautical general supplies, however, which proved suitable for the smaller and lighter type of machinery, was started on a considerable scale and production was in full swing when the signing of the Armistice stopped the work.

At the beginning of 1918 the notice given by the Ministry to the Board to terminate all contracts for 6-in. shell and over reacted correspondingly on the output of fuses and components, and the position was for a time very difficult.[1] The Board continued its efforts to find other work for the Manchester contractors, with the result that contracts for special stores were placed by the Aeronautical Supplies Department, by the Mechanical Warfare Department (for complete tanks, tank hulls and epicyclic gear boxes), and by the War Office (for machine gun emplacements, exploders, sighting gear, etc.). All this work was well in hand by the early autumn of 1918, but the bulk of it had to be cancelled after the Armistice.

In conclusion, it should be noted that throughout its career the Manchester Board not only acted in close co-operation with the Ministry's Area Engineer, and so was brought into touch with all sides of munition work in the district, but was also intimately identified with general local organisation, for Mr. Bissett, Secretary of the Manchester Board, also acted as Secretary to the Boards of Management Representation Committee and to the Boards of Management Executive Committee.

---

[1] The shell contracts placed in the district at this time included weekly deliveries of 400 9·2-in., 250 8-in., 7,150 6-in., 8,950 4·5-in., and about 80,000 18-pdr. H.E., besides proof shot, etc. (HIST REC./R./1121/29.) For details of the Board's total output see Appendix V.

VI. The North Wales Board of Management.[1]

It proved no easy matter to organise a scheme under one Board of Management which should include within its scope the scattered resources of North Wales, and should adjust the conflicting claims of the few towns of any size which were equally anxious to be immediately concerned.

There was a ready response to the Ministry's appeal. Wrexham was the first to define a plan. A Munitions Committee, which included the Corporation, was formed in June, 1915, and it was decided to set up a National Shell Factory within the Borough. The scheme must be regarded as essentially a piece of municipal work ; it was developed at meetings of the Town Council, and the executive committee, which was elected by and superseded the Munitions Committee, consisted simply of the Corporation with a few co-opted members. Corporation buildings were taken over, rent free, for the purposes of the factory, and business connected with it was carried on by the Borough electrical engineer.

Early in July the Committee began to make arrangements with the Liverpool Trustees for affiliating their isolated scheme, and on 13 July the Trustees advanced £1,100 for the factory. By this time, however, other parts of North Wales were clamouring for organisation and the formation of a North Wales Area was under consideration. The Wrexham and Liverpool contract was therefore subject to the condition that should a district be formed and Wrexham wish to join, the management of the factory should be transferred and the money refunded.

Throughout July an investigation into the engineering resources of North Wales was conducted on behalf of Sir Percy Girouard, while the Liverpool Trustees continued to explore the same area on behalf of Wrexham. This resulted in considerable overlapping in North Wales, and business men were getting confused and irritated by the many inquiries. There appeared to be, however, a very general and strong desire to organise the area along independent lines, and Mr. Buckley, who had been authorised by Sir Percy Girouard to investigate the matter, was now instructed to call a meeting to elect a committee for North Wales. A body of twenty persons, representing both employers and labour, drawn from the counties of Anglesea, Carnarvon, Denbigh, Flint and Merioneth, was elected on 12 August at Rhyl, and proceeded to make proposals based on Mr. Buckley's report as to the number of lathes available. These proposals were for the establishment of National Shell Factories at Carnarvon, Portmadoc and Flint, the last scheme to be dropped if Wrexham joined the North Wales Area.

The Wrexham Committee had hitherto opposed the setting-up of a North Wales Committee, mainly on the ground that there was not sufficient machinery available to justify its formation. Much of the machinery in Mr. Buckley's list had already been counted on for Wrexham, and the proposal to establish three more factories would impose further limits on Wrexham. To them, too, co-operation with

[1] D.A.O./Misc./1394 ; HIST. REC./H./1121·22/5.

Liverpool was more satisfactory than with Carnarvon or Portmadoc at a considerably greater distance. When, however, it became clear that the organisation of North Wales was an accomplished fact, they prepared to reconsider their attitude. Both committees were interviewed at the Ministry on 15 September, when a satisfactory arrangement was arrived at. The Wrexham committee was co-opted to the committee for the North Wales Area and the factory was to come under the Board of Management, which should include Wrexham representatives.

This Board,[1] which received ministerial approval on 25 September, had first to settle what kind of work should be undertaken. The Area Engineer had definitely pronounced the district most unsuitable for co-operative work, for the general enthusiasm and ready consent with which firms gave up their plant could not disguise the fact that it was poor in quality and limited in quantity. Wrexham Factory was in a fair way to establish itself, and after some discussion it was decided to establish two more factories at Carnarvon and Portmadoc. All these factories were for 18-pdr. shell, as the Director of Area Organisation did not consider North Wales in a position to undertake the larger type of shell. On 22 October, 1915, formal agreements for these three factories were signed between the Ministry and the North Wales Board of Management. In every factory the Board undertook a preliminary output of 500 shells rising to 3,000.

An important addition of new lathes was made by the Ministry to Wrexham, which enabled that factory to turn out 700 shells weekly by the end of 1915. The other factories, not so adequately equipped, did not begin to produce before 1916, and, throughout, all shells manufactured in the district were sent to Wrexham to be finished.[2]

In addition to running the three factories the Board placed contracts in various parts of the area for 18-pdr. H.E. and shrapnel, proof shot and various components. The total turn-over of their work approximated to £1,196,957.

VII. Rawtenstall and Bacup Board of Management.[3]

The boroughs of Rawtenstall and Bacup originally formed a sub-area under the Blackburn Board of Management. In September, 1915, they decided to take independent action in exploiting the resources of their Rossendale Valley, and with that intention the "Rossendale" Munitions Committee was formed.

This committee determined to establish a National Shell Factory. A canvass of lathes in the district showed that some forty might be suitable, of which number ten were offered by the tramway depot, and had already been used on a sub-contract for shell. Mr. Hargreaves, a member of the committee, offered the Irwell Mill, a disused weaving shed in a central position in Bacup, rent free for factory premises.

---

[1] See Appendix IV.
[2] For details of output see Appendix V.
[3] D.A.O./Misc./1394; D.A.O./2/437.

The committee, thus prepared, next approached the Ministry of Munitions with an offer to manufacture 750 4·5-in. shell a week, which received favourable consideration, and on 11 December, 1915, a Board of Management[1] received official authority to carry out the scheme.

The Board had to contend with certain disadvantages which in the first year were reflected in high costs of production. This was largely due to an equipment not originally designed for shell-making, which often taxed to the utmost the skill and ingenuity of the manager to make it answer the required purpose. The lack of piece-work or bonus during 1916 also partly contributed to high costs, and the later introduction of this method of payment had very good results. Other and more general causes arising from shortage of forgings, change of mark or defective copper bands, were also prevalent.

Despite these drawbacks, output at the factory steadily increased: the authorised output rose in 1917 to 1,500 shells a week, while the total number of shells produced in the month preceding the Armistice was 8,278.[2]

At the close of 1917 the Board of Management was authorised to undertake a second scheme. A weaving shed and a four-storeyed mill were secured for the production of 6-in. shell, but while equipment was still in progress it was decided, owing to the shortage of steel, to abandon the manufacture of shell and to use the factory for the rectification of forgings and shell instead. Work on 6-in. forgings began first in the spring of 1918, and deliveries of rectified 4·5-in. were made at the end of June, but the output of 18-pdr. rectified shell was considerably delayed and had hardly begun at the time of the Armistice.

VIII. Rochdale Board of Management.[3]

In June, 1915, when it was decided to divide Lancashire into three separate areas for the local organisation of munitions production, Rochdale was attached to the Manchester Committee. A small Munitions Committee had already been formed in May, 1915, which was prepared both to establish a National Shell Factory and to run a small Co-operative Group for the production of 1,000 18-pdr. shells a week, and a scheme on these lines was under discussion with the Ministry.

The Manchester Committee were disappointed in the small co-operative output promised by Rochdale from whom, as one of the centres of the textile trades, and also as possessing foundries and machine works of their own, they had expected a scheme of far greater importance. The Rochdale Committee on the other hand maintained that as 75 per cent. of the work of the town was already for the Government, and that as they had been specially instructed to concentrate on lathes, it would be imprudent to embark on a larger scheme. It was therefore

[1] See Appendix IV. [2] See also Appendix V.
[3] HIST. REC./H./1121·22/6,7.

decided in July, 1915, that the co-operative scheme should be abandoned for the time and the attention of the committee concentrated on the factory.

It seemed at one time as if this scheme, too, must fall through for lack of premises. About the only suitable building available was rejected by the Ministry on account of the high rent required, while others suggested required large capital expenditure for necessary adjustment and reconstruction. The question was finally solved by the rent-free offer, through the Mayor of Rochdale, of a portion of the new tramway shed, then in course of erection.

The Rochdale Committee was now able to resume its independence of Manchester, and to appoint its own Board of Management. All these negotiations had taken time, and it was not until 25 October that a Board was approved by the Ministry, while the agreement between it and the Ministry was not signed until 17 November, 1915.[1]

The factory, when complete, was to manufacture 6-in. shell, working up as quickly as possible to 1,000 a week. Both the Ministry and the Board recognised that the completion and equipment of the factory was likely to be a lengthy business, and the date of first delivery was fixed for March, 1916, but this generous time limit, from one cause and another, was considerably exceeded. The chief impediment to progress arose from the contractors' delay in completing the building, a delay largely owing to the abnormal conditions of the building trade.

When on 21 August, 1916, the first load of 121 shell was delivered into bond, the Ministry were already aware that certain difficulties were interfering with the efficient management of the factory. There was no preliminary inspection until the shell was practically finished, with a consequent accumulation of shell impossible to be retrieved; there was no rectifying plant; many of the feeds on machines were of an out-of-date type; and the chucking arrangements were useless and impracticable. As a temporary expedient the factory was placed for three months under the direct management of the Area Engineer, working in conjunction with a member of the Board.

The results were entirely successful, and by November the factory had reached its designed output of 1,000 shell a week. At the conclusion of the three months a standing committee, composed of the Area Engineer, an official of the Tramways Department and two members of the Board, was appointed to control the working of the factory, reporting regularly to the full Board.

The co-operative side of the Board's work never developed as hoped. Under their agreement of 17 November, 1915, they were authorised to place orders in their area, and in February, 1916, certain contracts hitherto placed by the Manchester Board were transferred to their jurisdiction. During 1917 an attempt was made to develop local resources, but by this time the larger proportion of firms had secured direct contracts with the Ministry, and the number of the Board's contractors never exceeded a dozen.[2]

---

[1] For the members see Appendix IV.
[2] For output see Appendix V.

CHAPTER IX.

THE YORKSHIRE GROUP (AREA III).

I. Leeds Board of Management.[1]

(*a*) The Early History of the Board.

The Leeds Board of Management has a double claim to distinction in that it was the earliest Board of Management to receive official approval as such, and that it provided the original model for the National Shell Factories which were later set up throughout the country. Certain aspects relating to the initiation of the scheme have been dealt with elsewhere, but it may be well to recapitulate here the early history of the Leeds movement.

At the beginning of March, 1915, Leeds, as an important engineering centre, was chosen for one of the sample exhibitions of shell arranged by the Master-General of the Ordnance. As a result of the interest thus aroused, the idea of a co-operative group was taken up independently in two quarters. In the first place, four representatives of the Engineering Employers' Federation, all representing the Leeds locality, were interviewed by the Master-General of the Ordnance on 24 March,[2] and proposed that the War Office should use the organisation of their Federation for placing orders, and guaranteed that under such a scheme every lathe and every engineer, if wanted, should be set working on the production of war material. On 13 April the Leeds and District Engineering Employers' Association appointed a special local committee to deal with the question of munitions production in their district, consisting of the four gentlemen who had already interviewed the Master-General of Ordnance (Mr. McLaren, Chairman of the Agricultural Engineers' Association, Mr. Bagshaw, Chairman of the Leeds Forge Company, Mr. Meysey Thompson and Mr. James), with the addition of Mr. Alex Campbell of the Hunslet Engine Company. This committee was later to become identical with the Leeds Board of Management.[3]

Meanwhile the question had been under the consideration of the Leeds Labour Exchanges, who approached Leeds engineering firms at the close of March, 1915, and arranged with the Lord Mayor for a

---

[1] 94/Leeds/5 ; 94/Nat./139 ; C.S.M. 30564 ; D.A.O./3/286, 358 ; Hist. Rec./H./170/2 ; Hist. Rec./R./1122·2/2, 6 ; Hist. Rec./R./1121·23/2 ; Hist. Rec./R./1121/29. Vol. I., Part III., Chap. IV. ; (Printed) *Weekly Report*, No. 37, III. (8.4.16), 150 VI., A. (13.7.18), 152, VI., A. (27.7.18), 157, VI., A. (31.8.18) ; Hist. Rec./R./346·2/47.

[2] Vol. I., Part III., p. 59.

[3] The personnel of the Board remained the same throughout the war. See Appendix IV.

public meeting to be held on 15 April. The letters of invitation issued suggested the organisation of a group somewhat on the plan arranged at Leicester.[1]

The result of the meeting was to bring these two independent lines of activity together and to confirm the committee appointed by the Federation.[2]

A visit was paid to Woolwich on 22 April, and on 29 April members of the committee, accompanied by some managers of firms, visited Elswick. The result of these visits was a change of policy leading to the idea of a National Shell Factory being substituted at Leeds for the Co-operative Group it had been intended to form. The proposal came from the Leeds Committee themselves who, impressed by the difficulties likely to arise in co-operative work from lack of machine tools, supervision, inspection and control, suggested the selection of a suitable factory and the concentration of tools, workmen, supervision and inspection under one management on a non-profit basis, and proposed while the factory was being equipped to send labour to a properly-organised ammunition factory for instruction.

On 3 May the Leeds Committee forwarded to the Armaments Output Committee a draft scheme for a national factory, and on 13 May the sanction of the Government to proceed with the undertaking was obtained. On 20 May the sanction of the Army Council was given to the establishment of a shell factory, and at the same time the gentlemen who had hitherto acted as a local committee were authorised to form a Board of Management to carry out the scheme.

Under the agreement with the Government it was stated that a general committee such as existed in other towns, representing both employers and labour, would act in an advisory capacity to the Board. This committee, known as the Leeds Munitions Committee, was appointed at a public meeting held by the Lord Mayor on 31 May. It consisted of leading citizens and manufacturers of Leeds, besides four trade-union representatives, and its interests were not confined to questions arising out of the work of the National Shell Factories. As time went on its meetings became more infrequent although it was never actually dissolved.

(*b*) The Work of the Board.

Under their agreement with the Government (which, as has already been indicated, formed the model for all future factories[3]) the Board undertook to produce at least 20,000 18-pdr. H.E. shell a week, increasing to 40,000 if required. Owing to the need for heavier shell however, they were almost immediately instructed to prepare for an output of 5,000 4·5-in. H.E. shells, and in July, 1915, also undertook to equip a

[1] See below, p. 93.

[2] The local Chamber of Commerce, who had been prepared to assist, stood aside, by Sir A. Firth's advice, in favour of the Federation.

[3] See Appendix III. (*b*).

6-in. shop in the factory. The site of the factory was a new building, part of the premises of the Leeds Forge Company, at Armley Road, to whose initiative the success of this and other National Shell Factories later set up in Leeds is largely due. Local machinery did not prove adaptable to shell manufacture, and, in spite of their willingness, local firms were only able to contribute about 40 to the original equipment of 230 lathes. A contingent of men was sent to Messrs. Armstrong's works at Newcastle to take three weeks instruction in shell and lathe work, and first deliveries of 4·5-in. shell took place in September, within a month of schedule time.

The Leeds Board of Management concentrated their work on factories. Before August, 1915, the Ministry had accepted their offer to erect a factory for the manufacture of 9·2-in. shell on a site at Newlay, belonging to the Schoen Steel Wheel Company. The factory was controlled by the Leeds Forge Company under the general supervision of the Board.

During 1916 yet another factory for 15-in. and 9·2-in. shell was established, derelict premises at Hunslet being taken over for the purpose, and the Leeds Board also took over a fuse factory from the Leeds Munition Company and transferred it to the Armley Road factory to which it was adjacent.

Early in 1917 the Hunslet factory was instructed to turn over to the re-lining and rifling of 18-pdr. guns, and shell manufacture gradually ceased. The first repaired gun was produced in August, 1917, and a few months later the manufacture of 18-pdr. guns, Mark II., began. The factory attained an ultimate monthly capacity of 150 repaired and 200 new guns, and in addition undertook the rifling of 60-pdr. guns, 6-in., 8-in. and 9·2-in. howitzers, the manufacture of 18-pdr. recuperators and 6-in. and 8-in. recuperator liners.[1]

The Leeds Board of Management in its operations was spared two difficulties generally to be found in large munitions centres, namely lack of labour and of housing accommodation. In the summer of 1915 a census of empty houses showed that there were 1919 vacant houses, of which 1516 were at a rent not exceeding 10s. per week, while lodging accommodation of labour in Leeds was believed to be ample. The conditions of labour in Leeds were old-fashioned at this time. Industry though nominally under limited liability companies, was still largely patriarchal: employers knew their men and were known by them from one generation to another. Leeds proved to be self-supporting in the matter of munition workers throughout, although at the beginning of 1917 the numbers employed at the various factories of the Board had risen to 4,447 men and 3,183 women. By far the greatest number came from Leeds itself or its immediate surroundings. The Board had done much to educate Leeds public opinion as to the value of female dilution of labour, and the women employed by them were of a very superior type, drawn from the wives of mechanics, domestic

[1] Vol. VIII, Part II, Chap. III.

servants and women employed in the textile trades. At this time all the factories were running very successful canteens, for it was recognised that the heavy nature of the work on shell made good meals a special necessity.

The question early arose as to the administration from headquarters of the Leeds factories whose output was mainly heavy shell,[1] which technically brought them into the class of National Projectile Factories. They remained attached to the National Shell Factories until August, 1916, when it was decided to transfer them to the department administering National Projectile Factories. In September, 1917, as a result of the Hunslet factory taking up ordnance work, the Leeds factories were all transferred to the Gun Manufacture Department and were henceforward known as the National Ordnance Factories, Leeds. The local organisation of the Board of Management was still retained, however, and continued its useful career down to the time of the Armistice.

II. Bradford Board of Management.[2]

On 8 April, 1915, at a meeting in Bradford, convened by the Lord Mayor and attended by 130 employers in the district, a committee was appointed to consider the possibilities of forming a local munitions group. Bradford was not an engineering centre, but a census of machinery, which was the preliminary work of this committee, showed that the textile manufacturers were full of enthusiasm and offers of lathes were freely made. Their main difficulty in formulating a scheme was the lack of raw material.

On 23 April a deputation from the Bradford Committee was interviewed at the War Office. They were now prepared to take an order for shell and distribute it among local contractors. Their proposal, foreshadowing in some sort the scheme of the National Shell Factory,[3] was to have a central depot, where raw material and half finished shell would be received and where "key" operations could be performed. They were instructed to proceed with their organisation pending more definite arrangements, and a visit to Elswick was arranged.

Meanwhile orders for munitions of various kinds were being placed in the district in ever-increasing numbers, and the committee felt that a National Shell Factory rather than the distribution of orders among a group of contractors was the best means of employing the 114 lathes which had now been placed at their disposition. On 19 May accordingly they lodged an offer with the War Office to manufacture a weekly maximum of 2,000 4·5-in. H.E. shells (an offer almost immediately raised to 4,000), or their equivalent in 18-pdrs., forgings to be supplied by the Government. The offer was provisionally accepted on 21 May, and ten days later a formal agreement was signed and a Board of Management authorised by the Army Council.[4]

---

[1] See Appendix V.
[2] D.A.O./3/246, 395, 518, 684, 762.
[3] See above, p. 80, under the account of Leeds.
[4] The personnel is given in Appendix IV.

The Board decided to manufacture 4·5-in. as being more suited to their machinery. The work was at first very uphill. The best building available, a portion of the Valley Dye works, was ill-adapted for the purpose: the second-hand lathes were not a success. First deliveries, which it had been expected to make in August, 1915, were in this way delayed until November, 1915. Efficient management gradually overcame the obstacles; during 1916 the whole of the dye works were taken over for the factory, the old machinery was replaced by stronger and more suitable plant, and an output of shell, maintaining a weekly average considerably in excess of the original agreements, was successfully kept up down to the time of the Armistice.[1]

Perhaps, however, the most valuable work done by the Bradford Board was on fuses. On 10 June, 1915, when the need for this type of munition was most urgent, they wrote "our intention is to produce an equal number of fuses to shell." Accordingly a part of the factory was equipped for the purpose, and deliveries began in January, 1916. The fuses made were Nos. 103 and 106, and the Board attained a very remarkable degree of success in their manufacture, turning them out at a cost of 2s. 11d. as against the contract price of 4s. Part of the Board's success in fuse-making was due to co-operative methods, for it was an integral part of their programme to give out the manufacture of individual parts to a certain number of selected contractors at very economical prices, the assembly of the whole being done in the national factory. Between 1916 and 1918 gaines and adapters, as well as the whole fuse, were manufactured on these co-operative lines, and in this way the Board produced over five million components.

III. Halifax Board of Management.[2]

In the early spring of 1915 the Engineering Employers' Federation approached the Halifax association regarding the utilisation of local capacity for producing munitions. Halifax engineering firms were principally engaged either on machinery for the textile trades (at this time largely given over to the spinning of khaki yarn) or on the manufacture of machine tools. After considerable discussion they decided that no shell could be made in their district and so informed the Engineering Employers' Federation on 21 April, 1915.

Within a month, however, the Halifax engineers had been drawn into what had now become a national movement and had set up a local Munitions Committee. Their scheme, which was for co-operative work as being less likely to disturb local conditions, was fostered by Sir Algernon Firth, who personally commended its acceptance to Sir Percy Girouard.

The agreement between the Ministry and the Halifax Munitions Committee was dated 12 June, 1915. A Board of Management[3] was then authorised to carry out a contract for 200,000 18-pdr. H.E.

[1] See Appendix V. for total output.
[2] D.A.O./3/507; D.A.O./Misc./308, 1394; Hist. Rec. H./1121·23/3.
[3] See Appendix IV.

shell by co-operative methods at a maximum delivery of 5,000 shells a week. Twenty-two firms formed the original group among whom this order was divided, but at the express wish of the Machine Tool Department of the Ministry, twelve of them withdrew almost immediately to concentrate on the production of machine tools. Each remaining member of the group completed the shells at their own works and delivered them to the Government's bond room for final inspection.

The work of the Halifax group was influenced by the changes in the munitions programme, bringing with them the inevitable delays arising from necessary changes in tools and plant. As the demand for 18-pdr. shell decreased, firms turned over in 1916 to the manufacture of 4·5-in. H.E. shell. During 1917 a renewed need for 18-pdr. shell, both H.E. and chemical, arose, and a certain number of the group returned to its manufacture, guaranteeing between them an output of over 12,000 shells weekly, which must be considered a notable rise on the original offer of 5,000 from the whole group.

The Board also supervised from 1915 onwards the production of 6-in. shell by two contractors, and placed orders for small quantities of components in the district.

The figures setting out the results obtained from the Board's contractors are given elsewhere.[1]

IV. Huddersfield Board of Management.[2]

Huddersfield, as one of the centres of the cloth trade and textile machinery, was little adapted for shell-making. Nevertheless when, as part of the general campaign for organising local resources in April, 1915, meetings were held in the town in order to impress the urgent need for munitions, they met with a ready response and a War Munitions Committee was formed. This committee consisted in the first place of engineering employers, but representatives both of labour and of firms connected with the cloth manufacture and chemical trades were afterwards added. The committee was fortunate in that it had as adviser Sir Algernon Firth, who was personally connected with the neighbourhood.

By the middle of May the committee had collected sufficient data to enable it to formulate a definite offer to the War Office of 5,000 shells, preferably 18-pdr., a week. On being given their choice they decided to establish a National Shell Factory rather than to form a co-operative group, and a draft scheme was broadly agreed on at a meeting, attended by members of the proposed Board of Management, at the War Office on 20 May. Certain alterations were made later in the scheme, notably in the matter of output, later investigations leading the committee to guarantee a weekly output of 2,000 shells only. The option of suitable premises was also secured. A second meeting was held at the War Office on 2 June, and on the same day a Board of Management was formally authorised to control a National Shell Factory.[3]

[1] See Appendix V. [2] D.A.O./Misc./1394; HIST. REC./H./1121/11.
[3] For the members of the Board see Appendix IV.

The Huddersfield Board, whose secretary was made general manager of the factory, suffered much initial difficulty with their scheme. To begin with, the hundred or so machine tools that had been, with the best motives, given up by local firms proved wholly unsuited to their work, and before the end of 1915 practically all the original tools had had to be replaced by new ones. Added to this there was in the early days an almost constant shortage of material. In spite of these delays the first shell billet was cut off by 2 August and deliveries began to be made in November, 1915.

The later history of the factory was very satisfactory. It passed successfully through the ordinary tribulations of an 18-pdr. shell factory, being turned over to shell-heads during the latter half of 1916 and back again to 18-pdr. shell in the spring of 1917. The maximum output attained was 7,500 shells a week, which compares very favourably with the original offer of 2,000.[1] Women were successfully employed from the first, and there appears to have been a specially strong feeling of comradeship among all the workers throughout. This tended to raise the standard of work to the high level which it attained; the management boasted that no single lot of shells was ever rejected at firing proof, and it was reported on good authority that at the factory where the Huddersfield shell went to be filled, "when a truck-load of our shell entered the Barnbow Factory there was a rush for the first claim on them."[2]

Two Munitions Committees, one representing Dewsbury and Batley and the other Brighouse, were affiliated to the Huddersfield Board of Management. There was an unsuccessful attempt to establish a separate factory at Batley, and it was also hoped that the Board might establish a group for co-operative work, but, with the exception of small orders for components placed in 1915, the attempt to develop work on these lines was abandoned.

V. Keighley Board of Management.[3]

Early in April, 1915, a local Munitions Committee, composed of representatives of twenty-two engineering firms in Keighley, was formed with the purpose of furthering the production of munitions.

The prospects were limited; there was no supply of raw materials in Keighley, nor could forgings be obtained locally, while it was decided that nothing must be done to hamper the work of machine-tool makers in the district. In spite of these limitations, however, the committee, which was mainly representative of firms manufacturing spinning machines and looms, considered that the available machinery in their works might be applied to the lighter type of shell, and on 26 April, 1915, their representatives sought an interview at the War Office prepared with an offer to manufacture 1,000 18-pdr. shrapnel a week.

---

[1] For the total output see Appendix V.

[2] Report of speech by the manager of the factory made on 7 December, 1918, filed in D.A.O./Misc./1394.

[3] D.A.O./3/742, 672, 641, 517, 654, 403, 357.

A working sub-committee was appointed to develop the available resources which, shortly after this meeting, it was decided to concentrate in a National Shell Factory. During the next month plans, embodying (to quote Sir Percy Girouard) "a sound scheme in sound hands," were developed,[1] and on 31 May, 1915, the Secretary of the Army Council sanctioned the establishment of a factory for the manufacture of 5,000 18-pdr. shell a week. At the same time the sub-committee was authorised to act as a Board of Management, of which Sir Harry Smith was appointed chairman.[2]

The work of the National Shell Factory was uniformly successful. It was among the first to start producing, and the output originally promised was more than doubled, while costs were low. By an extension of the scheme, too, from October, 1916, onwards the factory manufactured 3·7-in. shell, with a maximum output of nearly 5,000 shell.[3]

In the autumn of 1917 the work of the Board underwent a further development. In response to the demand for an increased number of 6-in. shell, they offered to manage a factory for this type of shell. The proposal was accepted on 14 November, and premises were erected at Ministry expense on a site offered rent free by the firm of Mr. Still, a member of the Board. Unfortunately in January, 1918, when the factory was almost completed, the scheme had to be abandoned owing to the steel shortage. The Board did all in their power to save the Ministry further unnecessary expense and to find some work which would justify the completion and use of the factory. A suggestion that it might be used for aircraft parts was rejected, and it was not until June, 1918, that it was finally decided to use the factory for the manufacture of 18-pdr. castings, of which deliveries were being made in considerable numbers when the Armistice put an end to its work.[4]

Under its original agreement the Board administered the district covered by the Keighley and District Engineering Employers' Federation. With the exception of isolated instances in the case of 18-pdr. shell and wooden plugs, the Board devoted its energies to the management of the factories and did not supervise any contract for the Ministry.

As indicated, the work of this Board was regarded by the Department as particularly successful. Outside circumstances it is true contributed—dilution for example presented little difficulty in a district where the employment of female labour was no novelty—but the main reason was the close touch which the Board maintained with the factory. This was the key-note of their success, which is admirably summed up in their reply to the Ministry when asked to send minutes of their meetings—"The Board are continually meeting, morning, afternoon and evening, it is one long meeting and they would not know what to put in the Books."

---

[1] Minute of Sir P. Girouard, dated 29 May, 1915, filed in D.A.O./3/517.

[2] See Appendix IV.

[3] For the year 1917-18 the cost for 18-pdr. shell worked out at 8s. 4d. each and for 3·7-in. How. 14s. 3·9d. each. For details of output see Appendix V.

[4] The deliveries in September, 1918, were 9,000 a week. (Printed) *Weekly Report*, No. 160, VI. (A) (21.9.18).

VI. Rotherham and Barnsley Boards of Management.[1]

(*a*) Early Organisation of the Rotherham and Barnsley Districts.

In the spring of 1915 a very large proportion of the engineering work done by Rotherham and Barnsley firms was either for the Government or to be regarded as work of national importance. At Rotherham, owing to its proximity to Sheffield, a considerable amount of subcontracting was done for Admiralty work; a good deal of shell steel was also turned out, while one or two firms specialised in railway wheels and axles, work which was important from the point of view of transport. Most of the Barnsley firms were engaged in turning out colliery machines, and had to be prepared for urgent repair work.

It was evident that neither machinery nor men could be diverted, and at a meeting of engineering employers arranged by the Board of Trade on 30 March, 1915, the possibility of forming a local group for the manufacture of shell was discussed. The outcome of this meeting, at which Barnsley employers agreed to join Rotherham, was the formation of a Munitions Committee. In spite of the limiting factors above indicated, it was decided that by centralising machinery and using surplus labour, Rotherham could produce 400 to 500 shell, preferably 4·5-in., a week and Barnsley another 200.

An offer based on these lines was made by a deputation to the War Office on 27 April, but was not considered large enough to place the district among the units to be dealt with first, and a final decision was deferred. During May the committee was pressed to promise a minimum weekly output of 1,000 4·5-in. shell, but they did not see their way to so large an increase, and they were, therefore, at the end of the month authorised to start with 500. They hesitated for some time between the relative merits of the Co-operative Group and the National Shell Factory systems, but finally decided on the latter and by 15 June negotiations for the establishment of a National Shell Factory had been carried through, a draft agreement submitted, formal authorisation received and a Board of Management approved.

Meanwhile, it had become doubtful whether Rotherham and Barnsley could co-operate successfully on one scheme. Barnsley, as the lesser, had always feared lest their machines and men should be taken to Rotherham, and they now decided to try and arrange for the collection of their machinery in a shop of their own, which should, however, be worked in close co-operation, and should be controlled by the same Board of Management. This plan was agreed to by the Ministry and matters rested thus until the middle of August, by which time the impossibility of any satisfactory co-operation was manifest. After further meetings at the Ministry, the final and complete separation of Rotherham and Barnsley was agreed to, and on 17 August separate Boards were constituted for the two districts.[2]

---

[1] Hist. Rec./H./1121·23/2, 4; D.A.O./3/641, 642, 646, 683, 717. (Printed) *Weekly Report*, No. 98, II. (30/6/17), 101, II. (21/7/17).

[2] For the members of the Boards see Appendix IV.

(*b*) The Work of the Independent Boards.

Both the Rotherham and Barnsley Boards of Management have concentrated the surplus capacities of their locality in National Shell Factories, and districts which in 1915 made prudent demur at promising a combined weekly output in excess of 500 shell eventually produced some 9,000 shell a week between them.

The Rotherham Board.—The Rotherham scheme had the defects of its qualities, and the factory was handicapped in its early career by the antiquated and unsuitable local machinery without which, it is true, it could never have been started. Another drawback was the premises, which occupied two sites some distance apart; different operations were carried out at each unit; but nevertheless there was an appreciable increase in the difficulties of supervision and inspection, while it took some time to correlate successfully the work of the two units.[1] The Board, two of whose members represented the firms from whom the buildings were rented, seems to have successfully overcome this latter disadvantage, for when in June, 1917, the Ministry was considering alternate schemes for improving the lay-out or combining the factory in one unit, the Board expressed so strong a wish to retain the two buildings that it was decided to take the former alternative.

The factory suffered no great dislocation of its work: during 1917 it produced weekly 1,000 4·5-in. chemical shell in addition to the 4·5-in. H.E., and shortly before the Armistice it was decided to turn the factory over entirely to the manufacture of chemical shell.[2]

The Barnsley Board.—On 30 August, 1915, the Barnsley Board of Management received the formal approval of the Ministry to manufacture 500 4·5-in. shell, increasing eventually to 1,500. The patriotic offer of Mr. Gillott, one of the members of the Board, who offered premises at a rental which merely covered taxes, was accepted. It was hoped to begin production in six weeks' time, but owing to various causes (among which must be placed the inexperience of the staff, especially in connection with thread-milling), although there was an accumulation of shell in various stages, regular output did not begin till March, 1916. Once begun it mounted steadily to a maximum of 4,000 by the beginning of 1917.[3]

In the autumn of 1917 the Board took on additional work in response to the urgent need for 6-in. shell. A scheme which they submitted for an output of 1,500 to 2,000 shell was approved, and an old weaving shed, which could be adapted and in working order within four months, was accordingly taken. Unfortunately, before manufacture could begin, this scheme, like others, had to be abandoned owing to the steel shortage. As the premises were in some ways more

---

[1] Thus in November, 1915, one section of the factory was producing 600 turned shell a week, which the other section was not ready to complete.

[2] The total output is shown in Appendix V.

[3] See also Appendix V.

suitable, the plant of the other National Shell Factory was transferred here. The dismantled factory remained idle until September, 1918, when fresh 4·5-in. plant was installed, which was not, however, in full working order when the Armistice came to put a stop to the work of the Board.

VII. Sheffield Board of Management.[1]

The organization of the Sheffield district, the stronghold of Messrs. Vickers, Firth, Hadfield, and Cammell Laird, the great armament firms, presented peculiar difficulties. Outside the firms already enumerated and a few others whose names will readily suggest themselves (Messrs. Steel, Peach & Tozer, John Brown & Company, &c.), the engineering works, though considerable in number, were small,[2] and were already largely employed on sub-contracts for the big firms, some of whom had between thirty and forty houses working for them.

The non-armament firms were eager to undertake independent work, and the possibility of forming a group was discussed at a meeting of their representatives convened by the Board of Trade on 29 March, 1915. Professor Ripper, Professor of Engineering in Sheffield University, was present, and offered a free training in the University workshops in the use of a lathe so as to ensure a supply of trained labour. A small committee was appointed to make investigations, but, in view of the War Office decision, made about this date, that no fresh contracts should be placed within twenty miles of an armament firm, the matter had to be dropped.

The question of organizing surplus capacity was successfully revived a few weeks later owing to the change of policy at headquarters, by which it was decided to abolish the twenty-mile radius. This time the armament firms, under the leadership of Colonel Hughes, President of the Sheffield Chamber of Commerce, took a prominent part. The labour difficulty was likely to be a main obstacle at this time, for it was estimated that 36,000 men, many highly skilled, had left the district. Relations between employer and employed were, however, peculiarly good in Sheffield, and from the first the armament firms associated labour with themselves in the movement, the deputation from Sheffield which was interviewed at the War Office on 22 April, 1915, consisting equally of representatives of the big firms and of the unions. After a general discussion with the Armaments Output Committee and an interview with Lord Kitchener, this deputation went away with a recommendation to set up as soon as possible a joint committee to exploit the resources of the smaller firms.

The Sheffield Committee on Munitions of War was accordingly set up at a meeting of Sheffield engineers held at the Cutlers' Hall on 30 April, 1915. Its first act was to appoint nine of its members to form

[1] D.A.O./3/14, 524; D.A.O./Misc./1394; HIST. REC./R./1121·23/12.

[2] There were, it was computed, about 80 small firms employing any numbers varying between 2 and 30 men.

a joint committee with nine members appointed by labour. Its second was to nominate a special executive committee to investigate the number of machines and lathes available. The researches of the latter resulted in offers of assistance from 27 firms with a capacity of about 200 lathes.

The general committee, which was mainly, but not entirely, representative of the larger firms, was at first anxious that the lathes should be removed to the armament workshops, but, as the machines in question were already employed part time, their removal would have resulted in considerable dislocation of trade, apart from the natural objections which would be raised by the firms concerned. The executive committee therefore strongly recommended the formation of a Co-operative Group, and their scheme was eventually accepted by the armament firms, who in a conference with the committee on 2 June promised to support it with help and advice.[1]

Save in an advisory capacity, the Sheffield Munitions Committee, and with it the armament firms, now passed out of the scheme. and the headquarters of the organization were transferred to the offices of the Applied Science Department of Sheffield University. Five members of the executive committee and an honorary secretary were nominated as a Board of Management[2] to sign the official agreement with the Ministry. This was more as a matter of form,[3] as was recognised in May, 1917, when the remaining members of the executive committee, who had continued to take an equal share in the work, were added to the Board. Colonel Hughes acted as Chairman until his death in January, 1917.

Under their agreement with the Ministry, signed on 18 August, 1915, the Board undertook to provide weekly by co-operative methods 400–500 6-in. shells, 3,000 18-pdrs., 1,000 fuses, 1,000 gaines, and 2,000 primers.[4] The shell side of their work did not prove capable of much expansion, though a total of nearly half a million shells of various kinds was ultimately produced.[5] The production of munitions other than shell, however, was exploited with conspicuous success, and trades of the most varied character were, after instruction from the committee, enabled to turn over to them. The silver trades, for example, produced 1,017,000 fuse body stampings and 975,000 shrapnel-proof helmets; the cutlery, spoon and fork makers between them made 793,000 shrapnel disc stampings, the small wood-making firms made 260,000 grenade, shell and bomb boxes, while iron foundries and small engineering works turned out between them millions of hand grenades, Stokes bombs, fuses, and many other components.

---

[1] Messrs. Vickers and other firms promised to help with the installation of shell-turning demonstration plant at the University, and to provide bar for firms beginning on shell.

[2] See Appendix IV.

[3] See above, p. 30, as to numbers allowed on a Board of Management.

[4] The Board controlled what was known as an Assisted Co-operative Group, receiving a loan of £5,000 from the Ministry; free of interest.

[5] See Appendix V.

The work undertaken by Sheffield University demands special notice. In the experimental days a plant for demonstrating shell turning was installed, and classes were instituted which provided important additions to the skilled labour of the district. The workshops of the Department of Applied Science were utilised not only to manufacture a small quantity of 18-pdr. shell, for which the Department took its own contract under the committee, but also for the production of gauges at a time of great scarcity. The Non-Ferrous Metals Department of the University also collaborated with the committee in the production of brass cartridge discs, advising and instructing a number of firms in the delicate operation of melting and rolling the metal.

In addition to assisting in the actual production of munitions, the committee undertook work for the Badge Department, all applications at one time being examined and certified by them. In the same way they reported on the need of exemption for skilled men in certain special branches of the Sheffield steel trades, and acted in an advisory capacity to the local munitions tribunal.

The perceptible fall in the output of the committee during 1918 was a justification of their work, for it meant that a large number of firms hitherto working under them were now sufficiently reliable to be entrusted with direct contracts.

VIII. Wakefield Board of Management.[1]

The work of the Wakefield Board is unique among Co-operative Groups, for it alone carried out a scheme for the manufacture of the shell complete, except for the charge, producing between June, 1915, and November, 1918, a continuous supply of 18-pdr. shrapnel forged, machined, and filled with bullets by their contractors. This triumph of co-operation was attained, especially in the early days, by diverse and unusual methods ; to produce shell forgings, for example, a large press designed for the pressing of steel boats and a 1,250-ton wagon-wheel press were adapted until such time as suitable presses could be obtained.[2]

Wakefield was among the first to organise its resources, and on 16 April, 1915, a small Munitions Committee was elected at a meeting of manufacturers convened by the Mayor of Wakefield. It immediately set to work to compile an inventory of local machinery. Investigations made in this connection showed that all firms were engaged, directly or indirectly, on War Office work, and that it would be unwise to remove any plant. This reason, combined with the necessity of disturbing labour as little as possible, decided the committee to promote co-operative work rather than establish a National Shell Factory, and throughout April and May they organised the former type of scheme.

[1] D.A.O./Misc./308, 1394; D.A.O./3/246, 338, 506; Hist. Rec./R./1121/48.

[2] This makeshift arrangement proved so successful that when in 1916 the Ministry instituted a general rule that all forgings must be purchased direct from them it was relaxed in favour of the Wakefield Group (D.A.O./3/338).

On 28 May, 1915, an offer to provide forgings for, machine and assemble 2,000 18-pdr. shell weekly was accepted in general terms by the Armaments Output Committee, with whom the Wakefield Committee had been for some time in correspondence. Finally, on 12 June, 1915, an agreement was signed between the new Ministry of Munitions and the Wakefield Committee (whose members became, *ipso facto*, a Board of Management),[1] and, within a fortnight of signing, the Board reported that the output of forgings had already begun. This contract did not arrange for the filling of the shells with bullets, and was superseded by a new contract, signed 10 September, 1915, under which the Board undertook this additional operation.

The original contract undertook an initial weekly delivery of 2,000 shells, rising to 5,000 as soon as possible. The lack of gauges held up progress, and the first delivery of shell was not made until the beginning of October, 1915. Once begun, however, output steadily increased, attaining the promised maximum before the close of 1915, and shortly before the Armistice 17,016 shells were manufactured in one week.[2] The Co-operative Group producing these results consisted of fifteen firms scattered over a wide district. Two contractors undertook to make the necessary forgings, while the machining and filling operations were distributed among the others. Finally, the shells were collected at two centres where Government bond rooms were provided for the final inspection. The Wakefield Board assumed complete responsibility for every stage of manufacture, remaining throughout in the position of direct contractors to the Ministry, their position with regard to the Co-operative Group being rather that of Directors of one large works.[3] They were justified by the results, for only two lots of 500 shell each (or a percentage of ·041) failed to pass the firing test on a total output of 1,184,100.

---

[1] See Appendix IV.

[2] For the total output see Appendix V.

[3] For the general relations existing between Boards and their contractors see above pp. 34–44.

CHAPTER X.

THE MIDLANDS (AREA IV.)

I. The Leicester Armaments Group.[1]

To Leicester belongs the distinction of having formed the first Co-operative Group for the manufacture of munitions, and this gives peculiar interest to its early history. The movement dated from January, 1915, when Mr. Handley, the manager of the local Labour Exchange, attended a meeting of the Leicester Association of Engineering Employers in order to urge on them the necessity of drafting their skilled men to the armament firms. The suggestion was much resented by the employers, many of whose machines were already lying idle for lack of the necessary labour to man them, and nearly all of whose output was concerned with work urgently needed for war purposes, such as the manufacture of boot and hosiery machinery, needle-making machinery, and motors. In the course of the discussion which took place, Mr. Dumas, a member, outlined the co-operative work on munitions which was being done in France.

As a result of this meeting the Association offered its services in February to the Government to organise some scheme whereby the efforts of individual firms could be combined and co-ordinated so as to produce the most satisfactory results. The expedient of creating groups for shell-making was also put forward by the Divisional Labour Exchange Officer for the Yorkshire and East Midlands Division, and Major-General Mahon, of the War Office, who was consulted by the Board of Trade on this proposal at the beginning of March, saw no objections to the principles involved in such grouping.

The scheme was definitely set on foot at Leicester at a meeting of engineering employers summoned on 23 March by the Association of Engineering Employers acting in co-operation with the Local Board of Trade officials. The chair was taken by Mr. J. A. Keay, then President of the Association, to whose efforts, combined with those of Mr. Dumas and Mr. Handley, the successful inauguration of the scheme was largely due. Major-General Mahon, who was present, threw some doubt on the scheme. He said that the War Office intended to support, in the first instance, the existing armament firms, and if Leicester firms formed a group they would have to rely on themselves for labour, materials, and probably supervision. The employers were convinced, however, that, provided the different firms were willing to pool their

[1] Vol. I., Part III., Chap. I.; Hist. Rec./H./1121·24/3; D.A.O./4/489, 1098; D.A.O./Misc./1394; Hist. Rec./R./1121/29.

resources, local manufacture of from 500 to 1,000 shells weekly could be accomplished, and it was resolved to proceed with the scheme. Fifty-four of the 94 firms represented at the meeting promised to assist. The scheme received the warm support of the newly formed Armaments Output Committee, and on 30 March a deputation from the new group submitted their proposals to the War Office, and received their first order for a weekly output of 4·5-in. shell.

After arriving at the understanding with the War Office, the Leicester Engineering Employers' Association, who had hitherto conducted affairs, elected a committee, composed equally of members and non-members, to carry on the work of organisation. The powers entrusted to the committee were very wide, inasmuch as each firm bound itself to place a definite portion of its plant at the committee's disposal and to accept any payment which the committee thought fit to allow. The committee set to work with great vigour; premises to be used as offices and clearing house for the group were secured on advantageous terms from the Corporation Tramway Committee, a preliminary purchase of forgings was made, and the committee individually and collectively made itself responsible for an overdraft amounting to £10,000 at the bank. All available plant was inspected by Mr. Dumas and, by dividing the operation for the complete manufacture of shell into 17 processes, he "balanced" the various tools so that no plant already required for Government purposes should be interfered with. By the middle of April work had been definitely allotted to 84 tools distributed over 26 firms with an estimated production of 900 shells a week.

About this time, having gone into the group arrangement very fully, the committee obtained legal opinion and were informed that in order to avoid possible infringement of the company laws it would be advisable to form themselves into a limited company. A company was accordingly formed, the Leicester District Armaments Group, Ltd., in which the committee were the sole shareholders, with a nominal capital of £5, of which the sum actually subscribed was 36s. only. With this small capital the Leicester Group were able to produce a turnover of more than £1,750,000—an interesting instance of the elasticity of the English Company Law.

In May the question was broached of the formation of a local Munitions Committee of a representative type, as had been done in other districts. The Leicester Group was of opinion that such a committee would serve no useful purpose and might increase rather than diminish labour difficulties, and the matter was allowed to hang fire until the close of June. The Ministry of Munitions, anxious to bring the district into line with the organisation by this time established throughout the country, then asked the committee of the Leicester District Armaments Group to form the employers' section of the proposed Munitions Committee, while the Leicester Federation of Trade Unions chose labour representatives. The group agreed, and a Munitions Committee on these lines was chosen for Leicestershire,

Northamptonshire and Rugby, early in July, 1915. Its main work was the nomination of a Board of Management on 12 July,[1] having its headquarters at Leicester, after which it gradually ceased to meet.

The principal concern of the Leicester Board of Management was henceforward with the affairs of the group, but it also placed a certain number of independent contracts in the district. The manufacture of components was taken up in 1915, and small contracts for H.E. shell were added from 1916 onwards. In December, 1917, the number of contractors to the board was 26, and represented a weekly output of 250 6-in., 1,000 4·5-in. H.E., 3,000 18-pdr. H.E., 50,000 small components, besides small quantities of proof shot.

Meanwhile the Leicester Group had transferred their contract, which, as has been shown, had been made direct with the War Office, to the Leicester Board of Management, through whom the group henceforward received payment for shell, though they maintained direct relations with the Ministry of Munitions for the supply of materials. The group received their first forgings for experimental purposes in May, 1915, and six completed shells were sent to Woolwich for approval at the end of July. The first "lot" of shell was delivered on 12 September, 1915, and it is claimed that these were the first 4·5-in. H.E. shell delivered by any English organisation outside the armament firms. Output rose steadily; in June, 1915, the contract was increased to 2,500; during 1916 this number was doubled, and at the time of the Armistice the group was turning out 8,000 4·5-in. H.E. a week. In the summer of 1916 the group's committee arranged for the manufacture of 6-in. H.E., and attained an output of 1,500 a week.[2]

The Leicester Group furnishes perhaps the most remarkable instance of co-operation which local organisation produced. The group was composed of 80 members (of whom three withdrew quite early in the scheme) belonging to the towns of Leicester, Hinckley, Loughborough, Northampton and Kettering. The contract was distributed among these members and the shells passed in process of manufacture from one shop to another till finally finished. This was bound to add to the time taken in manufacture, while the expenses of handling and transit were greatly increased. An elaborate transport scheme between the different shops was organised by the committee for the group, which, added to the ever-growing experience of firms in repetition work, helped to counteract these drawbacks, and the committee was enabled throughout to pay members a fair price for their work and retain a small surplus as working capital.

II. Birmingham Board of Management.[3]

(*a*) Pre-Ministry Organisation.

The Birmingham district was one of the first engineering centres to be organised by the Government for the spread of munition work, for although important armament works had very large interests in

[1] See Appendix IV. Leicester was one of the Boards which had a labour member, elected at the express wish of the employers present.

[2] See also Appendix V. [3] Hist. Rec./H./1121·24/6; D.A.O./Misc/1394.

the town, there was also ample engineering capacity which these works did not touch. In March, 1915, therefore, one of those exhibitions of shell arranged at this time by the Board of Trade and the Master-General of the Ordnance, was held at Birmingham in order to rouse local interest, and also enable manufacturers to form some idea of the possibility of taking up ordnance work.

Following on this exhibition a meeting of Birmingham employers was convened on behalf of the War Office, attended by Major-General Mahon as representing the Master-General of the Ordnance. His main suggestion was that a local labour battalion should be organised which could be sent to help armament firms as and when required. The manufacturers showed that any attempt to draft labour away from Birmingham would be deeply resented, but at the same time there was a general desire expressed to help in the national crisis, and on 13 April a deputation, representing various Employers' Trade Federations, which included about 300 of the most prominent Birmingham firms among their members, visited the Armaments Output Committee prepared with a well-devised scheme. The main points of this scheme, which had been prepared by Captain R. S. Hilton of the Birmingham Gas Department,[1] were :—(1) The appointment of a committee to be composed of five Birmingham business men and a War Office representative to act for the district ; (2) this committee should (*a*) fix prices and issue orders, (*b*) organise through the Employers' Federations trades to produce the output required, (*c*) advise the Armaments Output Committee on labour questions and control transference within the district, (*d*) commandeer, if necessary, the whole output of certain works ; (3) the scheme laid down that there should be no interference with existing Government contracts.

After a general discussion the deputation was empowered to call a representative meeting at Birmingham with a view to organising the district somewhat on these lines. The meeting was held on 19 April, and was addressed by Lord Elphinstone, who explained that the aim of the Government policy was, while upsetting legitimate and necessary trade as little as possible, to suspend unnecessary civil work in order that the factories thus set free should co-operate in the manufacture of shells and fuses. At the same time, and this specially affected Birmingham, contracts already in hand for neutral countries or for Allies must be completed. A local Munitions Committee composed of ten employers and three representatives of labour was then formed, and from it a small executive, of which Mr. Dudley Docker, C.B., was chairman, was selected to carry out the work of organising the district. On 25 April Sir Percy Girouard, fresh from his interview with the Leeds Committee, went down to Birmingham and addressed a meeting of manufacturers, advocating a co-operative scheme and the organisation of a central works for the production of shell on a large scale. This

[1] Captain Hilton was the officer responsible under the Committee on High Explosives for organising, from Birmingham as a centre, the work of the engineers appointed to supervise gas-washing in seven areas. See Vol. VII, Part IV, Chap. II.

scheme combining a National Shell Factory and a Co-operative Group was accepted, and henceforward adopted by the Birmingham Committee.

Specifications, drawings, and memoranda of manufacture for 18-pdr., 4·5-in., and 6-in. shell and No. 100 fuse were next furnished by the War Office, together with quotations as to price, and by the beginning of May experimental work was being done on 4·5-in. shell. The committee now complained that its work was hampered by the indefinite nature of the powers bestowed upon it by the War Office, who had also hitherto refrained from placing contracts suggested by the committee. On 7 May Captain Hilton wrote: "The committee are unable to move and are beginning to feel that the services which they are willing to place at the disposal of the War Office are not required." Complaints from committees that their claims were not receiving sufficiently immediate attention were not unusual at this date, but as a matter of fact the Armaments Output Committee were now confronted by a very serious impediment to the further development of munitions work in Birmingham arising from a contract placed with Messrs. Vickers in December, 1917, by the Russian Government.

Part of this Russian contract, which included 2,000,000 18-pdr. shrapnel shell and 3,000,000 fuses, had been assigned by Messrs. Vickers to the Wolseley Motor Company, Birmingham, who offered an output of 30,000 18-pdr. shrapnel a week between April and December, 1915, representing, that is to say, half the shell side of the contract. Captain Hilton had drawn the attention of the War Office to the Wolseley Motor Company's contract in April, but it was then confidently expected that it would not interfere in any way with the proposed co-operative scheme. At the beginning of May, however, matters assumed a grave aspect. The Wolseley Motor Company, whose original estimates for delivery had already been revised several times, now reported to Messrs. Vickers that the opening of another shell factory in Birmingham would be a very serious matter. They had already found it extremely difficult to get labour, and as soon as the first lot of Russian shell was passed they would be needing it in increased numbers. The Birmingham Small Arms Company's new factory, too, would be, at a very early date, drawing from the same class of labour. Lord Kitchener was very definite that nothing must be done which would injure the Russian contract, and at one time it seemed possible that the idea of placing fresh orders in Birmingham must be abandoned. At his request Mr. Booth investigated conditions on the spot, to find that no deliveries were possible before June, 1915, and the most sanguine estimate of output appeared to allow for delivery of less than half the promised number by the close of the year. Messrs. Vickers themselves now revised the position, reducing the Wolseley Motor Company's deliveries to 630,000 shell, and placing reliable contracts elsewhere to make up the deficit. The Wolseley Motor Company on their side undertook, if necessary, to provide labour for maintaining the shell deliveries by reducing their private motor-car output. On 28 May Mr. Booth was informed of this improvement, which appears to have eased permanently the position of the central authorities with regard to the Birmingham scheme.

Meanwhile the work of the Birmingham Munitions Committee had not been completely at a standstill. On 13 May Sir Percy Girouard had once more visited Birmingham to discuss the general position, and as a result the committee was empowered to place immediately certain contracts for 4·5-in. and 18-pdr. shell. The question of a national factory remained to be settled, for although Sir Percy Girouard felt that it offered the best solution for concentrating the scattered efforts of firms inexperienced in shell-making, the committee were anxious not to risk the possibility of further disorganising Government work in the district. The timely discovery by the committee of a Wolverhampton firm who would undertake to supply 12,000 forgings a week, deliveries to begin within six weeks, was communicated to the Armaments Output Committee on 19 May, and it was decided to close with an offer more than sufficient to supply the initial needs of the co-operative group and the national factory

At this juncture a deputation from Birmingham was once more summoned to the War Office, this time to be interviewed by Mr. Lloyd George on 28 May. He informed himself very closely as to the progress which had been made, and was informed in conclusion by Mr. Docker, speaking on behalf of his committee, that there would not be any difficulty in turning out 20,000 shells a week under definite instruction. Mr. Lloyd George's reply is noteworthy: "I am not very happy with 20,000. I know exactly how much I want, and if Birmingham only gave me 20,000 a week, it seems to me I shall be very far short."

(*b*) The Organisation of the District by a Board of Management.

It was now necessary to obtain official approval of the Board of Management, which had already been nominated by the committee, and to conclude the customary formal agreement between it and the new Ministry. A draft scheme was submitted for the approval of the full Birmingham Committee, and, after certain amendments, was returned signed by the Board of Management, who on 17 June, 1915, received official sanction to carry it out.[1]

Under this agreement the Birmingham Board were authorised to rent premises forming part of the Midland Railway Company's works at Washwood Heath, and to equip them as a factory suitable (*a*) for the manufacture of 5,000 4·5-in. shells a week; (*b*) for the completion (nosing and banding) of an indeterminate quantity of 4·5-in. shells and 3,000 18-pdr. shell obtained by co-operative methods. The Board were empowered to place contracts for the various processes of co-operative work, and in certain instances for the complete shell, and were also allowed to purchase all necessary forgings. Other conditions relating to Government control, the disposal of funds, the hiring of labour, &c., were of a general character, and common to all agreements between Boards of Management and the Ministry.

[1] For the members see Appendix IV.

The plans of the Board, especially as regarded the National Shell Factory, were quickly enlarged. In July, 1915, plant for the equipment of a cartridge case shop was purchased. At the same time it was decided to erect a fuse assembly shop for assembling the parts for which contracts were now lavishly placed, while before the close of the year a 9·2-in. shop and a gauge shop were in course of equipment.

Between July and December, 1915, the results obtained by the Board were unequal. From October onwards the outside contractors, both in shell and fuse, began to deliver in steadily increasing quantities, but the National Shell Factory lagged behind, and neither reached the productive stage itself nor was able to make adequate provision for the reception and inspection of contractors' work. In December the Board was interviewed by the Department, and attributed this delay mainly to the non-delivery or diversion of plant ordered; many tools were still undelivered, while others had broken down almost immediately. But these hindrances could only be considered contributory to the real cause of delay, which concerned the factory management, and two members were now added to the Board, whose sole work was to supervise the National Shell Factory. The success of the new arrangement was minimised by the cleavage between the National Shell Factory and other work of the Board, for the main office was established in the Council House, Birmingham, some distance from the factory, which resulted in a lack of co-ordination between the two offices, leading to very serious confusions and delays.

In the spring of 1916 an official inquiry made as to the progress of the Board showed that the disadvantages arising from lack of organisation and experience in the early days were by no means overcome. As regarded the National Shell Factory, the worst hindrance to production was an accumulation, dating from November, 1915, of about 60,000 shell from outside contractors and 25,000 manufactured in the factory awaiting completion and inspection, and it was a moot question whether, until they could be cleared off, the factory had not better cease further production. The lack of co-ordination between the staff of the National Shell Factory and the Board was very evident, and the Director of Area Organisation now intervened to remove the chief causes of administrative weakness. A full-time and salaried secretary, who also acted as manager of the factory, was appointed to the Board, whose work was henceforward concentrated at the factory and not, as hitherto, at the Council House. A special arrangement was also made by which the Inspection Department allowed the factory to send forward 50,000 shells into bond irrespective of cast numbers, and this, combined with active and successful measures now taken by the Board to find outside contractors to complete the accumulation of shell, effectually relieved the situation.

At the same time the relations existing between the Board and its contractors were found to be informal and irregular; extensions had been freely granted to co-operative firms, prices had not been revised, and contracts in many cases rested solely on correspondence and not

on signed formal agreements. It was now enforced that the model contract circulated by the Ministry in September, 1915, should henceforward be used, and triplicate copies of all contracts or letters embodying contract terms should be forwarded to the Ministry.

(c) A Survey of the Work of the Board.

The district controlled by the Board was an extensive one, including as it did the Congleton and Crewe district of Cheshire, Warwickshire (except Coventry), Staffordshire, Worcestershire, Shropshire and Montgomeryshire. At certain places within this wide area local Munitions Committees had been formed in 1915, whose resources did not justify the setting up of Boards of Management. Such committees, formed at Stoke-on-Trent, Walsall, Kidderminster, Burton-on-Trent and West Bromwich, were affiliated to the Birmingham Board and acted, in their corporate character, as contractors to the Board.[1] In this way a small but regular addition was made to the co-operative output of 4·5-in. shell, which could not otherwise have been obtained.

The work of the Board, indeed, has special interest as having retained, more than most, the "co-operative" character with which all Boards started out. The National Shell Factory and the Group definitely co-operated throughout. Although the co-operative production of 18-pdr. shell was provided for in the original agreement with the Ministry, it was not resumed after the general break in 1916 and the main results in co-operative shell were achieved on 4·5-in. shell. A group of some 28 contractors each undertook a small quantity (in several cases not more than 100) of partly machined shell and delivered them to the factory to have the finishing operations performed.

Even more important perhaps was the co-operative work done on fuses, for which in the summer of 1915 there was a specially urgent necessity. The jewellers and light metal workers of the Birmingham district were specially suited for this kind of work. Contracts were liberally placed for components of the fuse, which was ultimately assembled at the National Shell Factory. Primers were also manufactured on the same co-operative lines.

In addition to controlling the work of the National Shell Factory and the Co-operative Group, the Board was responsible for contracts placed for whole shell of various types and for large quantities of other munitions (*e.g.*, cartridge clips), for which a demand arose at different times.

An analysis of the Board's position at the close of 1917, when their work was at its zenith, shows that shell from the National Shell Factory, the co-operative contractors and the direct contractors

[1] The Walsall and West Bromwich Committees formed themselves into limited liability companies for the purpose. Unsuccessful attempts to form local committees were made at Wolverhampton and Nuneaton and an attempt to form a separate committee for Montgomeryshire also failed.

combined was being turned out at the rate of 34,350 a week.[1] In addition the Board was supervising 365 contracts for weekly deliveries of some 6,000,000 fuse and primer components and about 500,000 other small munitions.

Mr. Lloyd George had deplored the maximum of 20,000 shell a week which was all that the Munitions Committee could see its way to do in May, 1915; the efforts of the Board resulted not only in raising this figure as regarded shell by nearly 75 per cent., but also in producing from the surplus capacity of the district a very large and valuable supply of components.

III. Coventry Board of Management.[2]

During the war Coventry, almost more than any engineering centre, gave itself up to the production of munitions. Its resources proved enormous. Apart from the existence of an armament firm, the Coventry Ordnance Works, already in the town, the pre-war industries of motor-cars and motor cycles were equipped with plant which was readily adaptable to repetition work of great precision. Skilled local labour in the same way was adapted for munitions work, and it is Coventry's boast that the first shell delivered to Woolwich manufactured by a private as opposed to an armament firm was a Coventry-made shell. A few facts will illustrate the extraordinary development of the manufacture of munitions in the district between 1914 and 1918; large Government factories employing many thousand people were set up, the output of certain machine tools was nine times greater than in peace, while Coventry became the largest centre of aeroplane manufacture in the country, being responsible for approximately 25 per cent. of the total aircraft production in the country. During this period, too, the population practically doubled itself owing to the influx of munition workers.[3]

Such a centre, then, needed little fostering of latent capacity, which was the main function of the Boards of Management of so many Munitions Committees, and the value of the Coventry Armaments Output Committee rests rather on its early pioneer work of organising local effort than on the actual tale of shell produced under its auspices, though the latter was by no means negligible.

As early as March, 1915, the Machinery, Tool and Engineering Association of Coventry held a general meeting, which passed a resolution to offer every support and assistance to the Government in the organisation of the engineering industry and appointed a committee for the purpose. Mr. (now Sir) Alfred Herbert, a member of this

[1] Of these the National Shell Factory was responsible for 700 9·2-in. and 10,000 4·5-in; co-operative contractors for 9,300, and direct contractors for 5,350 4·5-in. 2,300 6-in., 5,000 18-pdr. H.E., and 2,000 18-pdr. shrapnel. For the total output obtained by the Board, see Appendix V.

[2] HIST. REC./H./1121·24/4; D.A.O./Misc./1394.

[3] Further details of munition conditions in Coventry are given in Vol. V, Part V, Chapter VI.

committee, was interviewed by Mr. Booth at the War Office on 15 April. It was then agreed that while labour was scarce the Coventry Ordnance Works must receive preferential treatment, but the utilisation of other factories must not be overlooked. Mr. Booth suggested the immediate formation of a strong local committee to be made at a representative meeting of the principal manufacturers (both federated and non-federated) which should investigate and report.

The meeting was held on 20 April and elected the Coventry Armaments Output Committee, which was composed of 17 members representative of the most important Coventry firms.[1] This committee was invited by the central Armaments Output Committee on 15 May to send in proposals either for a National Shell Factory or for work on co-operative lines. They ultimately chose the latter, and on 11 June a contract to produce 100,000 18-pdr. shell was signed by Mr. Herbert as Chairman to the Coventry Committee and sent to the War Office, by whom it was approved and returned to the committee.

Under this contract a sub-committee was empowered to act as contractors to the War Office and as trustees for the Coventry Armaments Output Committee and was in essence a Board of Management,[2] though through an oversight Ministerial approval was not received until 30 September, 1915. To enable the trustees to purchase raw material and carry out preliminary work, the Government advanced £15,000 free of interest, which was recovered on the last 20,000 shell delivered under the contract. The price, as suggested by Coventry itself, was to be 18s. per shell, which compared very favourably with the lowest scale, 22s. per shell, hitherto offered by other Boards.[3] This contract was of great educational value to local contractors, for the Board's engineer was in constant attendance upon the manufacturer, process by process, and saw to the proper interpretation of drawings and specifications, and ultimately inspection.

The activities of the Coventry Board of Management group themselves naturally into two classes dealing with :—(1) those contracts placed directly with the Board by the Ministry ; (2) those contracts which the Board itself placed in the Coventry district.

To the first class belong the early assisted contracts on co-operative lines for 18-pdr. H.E. shell. The contract for the former was dispersed by the Board among some 27 sub-contractors, who undertook weekly deliveries varying from 50 to 3,000 shell. Each firm made the complete shell up to the banding or varnishing, which was done at a

[1] The Coventry Ordnance Works, Calcott Bros., Coventry Chain Company, Dunlop Rubber Company, Daimler Motor Company, Alfred Herbert, Ltd., Humber Company, Rover Company, Rudge-Whitworth, Siddeley-Deasy & Company, Smith Stampings Company, Standard Motor Company, Swift Cycle Company, Triumph Cycle Company, Webster & Bennett, and White & Poppé, were all represented.

[2] See Appendix IV.

[3] The agreement provided that after completion of the first 10,000 shells the price should be open to reconsideration, with the result that it was ultimately raised to 20s.

central assembly store placed by the Corporation at the Board's disposal for a nominal rent. Deliveries began in August and the contract for 100,000 shell was completed by the close of the year.

The second class, as the original idea of co-operation in the actual processes of manufacture disappeared, embraced all the later work of the Board. At the beginning of 1917 its contractors were turning out weekly 1,500 4·5-in. H.E., 1,000 4·5-in. chemical, 2,000 2·75-in. H.E., 500 18-pdrs. and, perhaps most valuable of all, a quarter of a million of components, for certain of which Coventry possessed the monopoly. By the end of the year various contractors had fallen out and output stood at 500 4·5-in. H.E., 2,500 18-pdrs. and components as before.[1]

This dwindling of the numbers of their contractors was greatly regretted by the Board, who as early as 1916 approached the Ministry on the subject of their own dissolution, pointing out that the contractors had now learnt their work and the Board had no longer scope for its powers. Sir James Stevenson then strongly opposed the idea that the assistance of the Board could be dispensed with, and the increasing tendency of the contractors to approach the Ministry direct, as their work grew in importance, must be regarded as a natural development of the munitions situation in Coventry.

IV. The Derbyshire Board of Management.[2]

The manufacturers of Derby and the immediate district were among the earliest to attempt the organisation of their resources. On 24 March, 1915, at a special meeting of the Derby Chamber of Commerce, a sub-committee was elected, later known as the Derbyshire Munitions Committee. This committee—which had for its chairman the President of the Chamber, and included the Mayor and ex-Mayor of Derby, the chief engineer to the Midland Railway, the secretary of Messrs. Rolls-Royce, Ltd., in addition to a newspaper proprietor, a leather merchant and a hosiery manufacturer—was considered sufficiently representative, and a meeting called later at the instigation of the Labour Exchange decided to leave matters in its hands.

By the beginning of April, the committee had collected a mass of information as to the resources of the neighbourhood, and applied to the War Office for power to act on it. They had secured the promise of 40 to 50 good machines suitable for 18-pdr. shell work, and proposed to establish a factory at Derby, on the same lines as at Leeds. On 31 May the War Office empowered them to elect a Board of Management and to go ahead with the scheme.

The Derby and District Engineering Trade Employers' Association, who had not been represented at the meeting on 24 March, and whose early offer to the Armaments Output Committee to form a local

[1] The total output of shell during the War is shown in Appendix V.
[2] HIST. REC./H./1121·24/9; D.A.O./Misc/1394.

committee had been overlooked, now began to complain that a Federation representing nine-tenths of the engineering employers of the town had been practically ignored in forming a local Munitions Committee. So strong was the feeling of the Federation that certain members approached the Ministry with a request to be allowed to work in with Birmingham. This was obviously not practicable, and the Ministry interviewed both sides in order to restore harmony. The Derby Chamber of Commerce had been actuated, in organising, by the belief that it was the smaller men who were wanted in this crisis, and that the Federation, composed mainly of large firms, would be out of touch with them. However, the co-operation of the Federation was now sought, and a meeting on 25 June sufficed to establish a satisfactory and friendly relationship.

Meanwhile, the work of the committee had been progressing. Considerable difficulty was experienced before suitable premises, in the shape of the Peel Factory, could be found. On 15 June an approved Board of Management[1] was authorised to manufacture 5,000 18-pdr. shell weekly, a type of shell almost immediately changed over to 4·5-in. H.E.

In the initial stages, the Board of Management escaped some of the troubles common to the times; labour, for instance, was sufficient, and, once started, the factory availed themselves freely of female labour, being among the first to do so. They were not spared, however, the difficulties attendant on delay in the delivery of machinery; on 24 June 14 second-hand lathes only were to hand; at the close of October 75 lathes and other machines were still missing. At this stage the Machine Tool Department accelerated deliveries with good results. On 17 December, 1915, 350 shell had passed preliminary inspection.

The Derby National Shell Factory had perhaps the most successful, certainly the most varied, career of all this interesting group of factories. In April, 1916, when the Board was well on its way to double its contract quantity of shell, the factory was ordered to take on 1,500 4·7-in. lachrymatory shell a week. In spite of consequent disarrangement of plant, the costs for May, 1916, were the lowest in the country for 4·5-in. shell. Owing to the shortage of forgings the factory had to shut down for three weeks, and on re-opening filled in slack time by machining 60,000 6-in. shell heads. In March, 1917, production of 4·5-in. shell again steadily mounted, reaching high-water mark in October, 1917, when the output was 9,000 shell a week produced by 1,100 employees, of whom 87 per cent. were women. A signal recognition of the Board's marked success was given in January, 1918, when they were asked to turn the factory over to the production of aero-engine cylinders for the Air Board. Shell production was now gradually stopped, finally ceasing in September, 1918, and the factory was equipped with the most modern machinery and plant, which at the time of the Armistice had already turned out 28,641 cylinders.

[1] See Appendix IV.

The Derbyshire Board included in its administration the whole county, and no inconsiderable part of its work was concerned with placing contracts with private firms, though no co-operative work in the accepted sense of the word was undertaken. In order to keep in touch with so large and scattered a district, a sub-committee was appointed for Chesterfield and its outlying districts, and local correspondents were established at Ilkeston, Swadlincote and Long Eaton. As the Derbyshire Munitions Committee had surmised, it was with the smaller firms that the Board had mainly to deal.[1] Contracts numbering 211 and representing a turnover of £1,000,000 were entered into, representing a substantial number of 18-pdr. H.E. and shrapnel shell, besides trench warfare supplies and some five millions of components.

Figures illustrating the total output of this Board are set out elsewhere,[2] but a few details as to costs may here be given as illustrating its success. The capital expenditure on the factory was approximately £75,000, the profits earned (as compared with the prices paid to private firms) were £170,213, resulting in a clear profit to the nation of nearly £100,000.

V. The Lincolnshire Board of Management.[3]

Lincolnshire, though mainly an agricultural county, includes within its limits large engineering firms of world-wide importance for the manufacture of agricultural machinery. The result of the war was to close down their export trade, and already in 1914 they had turned over to such Government work as the manufacture of army transport wagons, for which their large wood-working and light metal shops were eminently adapted. As time went on the work undertaken by these experienced firms became increasingly important, and the possibility of displacing other munition work, by diverting any of their surplus capacity to the manufacture of shell, more remote.

A first and vigorous attempt at organisation made early in 1915 proved unsuccessful. On 9 April, 1915, Mr. Booth summoned representatives of leading Lincolnshire firms[4] to a conference at the War Office, whose primary object was to find out whether it was possible to transfer any of their skilled labour to Messrs. Vickers' works at Barrow. The outcome of the meeting was that, owing to the amount of Government work in hand, the idea of transferring labour from Lincolnshire was abandoned, and it was arranged instead that a local meeting to organise co-operative effort should be convened by Mr. Robson, Director of Messrs. Clayton and Shuttleworth.

---

[1] A preliminary contract for 10,000 18-pdr. was given to Messrs. Rolls-Royce, but when the question of renewal was under discussion, the firms alleged pressure of War Office and Admiralty work.

[2] See Appendix V.

[3] HIST. REC./H./1121·24/8; D.A.O./Misc./1394.

[4] Messrs. Clayton & Shuttleworth, Robey & Company, William Foster & Company, Cannon & Company, Ruston & Procter, all of Lincoln, and Marshall & Company, of Gainsborough, sent representatives.

Lincolnshire engineering employers met together on 13 April to discuss plans and to elect a small executive committee. On 21 April a further conference was arranged with the Armaments Output Committee, when the Lincolnshire deputation came prepared to make a definite offer to manufacture 18-pdr. and 4·5-in. shell. Plans for general organisation were at this date in the melting pot and the conference was inclined to resolve itself into a general discussion of the situation. Immediately following on it, Mr. Robson submitted proposals on behalf of the Lincolnshire employers to supply 200,000 18-pdr. shell, either H.E. or shrapnel, and 50,000 4·5-in., deliveries to be spread over 12 months. Before giving a definite order, Mr. Booth arranged that Mr. West should inspect the Lincolnshire workshops, and that Lincoln employers should visit Elswick to discuss matters and view processes.

Mr. West's visit was unavoidably postponed, but meanwhile Lincolnshire engineers were beginning to be doubtful of their powers. On 26 May Mr. Robson wrote that urgent war work had been taken in such increased quantities during the past few weeks as to tax firms to the utmost, although, if the national necessity for shells surpassed other munition work, they were still prepared to face the various difficulties of labour and tools. This letter, coupled with an adverse report from Sir Algernon Firth, who had personally visited Lincoln, forced Mr. Booth to the conclusion that nothing was to be done at the moment, and on 28 May he so wrote to Mr. Robson.

Towards the close of June the attempt to organise the area was renewed. On 26 July a Munitions Committee was elected at a meeting of the Engineering Employers' Association, which worked through a small Executive Committee chosen at the same time. Until there seemed some prospect of Lincolnshire receiving a contract, it was not proposed to nominate a Board of Management.

Early in September the committee reported that while nothing could be expected from the large firms, it had definitely been ascertained that 100 lathes, scattered over various small works, were obtainable, but even had there been a greater number there was little or no labour available. It was hoped, however, to arrange for a small output of 4·5-in. shell. The Area Officials confirmed this report, and on their advice a Board of Management[1] was now submitted for ministerial sanction, which was granted on 14 September.

A further delay occurred, for it now appeared that the firm on whose machinery the committee had largely depended had meanwhile taken a further contract for shell. This meant that the lathes remaining at the disposal of the Board were too few and scattered to attempt 4·5-in. shell. On 19 October the Board at last obtained a contract for 3-in. bombs for the Trench Warfare Department, a type of work well fitted to the district. When this contract expired it was replaced

[1] See Appendix IV.

by a running contract for a weekly delivery of 2,000 2-in. bomb stems, which was cancelled by the Ministry early in 1918. After this date the Board undertook no further work.

The particulars of this running contract furnish proof of how very slight was the surplus capacity of which the Board availed itself. The 2,000 stems were divided among 11 firms, of whom Messrs. Clayton and Shuttleworth took 1,050; the remaining 10 firms were only able to tackle this comparatively simple munition in small numbers ranging between 50 and 250 weekly.

VI. Nottingham Board of Management.[1]

The possibility of adapting to purposes of munitions the type of machinery which Nottingham, as a centre of the textile trades, was known to possess, was early investigated by the Government's Factory Inspectors. The results indicated that though there was little prospect for heavier shell, it seemed possible that the available machinery might well be turned over to the manufacture of small arms.

The manager of the Labour Exchange, accordingly, on 31 March, 1915, called a meeting attended by between 30 and 40 representatives of local engineering or machine building firms. A Munitions Committee was elected to exploit the resources of the neighbourhood, and a month later informed the War Office that they were prepared to make proposals. The Armaments Output Committee was then in process of synthesising the schemes of the various areas, and these proposals were deferred until they should be dealing with the Nottingham district. The question was re-opened at the close of May, when the committee communicated their resolve to establish a National Shell Factory. On 4 June they were given conditional permission to proceed with preparations for a factory to manufacture 1,000 4·5-in. shell a week, the type of shell being, however, almost immediately changed to 13-pdr. as more suitable to their light machinery.

On 12 June the Secretary of the Army Council granted authority to proceed to a Board of Management nominated by the Munitions Committee, who had already secured the option of suitable premises. This Board was not considered locally to be fully representative, and was reconstructed with the consent of the Ministry on 12 July.[2] At the same time a fresh contract was drawn up to enable the new Board to carry on the work of their predecessors.

By the beginning of October, 1915, work had fully started at the factory, and on 7 December the first truck load of shell was despatched. Meanwhile, in August, the Board had obtained an extension of its agreement with the Ministry by which it was authorised to obtain shells by co-operative methods within the area of the county.

---

[1] HIST. REC./H./1121·24/7; D.A.O./Misc./1394; HIST. REC./R./1121/29.
[2] See Appendix IV for the members.

The work of the factory and group were henceforward closely allied. Up to September, 1916, 13-pdr. shell was manufactured, the factory attaining an output of 4,000 shells, besides copper-banding, base-plating, varnishing and finishing 5,000 shells produced by co-operative firms. After a short period on 2·75-in. shell, the plant of the factory was completely changed for 18-pdr. shell, which was produced down to the period of the Armistice. In the same way the co-operative contractors turned over to the machining of 18-pdr. shell, and in September, 1918, the Nottingham Board was responsible for a maximum output of 19,900 shells a week. A certain number of components were also being supplied.[1]

The Board has to its credit the production of nearly one and a half million shells. This must be considered a notable achievement when it is remembered that more than half were produced by a co-operative group of some 12 firms, whose individual early capacity did not in many cases equal 100 shells a week.

VII. The Oxfordshire Board of Management.[2]

The organisation of a Group for the Oxfordshire district was carried through, somewhat late in the day, by the Secretary of Area 4. The task was in many ways a thankless one, for though there was local enthusiasm, the district was essentially agricultural and available machinery was widely scattered.

As early as June, 1915, the Mayor of Oxford approached the Ministry with offers of help, which did not in the opinion of the Ministry then justify any organisation of Oxford as a separate unit, and the matter dropped. Shortly afterwards some attempt was made to organise resources in the neighbourhood of Banbury and Brackley, but local differences appear to have prevented a committee being formed in either of these places.

In the beginning of September, 1915, with the assent of the Ministry and in response to repeated local requests, the task of organising the county was renewed by the Area Office at Birmingham. The method adopted was to take, as units for the county, Banbury, Brackley and Oxford, and form small local committees which would later become sub-committees of one committee representing the whole county. Munitions Committees were accordingly elected for Banbury and Brackley on 20 September, at meetings attended by the Area Officials and presided over in each case by the local Mayor. On 21 September a similar committee was appointed for Oxford.

Investigations served to confirm the scanty nature of the available resources. Banbury, where all engineering works of any size were already giving 95 per cent. of their time to war-work, offered seven lathes and three drilling machines, while Oxford had from 10 to 15

[1] See Appendix V.
[2] Hist. Rec./H./1121·24/5; D.A.O./Misc./1394.

lathes and 10 drilling machines available. Brackley had only six lathes, and it seemed improbable that it could undertake any work. The only class of shell suitable for the light lathe which predominated was the 18-pdr., and the most liberal estimate gave an output of 1,000 weekly of which Oxford might be expected to furnish 500.

This estimate did not in the opinion of the Ministry justify the placing of a contract, nor in consequence the appointment of a Board of Management, and inquiries were made with a view to affiliating the Oxfordshire district to some neighbouring Board already manufacturing 18-pdr. shell. The Leicestershire Board was asked to take in Oxfordshire, but refused on account of inconvenient railway communications. The Coventry Board also refused for the same reason, but suggested as a solution of the Oxfordshire problem that trench warfare work was undoubtedly the most suitable for such a district. The idea appeared an excellent one to the Ministry, and it was arranged that a member of the Trench Warfare Department should investigate. He reported adversely on the Banbury district; at Oxford on the other hand he found conditions suitable, and placed with four firms a joint experimental contract for 14,000 3-in. Stokes bombs at a rate working up to 1,000 per week.

With the placing of a contract the time had arrived to appoint a Board of Management, and on 25 October the Area Secretary was instructed to see that the local committee should select one, three representatives of which should represent the Oxford Committee, and the fourth the Banbury and Brackley Committees. The Board received ministerial approval on 23 November, 1915.[1]

Within the limitations imposed by local disabilities the work of this Board was successful. The work done on 3-in. Stokes bombs was throughout satisfactory; on the completion of the first contract it was reported that there were only 1 per cent. rejections, and these only needing slight rectifications. The weekly output varied between 5,000 and 8,000, and the Board also contracted with the Trench Warfare Department for a running supply of boxes for the shell.

The Ministry also contracted with the Board for small quantities of components. In August, 1917, a contract was also placed for mine sinkers, and output, beginning at 50 weekly, was increased to 1,700 by July, 1918.

---

[1] For the members see Appendix IV. In May, 1916, as Banbury and Brackley had been unable to undertake any munition work under the Board, their representative withdrew.

CHAPTER XI.

THE SOUTH-WESTERN BOARDS (AREAS V & VI).

I. The South Wales Boards of Management.

(*a*) The Welsh National Committee for Munitions of War.

The rich coalfields of South Wales and Monmouthshire have shaped the industrial history of the district. The ports have been developed, for the export of iron and coal, the principal industries are connected with iron foundries, copper-smelting and tinplate works: Newport alone has engineering works of any importance. While, therefore, their industrial activities played a very essential part in the prosecution of the war, South Wales and Monmouthshire had very little spare capacity to turn aside to the direct production of munitions. The district was nevertheless among the earliest to exploit its resources.

On 21 May, 1915, Lord Kitchener asked Lord Plymouth, Lord-Lieutenant of Monmouthshire, to summon a meeting of the principal steel-makers and engineers of South Wales and Monmouthshire to determine whether there was sufficient spare machinery to start a national factory for 18-pdrs. on the same lines as at Leeds.[1]

The organisation of this area had already been occupying both the central authorities and local representatives. At this date Newport, whose Chamber of Commerce had been in correspondence with Mr. Booth since April, had arrived at the stage of electing a committee, a number of Cardiff engineering firms had been reported as both willing and able to undertake 18-pdr. shell manufacture, while Ebbw Vale had received a trial order for shells as far back as January, 1915.[2]

On 27 May the suggested conference was held at the Town Hall, Cardiff, and was attended by about 120 representatives both of the leading steel makers and engineers in South Wales and the trades unions concerned. Lord Plymouth emphasised the importance of co-operation with labour and expressed the hope that Monmouthshire would join with Cardiff in forming a Munitions Committee for South Wales. Mr. Brownlie, President of the Amalgamated Society of Engineers, also addressed the meeting in favour of relaxation of labour regulations. A committee, to be known as the Welsh Committee for Munitions of War, was then elected, from whose members the following Executive Board was elected:—

Col. J. R. Wright, Chairman (Baldwins, Ltd., Swansea).
Mr. J. C. Davies (Port Talbot Steel Company).
Mr. C. A. James (A.S.E.).
Mr. J. Hodge (Steel Makers' Association).
Mr. F. Taylor (Taylor & Sons, Briton Ferry).
Mr. Trimmer (Usk Side Engineering Company, Newport).
Mr. L. Diamond (Diamond & Company, Cardiff).

---

[1] D.A.O./5/502.
[2] Hist. Rec./R./1121·25/4; 94/S./620.

Monmouthshire, as a whole, however, claimed the right to set up a separate committee, partly on account of strong local feeling, partly on account of their preponderating capacity for the output of munitions. The Monmouthshire War Committee, consisting of leading business men and six representatives of labour, was accordingly appointed on 31 May at a meeting largely attended by representatives of the Monmouthshire steel, engineering and labour organisations.

Various schemes for the establishment of national factories were considered by the National Committee and it soon became evident that a main difficulty was likely to be lack of machinery. At the beginning of June, when Mr. Lloyd George paid a visit to the committee at Cardiff, negotiations were on hand for Government factories at Ebbw Vale and Uskside, while Swansea and Cardiff were also anxious to exploit their resources in a similar manner.

On 11 June Mr. Lloyd George addressed the Munitions Committee at Cardiff. He thanked them for the response they were making, and outlined the methods taken by France and Russia to meet the enormous demands for ammunition by utilising private workshops. He said it was for them to decide as to whether a local "arsenal" or shell turned out in their own works was better suited to their district. Questions of a technical character were answered by Sir Percy Girouard and Mr. West, who also met the members of the committee at a second meeting on the same day. They were in favour of concentrating resources on two, possibly three, factories, as were also the committee, though some objection was taken by members to equipping Ebbw Vale and Uskside factories with machinery from Cardiff.[1]

The question of organisation was also discussed, and it was decided that sub-committees would be required to work districts varying so greatly in character. The South Wales Area was accordingly broken up into three districts, an Eastern, Western and Central, and separate sub-committees appointed to administer them. This division, too, simplified the question as regarded Monmouthshire, which could now, as the Eastern district, be organised independently, and on 18 June the committee co-opted all the members of the recently formed Monmouthshire Committee.[2]

These sub-committees took an active part in the establishment of the Boards of Management subsequently set up in South Wales. The value of the committee as thoroughly representative of employers and labour was recognised and it was never disbanded, though from 1916 onwards its functions were purely advisory.[3]

(*b*) The South Wales National Shell Factories.

Although the whole of South Wales was thus grouped under one committee, the work of its three subdivisions remained individual. This was partly because the work undertaken was in every case a National Shell Factory, in itself a self-contained unit. The factories

[1] Hist. Rec. /R/1121·25/3, 4. [2] D.A.O./5/505. [3] *Ibid.*

were doubtless the best means of employing such resources as were available, but at the same time local enthusiasm was so far parochial in its outlook, and disinclined to accept a subordinate position, as to have made a more general scheme impracticable. Six Boards of Management[1] were eventually set up and the history of their administration in (i) the Eastern, (ii) the Central, and (iii) the Western divisions of the South Wales Area has now to be traced.

(i) *The Eastern Division.*—The Ebbw Vale National Shell Factory owed its establishment to an offer, made by the Ebbw Vale Iron and Steel Company, of an 18-pdr. shell shop rent free at their works. At the same time a contract for 1,000 18-pdrs., which they had received from the War Office early in April and for which they had constructed the shop, was to be merged into and form the first delivery of the factory. The offer was accepted, and a Board of Management appointed on 18 June, 1915, of which the Managing Director of the Company was chairman. Ministerial approval was given on 29 June. Shortly afterwards Mr. West authorised a further extension of the scheme to include a 60-pdr. factory to produce 5,000 shells weekly. Ebbw Vale Factory did not fulfil its early promise. Certain inherent disadvantages soon became apparent, and notably that arising from the isolated position of Ebbw Vale, nineteen miles from Newport and with very bad and congested railway communication. Labour had to be imported with consequent heavy expenses of subsistence allowances, while the management were unwilling to dilute, on the plea that male labour was being trained for the projected 60-pdr. factory. The factory, too, found great difficulty with certain processes of manufacture, notably that of varnishing. By the close of 1915 the results began to appear in the shape of short deliveries and exceedingly high costs.[2] Under the circumstances it was considered wiser by the Ministry to abandon the idea of extension and eventually, as costs continued high, the D.A.O. Executive Committee decided to close down the factory itself in July, 1916.[3]

A factory at Newport for 60-pdr. shell, whose career was to be more fortunate, was authorised by Mr. West at the same time as the Ebbw Vale extension. The scheme was administered by the Newport Board of Management, composed of the same persons as the Ebbw Vale Board, but having a different Chairman and Secretary and holding its meetings separately.[4] The premises chosen, namely, the fitting shops of the Great Western Railway Company's engine sheds at Maesglas, though suitable in other ways, were two miles out of Newport, and arrangements had to be made at the Board's expense for a service of motor trains to convey workers to and fro. An auxiliary shop for the production of shell noses which was taken over in 1916 from a firm of ship-repairers was more conveniently situated in the centre of the town.

[1] See Appendix IV.

[2] The deliveries were 1,000 a week instead of 5,000, the costs were 17s. 7d. in November, and 20s. 2d. in December (D.A.O./Misc./238; D.A.O./5/307).

[3] D.A.O./Misc./238; D.A.O.5//307, 505, 143, 215. The 60-pdr. factory was changed over to an assisted 8-in. contract with the firm. The total output of the factory is given in Appendix V.

[4] See Appendix IV.

The equipment of the factory was new, and was not delivered in full until March, 1916, so that first deliveries into bond were not made before June, 1916. From that date production mounted steadily, attaining an output of 7,000 shell a week, until in March, 1918, the Board was instructed to change over to a new mark of shell, and at the same time reduce output. The necessary reorganization was not made without serious dissatisfaction among the workers, but this was overcome, and at the time of the Armistice the factory output was again in process of acceleration.[1]

In addition to running the factory, the Board, from March, 1917, supervised the work of a few local firms contracting for small quantities of components.[2]

The third enterprise undertaken in the Monmouthshire area was unique, for here the Government found a factory and management ready to their hand, and took them over in their entirety. The Uskside Engineering Works dated from 1827, and had made iron cannon during the Crimean War. It was therefore peculiarly appropriate that already by the spring of 1915 the works had turned over to munitions work in the shape of proof shot for naval guns and 18-pdr. shell, and also that it should be suggested by the Welsh National Committee as suitable for one of the Welsh National Factories. The Ministry, in considering the proposal, decided to acquire the works as a going concern during the war, and took them over formally on 1 July, 1915. The Uskside Board of Management, composed of the former directors of the works (to whom was to be added a nominee of the Ministry), was then approved. The diversity of work carried out at the Uskside Works made this factory indeed the Jack-of-all-Trades among National Shell Factories. Not only were considerable quantities of 18-pdr. and 6-in. shell manufactured, but also proof-shot and proof-shot forgings of many types, pedestals for naval guns, gun carriage forgings, breach pieces for trench howitzers, and complete rudders for standard ships, while throughout the war urgent repair work for collieries was continually carried out. The Board also undertook the setting up and supervision of a gauge factory in Newport under the control of the Gauge Department.[3]

(ii) *The Central Division.*—From the beginning, the representatives of engineering firms in Cardiff had evinced a strong desire that such machinery as was available in their locality should be concentrated in a National Shell Factory in their town. On 30 June, 1915, a Board of Management, including a labour member nominated by the Welsh National Committee, was authorised by the Ministry to carry out such a scheme in premises rented for the purpose. Local machines were by no means sufficient, and early hindrances were largely connected with shortage of adequate tools. The labour question, too, was acute here. The factory began with the manufacture of 18-pdr. shell, and the introduction of repetition work in a general engineering neighbourhood

[1] See Appendix V for figures of output.
[2] D.A.O./Misc./1394; D.A.O./5/143, 505; HIST. REC./R./1121/29.
[3] D.A.O./5/505, 510; D.A.O./Misc./1394. Figures of shell output are given in Appendix V.

was fraught with considerable difficulty, for many items which in a manufacturing centre would have been accepted without demur were considered an encroachment on the rights of the skilled workers. It is a tribute to the Board, therefore, that the extent of dilution ultimately reached was 87 per cent.[1]

A further test of the Board's efficiency was the change of requirements demanded by the Ministry. In the middle of 1916 they were ordered to turn over from 18-pdr. shell to 60-pdr. shell heads, necessitating extensive alterations and adaptations of machinery. At the end of the same year, to meet the new demand for 18-pdr. shell, the factory was again relaid on the basis of an output of 5,000 shell weekly, which by November, 1918, had increased to 7,000.[2]

Under their agreement, the Board were authorised to obtain shell by co-operative methods in the Cardiff area, but an attempt to form a co-operative group was unsuccessful.[3]

(iii) *The Western Division.*—On 23 June, 1915, a deputation of Swansea manufacturers placed before the Ministry a scheme for a factory to be established at very suitable premises which one of their number offered rent free on behalf of the Port Talbot Steel Company, and which it was hoped to equip largely from local machinery. The scheme received official sanction and a Board of Management was authorised on 28 June, 1915. In their agreement the Swansea Board undertook to manufacture either 5,000 18-pdr. or 4·5-in. shell as required, but it was decided later to take up both types.

The Board had at first uphill work; machinery which they had hoped to secure for their own factory was diverted to Llanelly, and the early attempt of an inexperienced manager to start work before the factory was sufficiently equipped necessitated the reconstruction of the lay-out in October, 1915. The results of such handicaps were seen in tardy deliveries and heavy costs. Once they were removed the Board administered the factory with noteworthy success; in the middle of 1917 a weekly capacity of 4,000 4·5-in. shell and 2,500 18-pdr. had been attained, and about the same date the costs of manufacturing both types of shell were the lowest attained by any National Shell Factory.

In accordance with its agreement, the Swansea Board also supervised a group of local firms producing a small quantity of 18-pdr. shell and components.[4]

The last of the National Shell Factories in South Wales to be established was at Llanelly, which was nominally in the area controlled by the Swansea Board but had shown a marked disinclination to lend machinery for any outside scheme. The opportunity to set up a

[1] The only department not touched by female labour was the tool room, which was so small as to make it inadvisable to force the question in face of local prejudice.

[2] See also Appendix V

[3] D.A.O./Misc./1394; HIST. REC./R./1121·25/6; D.A.O./5/503.

[4] D.A.O./5/197, 523, 600, 534; HIST. REC./R./1121·25/8; HIST. REC./R./1121/20, 29. For the total shell output see Appendix V.

factory of their own came in September, 1915, when the Director of Messrs. Richard Thomas & Company, who had been in treaty with the Swansea Board for a small contract for 6-in. shell, offered instead the Barry Extension Works, with the standing plant and machinery, rent free for use as a National Shell Factory for that type of shell. The offer was laid before the Ministry on 13 September by a deputation from Llanelly, who further stated that 26 machines, providing about half the necessary equipment, would be supplied locally. They also came prepared with nominations for a Board of Management. The Ministry referred the proposal to the Welsh Munitions Committee, who agreed to nominate the Llanelly Board, which was accordingly authorised on 27 September.

Under their agreement with the Ministry, signed on 23 October, 1915, the Board had undertaken to produce 1,000 6-in. shell per week as soon as possible. Deliveries began in February, 1916, and mounted steadily to 4,500 shells a week in 1917.[1] In September, 1916, the work of the Board was supplemented by the establishment of a rectifying shop on a plot of freehold ground adjoining the factory. A capacity for rectifying 40,000 shell a week was contemplated, but actually the number of shell rectified during the last six months of the war averaged 16,000 weekly.

II. The West of England Board of Management.[2]

The work of the West of England Munitions Committee covered an area which exceeds in size that undertaken by any other local committee, for it organised the surplus capacity of nine counties : Berkshire, Hampshire, Wiltshire, Somersetshire, Gloucestershire, Herefordshire, Dorsetshire, Devonshire and Cornwall.[3]

The task of administering this wide district, where engineering firms were few and far between, presented exceptional difficulties, the solution of which gives a special interest to the early work of centralisation carried out by the committee. A start was made before the Ministry of Munitions came into existence. In April, 1915, the Bristol Chamber of Commerce took up the question of co-operative work ; an interview was secured with the Armaments Output Committee of the War Office, and a meeting, representative of the leading industries in Bristol, was held by the Mayor, when a general committee was appointed.

Meanwhile the West of England branch of the Engineering Employers' Federation had, in response to an appeal from headquarters, also formed a small munitions committee. This committee, representing as it did all the counties in the West of England, eventually took over the whole work of organization.[4] Its members, forming the nucleus from which the later Board of Management was drawn were Messrs. J. P. Brazil

[1] See also Appendix V.

[2] HIST. REC./H./1121·26/1 ; 94/Bds./33 ; D.A.O./Misc./1394.

[3] Cornwall, partly owing to the distance from Bristol, formed an independent Board of its own in October, 1915.

[4] The Chamber of Commerce Committee continued in existence to deal with requirements other than shell. Mr. Brazil was a member of both committees.

(Messrs. Brazil Straker & Company), P. K. Stothert (Messrs. Stothert & Pitt, Bath), and W. Trimmer (Uskside Engineering Company, Newport). By the beginning of June they had arranged with ten firms to co-operate on 18-pdr. shell work, and had negotiated the preliminary terms of a contract with the War Office.

One of Mr. Lloyd George's earliest acts as Minister of Munitions was to visit Bristol, where, on 12 June, 1915, an enthusiastic meeting, representing all the Bristol and West of England firms, pledged itself to him to give the utmost practical support to the prosecution of the output of munitions of war. Following on this meeting a general Munitions Committee, composed of employers and labour from all parts of the district, was formed, and proceeded to nominate a Board of Management,[1] which received its charter from the Army Council on 23 June.

The first thing to decide upon was a suitable administrative centre from which to keep in touch with so large an area. Bristol was chosen and offices immediately set up. The selection of Bristol raised a certain amount of protest from outlying districts, and various suggestions for reorganisation were brought forward during 1915. The work of supervision was, however, partly decentralised by the formation of branch committees working under the Board—some of which were created by independent local effort as early as June—in Cornwall, Portsmouth, Exeter, Southampton, Torquay, and Cheltenham.

The co-operative work on 18-pdrs. initiated by the Board is perhaps its most interesting achievement. In a short time more than 60 firms were induced to co-operate; the largest contractor undertook 500 shells a week, but by far the greater number could only manage 100. Besides strictly engineering firms, other manufacturers having repairing workshops, such as lace makers, biscuit makers, chocolate makers, tobacco manufacturers, paper-bag makers, gas companies, and motor garages, were pressed into the service. In Portsmouth and Exeter local residents formed themselves into limited liability companies, and so became contractors to the Board for small quantities of shell. During the experimental stage members of the Board visited firms, inspected works, and generally assisted manufacturers undertaking contracts.

The copper banding and varnishing of shell under all the 18-pdr. contracts was completed at a finishing factory under the direct administration of the Board. Mr. Lloyd George had strongly advocated the establishment of a National Shell Factory for the district. The Board, who realised that conditions were more favourable to the co-operative side of the work, decided that the best plan was to establish a small national factory, in the first instance as an assembling place for shell manufactured co-operatively, and later to develop its manufacturing side. Sites were examined at Bristol, Swindon and Gloucester, and eventually the lease of a factory formerly used as iron works in St. Philip's Marsh, Bristol, adjoining the Great Western Railway, was secured for the duration of the war, with option of purchase. The

[1] See Appendix IV.

manufacturing side of the factory never eventuated. A certain number of tools had been collected for this purpose by the close of 1915, but the work of completing the co-operative shell was becoming so congested that it was finally decided to abandon the idea of manufacture.

The weekly output by contractors of 18-pdr. shell varied considerably owing to change of programme, falling to 15,000 shell in 1917, and reaching 45,000 in 1918.[1] This rendered it necessary for the Board to organise the work of its contractors so as to enable them to resume shell work when required. This was so successfully accomplished that, when once more there was an increased demand, it was met in full, although many of the larger firms had been turned over to more difficult work and had dismantled their shell-making plant.

In addition to 18-pdr. shell the Board's contractors undertook other shell work, such as 18-pdr. shrapnel, incendiary and night tracer shell, and one firm designed and constructed a type of hydraulically operated shell plant for the manufacture of 18-pdr. and 9·2-in. H.E. shell, with excellent results as regards economy both of time and money.

From 1915, too, the Board also exploited any surplus capacity for the production of component parts; indeed, one firm in the area became the largest producer of primers in the country.

In conclusion, mention must be made of the work done by an organised staff of voluntary inspectors, recruited from all classes of men in the area over military age, who visited the various works and transferred the steel cast numbers and ingot numbers to shell cases during machining. The work, which was arduous and monotonous and often entailed night as well as day work, was very efficiently carried out, and resulted in a considerable financial saving to the State.

III. The Cornwall Board of Management.[2]

Cornwall as a county had not much apparent capacity for the manufacture of munitions; mining was the staple industry: and the few important engineering firms made mining machinery both for home use and for export, while the remaining foundries, scattered over a large area, were too small to undertake independent work. That the county, in spite of so unpromising an outlook, should have been drawn usefully into the national scheme for local organisation was largely the work of two men, Mr. Horton Bolitho, a member of the Penzance banking firm, and Mr. John Gilbert, mining agent to Lord Clifden.

In the spring of 1915 Mr. Bolitho had begun his campaign by a personal inspection of firms to gauge their resources, and had compiled a list of available plant, but he was hampered from making plans by the difficulty of obtaining definite knowledge of War Office requirements. In June it was decided by the Ministry that Cornwall should be included

[1] See Appendix V for total output.
[2] HIST. REC./H./1121·26/2; D.A.O./6/691.

in the district then being organised by the West of England Board of Management. This decision was not welcome to Mr. Bolitho, who was convinced from his knowledge of their independent character that the best results could only be obtained from Cornish firms under conditions of self-government.

The Cornwall Munitions Committee (which had been set up in accordance with lines laid down at a meeting with the West of England Board on 29 June) protested in vain, and in July, 1915, three of the larger firms became sub-contractors for 18-pdr. shell to the West of England Board. The combined output they offered was only 400 shells a week, and the small foundries, from whose co-operation so much had been hoped, took no part at all in shell manufacture, though they undertook work on 2-in. trench howitzer bombs, a contract for which was placed direct with the Cornwall Committee at the end of August.

The Cornish Committee's original desire for independence was not modified by experience and after a few months they once more agitated for a separate existence. They were now seconded by one of the Ministry's engineers, who reported that output could be greatly increased probably to 5,000 shell a week. With these improved prospects the Department was prepared to consider the appointment of a separate Board of Management, and a joint meeting of the West of England Board and the Cornish Committee was held at the Ministry of Munitions on 12 October, when the Cornish Committee's arguments finally carried the day. A Board of Management was accordingly nominated for Cornwall, and received official sanction on 26 October, 1915.[1]

In the agreement which they signed with the Ministry on 8 November, 1915, the Board undertook the work of an Assisted Co-operative Group, receiving an advance of £5,000 for the purpose. Their contract was for 5,000 to 6,000 18-pdr. shell a week and they more than justified their existence by trebling this number, in addition to turning out other munitions. Thus in February, 1917, their contractors were responsible for a weekly output of 10,000 18-pdr. H.E. and 8,000 shrapnel, while small quantities of 6-in. howitzer proof shot and 2-in. wooden plugs were also being produced. In December, 1917, the weekly output of 18-pdr. shell was 12,500 H.E., while the contracts for other munitions had increased to 6,600 6-in. howitzer proof shot, 15,500 sockets for 18-pdr. shrapnel,[2] and about the same quantity of plugs.

These results were not easy of attainment. Only two firms were able to undertake complete manufacture of shell, and the Board had to devise some method of employing the plant scattered among the smaller firms. They decided to organise two small limited liability companies, the West Cornwall Munitions Company, and the Mid-Cornwall Munitions Supply Company. The former of these established a factory at Redruth, where the available plant was assembled, and a weekly capacity of

[1] For names of members see Appendix IV.

[2] In 1918, firms turned over to steel nose bushes instead of sockets. For figures of total output see Appendix V.

3,500 18-pdr. was ultimately attained. The latter equipped a factory near St. Austell, where, during 1916, a steady output of 4·5-in. shell was maintained, but the increasing difficulties of dilution led to its closing down at the beginning of 1917, and the consequent dissolution of the company.

All parts of Cornwall—Camborne, Hayle, Redruth, Wadebridge, St. Austell, Penzance—contributed their quota, and the surplus capacity of every firm was exploited, from the big Camborne foundry responsible for half the output of the group down to the Penzance garage turning out weekly 1,000 shrapnel sockets.

CHAPTER XII.

THE METROPOLITAN AND EAST COAST GROUPS (AREAS VII. AND VII.B).

I. The Metropolitan Munitions Committee.[1]

(*a*) The Formation of the Committee.

The Metropolitan Munitions Committee originally set out to utilise for munitions purposes the large power supply companies in London and later added the exploitation of the smaller manufacturers to its activities. The preliminary action which led to its setting up was taken early in March 1915 by Mr. A. W. Harper, member of a firm of consulting engineers, who then suggested to the Master General of the Ordnance a scheme whereby the electric lighting and power companies should themselves manufacture munitions instead of labour being withdrawn from the central stations as suggested.

During April and May Mr. Harper continued to organise the London area along these lines and met with a very cordial reception from the power companies generally.[2] Towards the close of May the Armaments Output Committee (and more particularly Mr. Ridpath) began to take an active part in the organisation of the Metropolitan Area and Mr. Harper was advised to call a preliminary meeting of the Civil, Electrical and Mechanical Engineers from their several Institutions for the purpose of electing a Munitions Committee. The meeting took place on 5 June, 1915, at the Institute of Civil Engineers and resulted in the election of a committee of which Mr. Hall Blyth, President of the Institute, was made Chairman.

By this time an enormous number of offers of help from small manufacturers and others had accumulated, and at the first meeting of the committee on 7 June, 1915, it was decided to extend its sphere of action and to develop all surplus capacity in the Metropolitan Area. Preliminary investigations were quickly carried out and on 14 June the Metropolitan Munitions Committee submitted proposals to the Ministry embodying their aims and proposed constitution. The general principles established were that complete shell rounds should be supplied if possible, and special attention paid to the manufacture of fuses, gaines and gauges. There was to be no interference with the Government

---

[1] Hist. Rec./H./1121·27/1.

[2] The Manager of the St. Marylebone Electric Supply Station wrote in May, 1915: "We have turners in our station . . . . who can do lathe work. We can neither let them enlist nor permit them to go to an armament factory, but we can make use of them to the extent of four to six hours per day on this work concentrated in our own Generating Station. Further than that, neighbouring Supply Authorities are also sending their men to work on our machines."

Arsenal at Woolwich, with firms in the London area already engaged on Government work or with the necessary work of the Public Utility Services. The powers claimed by the committee included the administration of all necessary funds, the hire or purchase of machines engaged on civil work and the establishment of a suitable engineering, administrative and secretarial staff. Authorisation was granted on 15 June by the Army Council to the Metropolitan Munitions Committee to administer a scheme on these lines through a Trustees and Finance Board nominated by themselves, and was confirmed two days later by the Ministry of Munitions.

On 15 June, Mr. Lloyd George terminated a series of conferences which he had been holding throughout the country by interviewing the newly authorised Metropolitan Munitions Committee. In the course of the interview he expressed great satisfaction at what had been already accomplished and pointed out that very special help was expected from London in the manufacture of fuses and gauges.

(*b*) The Organisation and Work of the Committee.

A highly organised form of administration was now set up. The general committee at first sat weekly but the meetings quickly tended to become formal and in December, 1915, its position as a consultative body only was definitely established. The real business was done by two executive bodies, the Trustees and Finance Board and the Board of Management, working by means of various sub-committees. As already stated, the former controlled and was responsible for the funds supplied to the Metropolitan Munitions Committee and for the general management of the scheme. Quite early in its career it delegated any of the powers contained in its standing orders to the subordinate Board of Management. The Trustees and Finance Board, thus shorn of much of its work, though not of its authority, continued to hold its meetings concurrently with the Board of Management until in June, 1916, the two Boards were eventually amalgamated.[1]

The headquarters staff consisted of (*a*) a General Manager with his assistants and (*b*) a Chief Engineer and his staff, whose combined members as organised in 1915 amounted to some 81 persons.

Local control was secured by breaking up the Area into thirteen divisions, of which ten were included in the Metropolitan Police District and the remaining three represented Kent, Surrey and South East Essex respectively, Each of the districts was controlled by its own Manager and District Board, who were responsible to headquarters, and was provided with a local office and staff. There were also three " Groups," Colleges, the Gas Light and Coke Company and the Metropolitan Water Board, which were directly controlled from headquarters.

The Ministry exercised a direct control over the whole organisation both on its administrative and technical sides. On the administrative side co-operation was secured by the appointment of Sir William

[1] For membership see Appendix IV.

Plender to represent the Government on the Trustees and Finance Board. The position of the committee as the agent of the Ministry of Munitions was also clearly established; all orders for work came in the first instance through the Ministry and during 1916 and 1917 the Contracts, Finance and Area Organisation Departments were represented on a sub-committee of the Board of Management without whose sanction no contracts were placed. On the technical side the committee's work was linked up with the scheme of Area Organisation which was being adopted throughout the country and a chief Superintending Engineer was appointed by the Ministry to exercise a general supervision over the Area, which was known as Area 7B.

This somewhat elaborate organisation was adopted to cope with the peculiar conditions prevailing in the Area. Engineering firms of any importance were by this time mostly full up with War Office and Admiralty work and only the smaller works, scattered over a very wide area and, in normal times engaged in a variety of trades and manufactures, were left for the operations of the committee. Before the close of the year 1915, 3,860 firms had been inspected and orders placed with 470 firms for munitions which included various types of shell besides fuses and gauges. The value of the orders placed was £4,229,277 and, it should be noted, represented a saving of £160,771 on the maximum price allowed by the Ministry. In spite of the hindrances common to all munitions production at this time—delays in receipt of specifications, shortage of material or machinery and inadequate methods of inspection—much of the experimental work had been done and the general scheme was in working order. The question now arose of simplifying a system of local administration which, involving as it did the maintenance of thirteen district offices with their staffs in addition to the committee's head-quarters staff and to the Superintending Engineer and his staff of District Engineers, had become too costly and too complicated. In October, 1915, the Ministry took up the question of centralising the organisation of the Metropolitan Munitions Committee and as a preliminary step decided to withdraw their own Munitions Engineers from the various districts and henceforward to supervise the technical side of the committee's work from Armament Buildings.

About the same time the Director of Area Organisation took up the question with the Metropolitan Committee of the possibility of disbanding the district offices and of concentrating the whole administration at the headquarters of the committee, in Alexandra House, Kingsway. A special sub-committee was asked to report on the whole organisation for this purpose. Their reports showed that (*i*) the costs of administration were approximately £35,000 per annum or about ½ per cent. of the total value of contracts placed, (*ii*) the headquarters staff numbered 147 persons and the local staff 330, of whom 188 were unsalaried, (*iii*) that all the district offices save two were rent free, as were also four out of five of the assembly and storage depots, representing a saving of £10,725 per annum. The suggested disbandment was unwelcome both to the committee and the local Boards; the former considered the action would be undiplomatic as many eminent persons

were rendering voluntary services and very little real saving would be effected as almost all the offices were rent free. The Director of Area Organisation, however, decided that though the expense saved might be small there would be an undoubted gain in efficiency.[1] In March, 1916, the District Boards were disbanded, and a process of gradual absorption began by which districts were either immediately incorporated with headquarters or combined with each other. By September, 1916, the work of the Area had become completely centralised in the head office, and the Metropolitan Munitions Committee themselves testified to the success of the reform, which resulted in a saving to the organisation without in any way weakening its efficiency.

In addition to placing contracts for munitions, the Board of Management of the Metropolitan Munitions Committee was instrumental in establishing one filling factory and two National Shell Factories. Early in August, 1915, the Ministry instructed the Board to make arrangements for the erection of a filling factory for components at Perivale. The preliminaries were carried through in record time: before the close of the month the work of construction was actually in hand, and fuse assembling began on 1 December, 1915. The factory continued to be controlled by the Board until June, 1916, when it was handed over to the Ministry, though the Board continued to supervise the work of construction and equipment which, owing to the addition of large magazine stores and bond warehouses, was not completed till July, 1917. Of the two National Shell Factories, the College Park Works was a small factory taken over from alien enemies under the Defence of the Realm Act in October, 1915, and at first employed as accessory to the work of the Perivale factory and later for the manufacture of shrapnel components. The Ailsa Craig Works were taken over in June, 1916, by the Board, also under the Defence of the Realm Act; in this case, however, owing to the unsatisfactory character of the work being performed in connection with a contract placed with the company for 4·5-in. shell. The Board reorganised this factory with great success.

The expectation of Mr. Lloyd George in June, 1915, that the London area would give special help in the manufacture of gauges, was amply fulfilled. In November, 1915, the Metropolitan Munitions Committee were delivering about 25 per cent. of the total number of gauges ordered by the Ministry. The majority were made by the London County Council's Tramways and Education Departments, the Metropolitan

[1] How the principle of decentralisation carried too far had resulted in an unnecessarily cumbrous form of procedure is illustrated by the method of placing orders at this time. In the first place, requirements were noted to the Board by letter from the Ministry. The General Manager then issued a form to the Chief Engineer and the Chief Accountant; the Chief Engineer then issued another form to each of the District Managers; the District Managers negotiated with their contractors and received tenders; the tenders were examined by the Chief Engineer and endorsed by the Superintendent Engineer for the Area, and also by the sub-committee of the Board of Management; if they were found satisfactory they were authorised by the sub-committees; the orders were then made out in the Chief Engineer's department; finally they were signed by the General Manager and sent direct to the contractor.

Water Works and other public bodies at the low price of cost of material and wages, plus 10 per cent. overhead charges. Up to the end of 1917 the total number of gauges ordered was 88,784, showing, on the basis of prices allowed by the Ministry, a direct saving to the country of some £8,129.

The Board of Management claimed to have inaugurated the compulsory scheme under which swarfe was collected and safeguarded throughout the United Kingdom. Early in 1916 the Board suggested to the Ministry the desirability of the control of swarfe, with the result that a Swarfe Department was created, and the collection and disposal of swarfe in the Metropolitan Area, both from their own and the Ministry's contractors, was entrusted to the Metropolitan Munitions Committee.

(*c*) The Dissolution of the Committee.

In September, 1917, the question of the excessive administrative expenses of the Metropolitan Munitions Committee was raised between the Ministry and the Committee. It was fully recognised that their expenses were necessarily greater than those of other Boards, because of the miscellaneous nature of their work, but the rate now reached of more than 1 per cent. on the total value of orders hitherto placed was considered proportionately too high. It was true that the work of the Board showed a steady increase as instanced by the aggregate output of shell, gauges and components for the four weeks of September, 1916, and September, 1917, when the numbers were 1,315,004 and 2,719,722 respectively. There were, however, other and more far-reaching reasons which confirmed the necessity for further investigation. Owing to the diminished shell programme, arising from the scarcity of steel, there was bound to be lessened output by the Board's contractors, which would mean a disproportionate rise in expenses already acknowledged to be too heavy. A special meeting of the Board of Management was held on 24 January, 1918, attended by Mr. McLaren, when it was acknowledged that reduced output would raise their expenses to an impossible figure as their 400 contractors were likely to be reduced to 100. The question was raised as to whether it would be possible to increase the work of the Board by transferring to it all contracts in the London area hitherto placed direct by the Ministry, or alternatively handing their work over to a Government Department.

A formal report by the committee itself in February, 1918, confirmed the fact that only work of sufficient magnitude would vindicate its continued existence, and it was decided that their work should be transferred to the Ministry. At the same time the Ministry proposed that the Board of Management of the Metropolitan Munitions Committee should remain on in an advisory capacity, but the latter body chose rather to be dissolved as soon as it had completed its obligations to its contractors, which as a matter of fact were still being fulfilled at the time of the Armistice. On 8 May, 1918, the Chairman of the Metropolitan Munitions Committee received the formal letter embodying the

Minister's decision to transfer the work hitherto carried out by them, and speaking in appreciative terms of the work accomplished by the committee :—

> " Your Committee undertook probably the most difficult task that was undertaken by any Munitions Committee in the kingdom when they undertook to organise London firms for the production of munitions. The wide area covered, the diversity of the articles manufactured by the firms in question, the peculiar difficulties of transit, all contributed to the magnitude of the task. The Committee has signally triumphed over all these difficulties, and has achieved an ample and most efficient output of the different stores that are required. They have erected a filling factory ; they have equipped and managed numerous bonds and stores ; they have organised a large mass of transport ; they have got together a staff of the most skilled engineers to overcome technical difficulties, and they have dealt most successfully with the intricate financial and contract matters inseparable from their work."[1]

II. The East Anglian Board of Management.[2]

The first step towards a co-operative movement for the manufacture of munitions in East Anglia was taken in April, 1915, when the Engineering Employers' Federation for the district formed a committee for the purpose. The area controlled by the committee was a wide one, embracing as it did the three counties of Norfolk, Suffolk and Essex, and included various important engineering firms whose peace-time occupations included the manufacture of steam engines, agricultural machinery, wireless installation and electrical apparatus.

The committee, in conformity with War Office instructions, took no action until the middle of May, when they were asked to investigate the possibilities of their district for undertaking either a National Shell Factory or co-operative work. A meeting was immediately called, a provisional executive committee and two managers, Mr. (later Sir Wilfred) Stokes and Mr. F. H. Crittall, to whom the work of organisation was to be largely due, appointed. Between 30 May and 5 June, the managers made a tour of the district ; they found a good deal of Admiralty and other Government work being done, but they also found a considerable number of machines lying idle which could be turned on to shell. They inspected fifty-four works of which twenty were considered too small to undertake independent work, and, as a result, made a definite offer to the War Office to undertake the manufacture of 200,000 18-pdr. H.E. shell, to be delivered at the rate of 20,000 a week within twelve weeks of the order being placed. The offer, which was accepted and embodied in the formal agreement with the Government which was signed on 12 June, 1915, was quickly followed up by

[1] A statistical summary of the committee's output is compiled in Appendix V.

[2] D.A.O./7b/657, 659, 803, 2045, 2335 ; D.A.O./Misc./1394 ; HIST. REC./R./1121·27/5.

others, and by the beginning of August it had been arranged that the committee should place contracts for 250,000 fuses, an unlimited quantity of 4·5-in. H.E. shell and 25,000 6-in.shell. Ministerial approval was also given on 7 August, 1915, to a Board of Management, which included the two managers, to carry out the scheme.[1]

The preliminary organisation of the district was thus carried out with great speed and smoothness, but East Anglia now shared the early difficulties common to all Boards, suffering from excess of specification, change of requirements, lack of gauges, inspection difficulties, and, often, scarcity of material. Local difficulties arose, too, common to manufacturers at an experimental stage, often employing plant not too suitable for the purpose. The consequence was that output was delayed considerably beyond expectation, but even so the East Anglian Munitions Committee claimed to be the first co-operative area to deliver 18-pdr. shell, of which regular output began in September, 1915. It was not until January and March, 1916, that the output of 4·5-in. shell and 6-in. shell respectively began to be made.

By the close of August, 1915, a depot had been built on the premises of Messrs. Ransomes & Rapier, Ipswich, where contractors' shell was assembled for final operations and for inspection. As time wore on, additions and extensions were made to cope with the painting, rectification, varnishing, cleaning, etc., and further provision had also to be made for the reception of shell. Some idea of the size and importance of the depot may be gathered from the fact that it employed between 300 and 400 persons, mostly women. It was run on the lines of a factory, with canteen, welfare and ambulance department, and day and night shelter.

Although the East Anglian Board subsequently placed contracts for many other stores—60-pdr. shell, 18-pdr. shrapnel, 18-pdr. smoke shell, 13-pdr. H.E., proof shot of different calibres, and many components of various kinds—with very considerable results,[2] the "group" work is essentially associated with the early contracts. The original 18-pdr. H.E. contract, when completed, was followed by others, spread among twelve contractors, and in the end more than two million shell passed through the depot. The assistance given by the Board in reducing the price of this type of shell throughout the country has been related elsewhere.[3]

Continuous contracts for 4·5-in. H.E. shell were placed with eight contractors, one of whom supplied the necessary sets of 4·5-in. machines, designing and producing single operation lathes, which made it possible to employ women and unskilled workers with success. The 6-in. shell was produced under considerable difficulties by five contractors, whose united weekly output never exceeded 1,030 shells.

Four contractors at Norwich, Lowestoft, Braintree and Ipswich, undertook the manufacture of fuses of various types, installing new

[1] For the personnel of the Board see Appendix IV.
[2] See Appendix V.
[3] See above, p. 42.

plant, putting up fresh buildings and training girls for the work under the general supervision of the Board. The number of fuses produced was 4,700,000.

In 1918 the Ministry decided to consider the possibility of making aeroplane engines on a co-operative basis, and the resources of various Boards were investigated. The only contract placed was with the East Anglian Board, but owing to the Armistice it was never completed.

The figures showing the output of the Board are set out elsewhere. The number of firms who eventually formed the group was forty-two ; the value of shell produced amounted to £6,000,000, and of fuses £1,596,290.

III. The South-East Midlands Board of Management.[1]

The South-East Midlands Munitions Committee was formed to organise the resources of five counties : Bedfordshire, Buckinghamshire, Hertfordshire, Cambridgeshire and Huntingdonshire. The district was mainly agricultural in character, and the leading peace time industries of chair-making, straw-hat making, brush-making, paper-making, and brewing, combined with the schools of Bedford and the colleges of Cambridge, appeared to offer singularly little prospect for the manufacture of munitions. There were a certain number of engineering firms of some size scattered over this wide area, and at Bedford itself several engineering works of great importance were concentrated, but they were already fully occupied with Government work.

This was briefly the position when in July, 1915, the Ministry proposed to bring these counties under the general scheme of local administration, and enlisted for this purpose the aid of Mr. W. H. Allen, head of the firm of Messrs. W. H. Allen & Company, Bedford, who carried through the main work of organisation. The method of forming a committee followed the formal procedure laid down at this time. The Sheriff of Bedfordshire, acting in conjunction with the Sheriffs of the other counties concerned, called a meeting at Bedford on 28 July, which was attended by representatives from the whole district. At this meeting, at which much patriotic enthusiasm was expressed, a general committee was first elected to include representatives from every county, which then proceeded to appoint an executive committee of ten members, to be known as the South-East Midlands Munitions Committee. The first act of this executive was in its turn to nominate a Board of Management,[2] which received ministerial approval on 4 August, 1915.

The agreement between the Board and the Ministry was signed on 7 September, and by it the Board undertook to produce in the Area a weekly production of 1,200 13-pdr. shell and 1,400 4·5-in. H.E., output to begin as soon as possible. Seventeen contractors were found almost immediately, with the result that orders were placed raising the above

[1] D.A.O./7/535, 137 ; D.A.O./Misc./1394 ; HIST. REC./R./1121/29 and D.A.O./7/123, 140, 203, 295, 558, 589.

[2] See Appendix IV.

estimate to nearly 6,000 13-pdr. and 2,660 4·5-in. With one or two exceptions these contractors were entirely inexperienced, but it is interesting to note that, in spite of beginning later than most Groups, the first consignment of 5,000 13-pdr. shell (of which 4,804 passed inspection) was placed in bond on 7 December, 1915. The 4·5-in. took longer, and there was also delay at the start owing to change of design, so that it was not until April, 1916, that deliveries began to be made.

After the beginning of 1916, as the original contractors became more experienced and fresh firms took up the work, a variety of other munitions were turned out by the Board. Other types of shell included 6-in. and 18-pdr. H.E., while firms who could not manage shell took up simpler munitions such as Stokes bombs, shell heads of different calibre, proof shot, case plates, friction tubes and other small components. In this way over $2\frac{1}{2}$ million articles were produced, of which nearly one-half were shell. The total figures for shell are set out elsewhere.[1]

The type of contractor drawn into munitions by the South-East Midlands Board furnishes an interesting commentary on the work. Here, as elsewhere, the available assistance was mainly from small engineering firms, motor car repair shops and garages,[2] but we also find such unusual contractors as the Bedford Grammar School undertaking a small contract for 50 13-pdr. shell a week, the Engineering Laboratory of Cambridge University manufacturing 18-pdr. H.E. shell and 60-pdr. shell heads,[3] while in 1917 the Bedfordshire Reformatory School took an order to make base-plates in their school.

IV. The Sussex Board of Management.[4]

Sussex is a county mainly agricultural in character. Its large towns are pleasure resorts rather than industrial centres, though a few engineering firms of some size, manufacturing motor cars or agricultural machinery, are to be found in Eastbourne, Horsham, Brighton and East Grinstead.

In the summer of 1915 the prospects of producing munitions in the county were not therefore very promising, but disadvantageous local conditions were compensated for by a steady local enthusiasm, and it was possible to organise, and also to carry out, a scheme which utilised to the full and eventually expanded its productive capacity.

Sussex was one of the districts organised after the foundation of the Ministry of Munitions along the lines definitely laid down by that Department. About the middle of July the Duke of Norfolk, the Lord Lieutenant, convened a meeting of persons interested in

[1] See Appendix V.

[2] Contracts were placed with 22 different towns and among 37 individual contractors.

[3] They also rendered great assistance by manufacturing sets of shell gauges at a time of great scarcity.

[4] D.A.O./7/221 ; 94/Bds./35 ; D.A.O./Misc./1394 ; Minutes of Meetings of the Sussex Board ; HIST. REC./R./1121/29.

engineering matters. At this meeting a small Munitions Committee was elected which included the Mayors of Brighton and Hove. In accordance with Ministry instructions, the committee proceeded to elect a Board of Management[1] composed of four members, representing respectively Brighton, Eastbourne, Hastings and Lewes, four of the principal towns of the county. This Board, whose headquarters were at Brighton, received ministerial approval on 6 August, 1915.

The Munitions Committee henceforward ceased to take any active part in organisation, meeting only at rare intervals.

It had been hoped that Sussex would be able to undertake some of the smaller types of shell, but investigations by the Superintending Engineer for the Area showed that such machines as were available were unfitted for even the lightest type. The Board's attention was therefore directed towards trench warfare work as needing simpler machinery and less skilled labour, and for this purpose the resources of the neighbouring county of Kent as well as of Sussex were exploited. An order for 2-in. trench howitzer bombs was almost immediately secured, followed by a contract for 3-in. Stokes bombs. It was on this latter munition that Sussex perhaps did its best work. The machinery of the small contractors was admirably adapted for its manufacture, and from the close of 1915 a running contract for varying quantities amounting to in all close on half a million was maintained. The wood-working resources of the county were also utilised to provide boxes for bombs.

From March, 1916, the Board also placed contracts for fuses, adapters and plugs in increasing quantities.

As was perhaps unavoidable, progress in these contracts was occasionally hindered by lack of experience on the part of contractors; thus in May, 1916, the high number of rejections for 2-in. trench bombs was causing the Board great anxiety. Again, in October, 1916, the department complained that the fuse contract was badly in arrears.[2]

In the autumn of 1916 the demand for Stokes bombs diminished and supplementary work had to be found for the Board's contractors. The possibilities of firms under them taking up aeroplane work were investigated by the Board, with the result that they lost some of their most successful contractors, who turned over to the manufacture of aeroplane engines and parts. The preliminary experience gained by these contractors in their work for the Board on the comparatively simple Stokes bomb helped to make it possible for them to pass on to more elaborate work and the Board's educational influence in this way must not be overlooked.

The miscellaneous character of the Board's contractors furnishes an interesting commentary on how it accomplished its work. As was to be expected, all the available engineering firms were pressed into its

[1] See Appendix IV.

[2] The delay here was partly due to lack of foresight in ordering gauges and was quickly remedied.

service, with good results, while firms whose experience was of a more general character such as timber merchants and saddlers were also found among its contractors.

In addition also valuable help was afforded by the enterprise both of corporate bodies in the county and the enterprise of private individuals. The most remarkable performance was that of the Motor Omnibus Department of the Eastbourne Corporation who initiated the manufacture of Stokes bombs in the county, attaining eventually an output of 2,000 a week. Part of their works were used as a Government Bond for the Sussex area. The Hastings and St. Leonards Gas Company also produced, partly by voluntary work, a considerable number of Stokes shells, while the Brighton Municipal Technical College and the Horsham Urban District Council assisted in the production of fuses. Mention must in addition be made of the Tunbridge Wells Munitions Association, composed of a number of firms who, under the administration of the Borough Electrical Engineer, carried out between 1915 and 1917 a contract under the Board for Stokes bombs with a separate Bond for storage and examination. A considerable output was achieved by individual effort. Stokes bombs were manufactured by Sir James Horlick in the garage at West Dene, Chichester. Other patriotic persons undertook to produce fuse parts in the workshops and even in the drawing-rooms of private houses.

The turnover of the Sussex Board during the first year of its operations exceeded £100,000. The total value of munitions supplied between 1915 and 1918 was £244,636. The administrative expenses were high in proportion to this turnover.[1]

---

[1] See above p. 35.

CHAPTER XIII.

LOCAL ADMINISTRATION IN SCOTLAND[1] (AREAS VIII. AND IX.)

I. Administration by the Director of Munitions for Scotland.

(*a*) The Appointment of Mr. Weir.

The work of the Glasgow Armaments Output Committee, which has been described elsewhere,[2] was already drawing to a close in June, 1915. Mr. Stevenson's letter of 21 June, to Mr. Lloyd George, outlining a scheme of Area Organisation to be applied throughout the United Kingdom, had suggested the suitability of a Glasgow office which should control the whole of Scotland and had considered the possibility of expanding the administrative machinery of the existing Glasgow Committee for the purpose. On 28 June he explained to the committee the proposed scheme of decentralisation and the increased scope possible for their work. They accomplished little more, however ; their composition was too unwieldy and the organisation of munitions production, now of paramount importance, had always been the least prominent side of their work. They continued to exist as a consultative committee until the appointment in September, 1915, of an advisory Board of Management for Glasgow, when they henceforward ceased to meet.

One of the last official acts of the committee was to invite Mr. (afterwards Sir William and later Lord) Weir to advise them as to the prospects of establishing a National Shell Factory in Glasgow. The capacity of the Clyde district was at this time fully employed, mainly on Admiralty work, and this, combined with the marked dearth of labour, decided Mr. Weir to report unfavourably on a scheme which would involve both delay and further dissipation of effort. He produced a counter scheme for co-operative work, evincing a remarkable grasp of the possibilities of the district, which brought him into touch with Mr. Stevenson, who was at the moment occupied on plans for the organisation of Scotland.

On 7 July, Mr. Weir had written to Sir Percy Girouard, placing his services freely at the disposal of the Ministry " bearing in mind that my experience has hitherto been of an executive nature."[3] On 13 July, he was offered the post of Supervising Engineer for the whole of the Scottish Areas,[4] and throughout the month he investigated the resources of the engineering firms of the district and built up the scheme

---

[1] Hist. Rec./H./1121·3/2 ; Hist. Rec./R./1121·3/1.
[2] Vol. I, Part III. Appendix XV. See also above, Chap. I.
[3] D.D.G.A. 964 ; D.A.O./Misc./515. [4] C.R. 041.

to be known later as the Glasgow Shell Scheme. During this time he remained in constant touch with the Ministry and particularly with Mr. West. Meanwhile Mr. Stevenson's department had been busy on the administrative side and had divided Scotland into two Areas, a Western and an Eastern, establishing Area Offices at Glasgow and Edinburgh respectively. In organising the Western Area, use had been made as far as possible of existing machinery; the premises which served as offices for the Glasgow Armaments Output Committee were used as an Area Office. Certain officials too, who had originally been lent to the Glasgow Committee by the Board of Trade, were now attached to the Area Organisation; thus Mr. Patterson, hitherto acting as Secretary of the Glasgow Committee, was appointed organising Secretary to the Area and continued to act in his dual capacity throughout July.

At the beginning of August, Mr. Weir was made Director of Munitions for Scotland. The powers conferred under the new appointment were not closely defined, but, except in the case of Messrs. Beardmore, with whom it was agreed he was not to interfere, left him a very free hand over the whole of Scotland. The greater part of his energies were at first absorbed in increasing the output of shell, and more particularly, in initiating and organising the Glasgow Shell Scheme. Later he was concerned in his official position with practically all war work undertaken in Scotland. In this manner he worked for almost every department of the Ministry—Raw Materials, Trench Warfare, Transport, etc. While acting in frequent consultation with the departments with which his work brought him into contact, the Director was essentially independent of their control and could not be considered their representative in the ordinary sense of the word. The Glasgow office was in fact a miniature Ministry of Munitions, called upon to perform services for all the different departments from time to time. His relationship with the Director of Area Organisation was different; here there was the same essential independence as regarded work, but the position of the department as co-ordinating the work of all the Areas was recognised and a definite liaison between the Scottish Area Offices and Area Organisation headquarters was maintained. In the same way such matters of general policy relating to Scotland as came within the purview of the D.A.O. Executive Committee, and later of the Shell and Components Committee, were brought before those committees for settlement. The Director of Munitions corresponded direct with the departments concerned in all matters relating to direct and assisted contracts (under which came the Glasgow Shell Scheme) and contracts made by the Aberdeen, Dundee and Edinburgh Boards of Management, copies of correspondence being in all cases sent to the Director of Area Organisation for his information.

(*b*) The Glasgow Board of Management.

Mr. Weir was prepared to administer Scotland along the lines of Area Organisation already established there. His own work was concentrated on Glasgow and the West of Scotland district, and one

of the earliest questions to arise was the appointment of a Board of Management. He decided that the usual executive Board was not desirable, partly because of the difficulty of securing a good executive from the industrial neighbourhood, whose leading engineers and manufacturers were already fully engaged in developing their own resources, and partly because the schemes under consideration were very large and once started could be better dealt with direct by the Ministry. Accordingly, after consultation with Mr. Stevenson, he initiated a policy of direct contract and the institution of a Board that should be advisory in character. On 7 September, he submitted a list of persons who had consented to act for the Minister's approval, which was granted on 16 September.[1]

The Glasgow Board of Management met fortnightly, and its meetings were attended by the Director of Munitions and by the Admiralty representative. At these meetings the Director reported regularly to the Board on the progress of all contracts and their opinion was consulted on all general questions, such as extension or reduction, which arose in connection with contracts. The Board also kept in touch with the work by means of regular visits to the factories. Their minutes often recorded a definite line of action suggested by them and subsequently taken. This occurred more especially in connection with such questions as dilution of labour and holidays, but a very strong expression of their opinion in August, 1916, as to the necessity of organising the raw materials industry in Scotland was partly instrumental in the setting up, as they had suggested, of an advisory board under the Director of Munitions to deal with the question.

The Board's work also included the initiation and carrying out of an important scheme for the training of unskilled workers at the Glasgow Technical College. By October, 1915, 1,200 persons had been enrolled for tuition and 40 lathes secured. This scheme, which from November, 1915, received financial support by arrangement with the Ministry of Munitions, the Scottish Education Office and the Treasury, was developed as time went on to include the training of acetylene welders and skilled female labour.

(c) Administration through the Glasgow Area Office.

As the headquarters of the Director of Munitions the constitution of the Glasgow Area Office differed from the English offices, for, apart from the enormous amount of work entailed in organising the Western district, certain supervisory functions were exercised over the Eastern Area. In December, 1915, Mr. (later Sir Fred) Lobnitz, a member of the Glasgow Board, was made a Deputy-Director and in January, 1917, on the appointment of Mr. Weir as Controller of Aeronautical Supplies, succeeded him as Director. In May, 1917, Mr. Simpson was made Deputy-Director, confining his work mainly to the Eastern Area.

---

[1] D.A.O./9/20. For the members of the Board see Appendix IV.

All details arising from labour questions in Scotland were handled throughout by the labour officials attached to the Area Office independently of the Director. In view of his position as an employer of labour Mr. Weir laid this down from the first as a definite policy. Any action he took was advisory and as a rule only in relation to Ministry headquarters; in particular the appointment of Dilution Commissioners for the Clyde Area early in 1916 was largely brought about by his report on the necessity for the energetic introduction of dilution of labour.

In August, 1915, an Admiralty representative was attached to the Glasgow office. His work was by no means honorary. The Clyde district was already largely engaged on Admiralty work, which, contrary to the Director's expectations, as time wore on continued to absorb further labour and definitely delayed the progress of his munitions schemes. Extreme care had to be exercised to avoid entrenching on the Admiralty preserves, and a stipulation was inserted in all contracts under the Glasgow Shell Scheme that, except with the express approval of the Ministry in writing, no plant was to be used for shell which had been used for Admiralty work at any time within the previous six months. As a result of co-operation between the representative and the Director no single complaint was ever received that the Ministry of Munitions activities were interfering with their work. In May, 1917, the Admiralty representative was withdrawn and the Admiralty Shipyard Labour Department set up headquarters at the Glasgow Area Office.

As the scope of munitions work broadened in Scotland representatives of other departments were attached to the Area Office and in March, 1918, an Area Engineering Board was set up.[1]

II. The Glasgow Shell Scheme.

(*a*) Inception of Scheme.

The Glasgow Shell Scheme, a most remarkable experiment based originally on co-operative output, must be considered among Mr. Weir's most notable achievements. Both in its initiation and later organisation he exemplified—and justified—the policy which he so strongly upheld, that it was wisest, where possible, to make use of and expand existing resources rather than create new facilities.[2]

The provisional scheme which Mr. Weir had brought forward under the auspices of the old Glasgow Armaments Output Committee was revised as the result of more detailed investigation of the resources of the district and also of frequent consultations with Mr. West, who indicated the programme of shell which he wished to allocate to the Glasgow district, apart from Messrs. Beardmore's quota. Mr. West also gave him the prices as arranged with the large armament firms.

On 23 August Mr. Weir submitted to the Director-General of Munitions Supply a programme outlining a co-operative output for the district of 28,500 shell a week, of which 6,000 were 6-in., 20,000 4·5-in.

---

[1] See Chap. IV. [2] D.D.G.A.5037; C.S.M. 28622.

and 2,500 60-pdr. He reported that arrangements could have been made for a larger type of shell had the Ministry so desired. The terms asked by all the firms under this scheme were similar to those arranged for National Projectile Factories, but interest and depreciation charges were based on a very much higher scale. Mr. Weir explained this by the fact that the units were smaller than those arranged with the large armament firms and also that inexperienced firms desired a percentage which would cover them against loss.

These terms were considered far too high by the Ministry, who even considered the possibility of arranging contracts on the ordinary lines —except that the Ministry might provide the machinery—with each firm independently.[1] This plan did not commend itself to Mr. Weir, who during the next few weeks carried on active negotiations with the firms for a revision of prices. On 5 September Mr. West and Mr. Fowler were in Glasgow to discuss the matter, and on 23 September Mr. Weir submitted a revised scheme to the Ministry which included offers for the larger types, 12-in. and 8-in. shell.

This revised scheme was provisionally accepted by the Ministry. The proposals under it fall into three classes :—

(1) *National Projectile Factories.*—Three were proposed for the machining of 60-pdr. shrapnel, the machining and forging of 12-in. H.E. and for machining 8-in. H.E.

(2) *Ordinary Contracts.*—Two contracts for forging 60-pdr. shrapnel and 4·5-in. H.E. were submitted.

(3) *Assisted Contracts.*—Nine such contracts were presented for consideration, and included the forging of 6-in. H.E. and 8-in. H.E. and the machining of 6-in. H.E., 8-in. H.E., 4·5-in. H.E. and 60-pdr. H.E.

These suggested sources of supply were arranged so as to co-operate in obtaining a total weekly production of shells, forged and machined, as follows :—10,000 60-pdr. shrapnel, 500 12-in. H.E., 6,000 8-in. H.E., 6,000 6-in. H.E., 5,000 4·5-in. and, when the scheme was fully complete, 4,000 60-pdr. H.E.

The accompanying table shows the allocation of shell to the various firms concerned, and clearly exemplifies the co-operative principle on which the scheme was based :—

Nature of Scheme.	Name of Firm.	Production per week.	Machining or Forging.	Shell.
National Projectile Factories.	Babcock & Wilcox, Ltd. (Aisne).	10,000	Machining.	60-pdr. Shrapnel.
	(Ypres).	500	Machining and Forging.	12-in. H.E.
	G. & J. Weir, Ltd. (Albert)	2,000	Machining.	8-in. H.E.
Ordinary Contract.	Babcock & Wilcox, Ltd. (Aisne).	10,000	Forging.	60-pdr. Shrapnel.

[1] D.D.G.A. 5037.

Nature of Scheme.	Name of Firm.	Production per week.	Machining or Forging.	Shell.
Assisted Contracts.	Stewarts & Lloyds, Ltd. (Liège).	6,000	Forging.	6-in. H.E.
	North British Locomotive Company, Ltd. (Marne).	6,000	,,	8-in. H.E.
	Singer Manufacturing Company, Ltd. (Anzac).	3,000	Machining.	6-in. H.E.
	G. & J. Weir, Ltd. (Flanders).	3,000	,,	6-in. H.E.
	North British Locomotive Company, Ltd. (Mons).	3,000	,,	8-in. H.E.
	North British Diesel Engine Works, Ltd. (Argonne).	1,000	,,	8-in. H.E.
	David Rowan & Company (La Bassée).	2,500	,,	4·5-in. H.E.
	Thermotank Company (Bethune).	2,500	,,	4·5-in. H.E.
	Halleys Motors, Ltd. (Lille).	4,000	,,	60-pdr. H.E.

It was not found practicable that one contract should feed another as had been intended, and the co-operative idea was shortly lost sight of. In this way the term Glasgow Shell Scheme is very soon found applied to the assisted contracts only, though actually they were merely a part of the scheme. It is true that they provided the major part of the Director's work, for the National Projectile Factories and Messrs. Babcock and Wilcox's ordinary contract for 60-pdr. shrapnel forgings, once the long and tedious negotiations connected with their starting were over, passed into direct relations with the Ministry and so out of the sphere of the Director, save in matters of general supervision such as was involved in questions of capital expenditure, change over of work, etc.

(*b*) Administration of the Assisted Contracts.

While differing in detail the new proposals for assisted contracts had certain features in common. The Ministry was in every case asked to furnish the necessary capital, whether for erecting new shops or for adapting new buildings. All building or adaptation covered by this capital expenditure was to remain the property of the firms concerned, on the grounds that the Ministry's lien would be continuously exhausted by the delivery of the contract number of shell. A fixed price was now asked per shell. Finally, as a considerable sum would be required to finance the actual manufacture of the shell, particularly during the development period, it was suggested that the Ministry should make the necessary advances for the purpose.

When the question arose of letters of authorisation to the firms signed by Mr. Hanson, he expressed an opinion that the scheme, as a whole, was an expensive one, the prices working out in most cases higher than the maximum prices fixed for Boards of Management, and

this in spite of the large advances asked for ; thus in one case a charge of 42s., plus 16s. 8d., representing the capital outlay asked on each shell for machining 6-in. shell, compared very unfavourably with the Ministry's maximum charges of £4 10s. up to 31 March, 1916, and £4 7s. 6d. after. Mr. Hanson was emphatically of opinion, too, that the plant should in every case remain the property of the Government.

At the close of September, as authorisation was still delayed, Mr. Weir asked for a speedy decision, as firms would shortly be requiring advances against their expenditure. Mr. West replied that the Ministry raised exception to the comparative costliness of the scheme in its present form. In particular, the proposals as to the ultimate ownership of buildings and plants (of which Mr. West had known beforehand) could not be accepted. Mr. Weir took some exception to these criticisms, pointing out that his original proposals of 23 August, which covered manufacture of shell at practically cost price, all plant remaining the property of the State, had been declined.[1] However, on 5 October, after some discussion between Mr. Hanson, Mr. Bertram, Mr. West and Mr. Weir, it was agreed that Mr. Weir should bring forward another proposal on the basis that the price should be raised 5 per cent., while the plant, etc., should remain the property of the Ministry at the conclusion of the contracts.[2]

In accordance with this agreement the Director of Munitions once more got in touch with the firms concerned, and by 12 October a further revision of the proposals was in the hands of the Ministry. Under these latest proposals each firm asked an increase, ranging from 5½ per cent. to 11 per cent. on their former price, meanwhile acknowledging the Government's claim of ultimate ownership of plant. With the exception of the North British Locomotive Company, no higher estimate was given for capital expenditure under the scheme. Once more the Ministry gave a provisional acceptance to the terms on 23 October, and the firms were authorised, pending the preparation of a formal contract, to proceed with their preparations for manufacture.

Certain provisos embodied in the acceptance of 23 October were to lead to yet further negotiations. They included (1) the refusal of the Ministry to give any guarantee against loss, as the price agreed on should provide the most inexperienced firm with a reasonable profit ; (2) the agreement by the Ministry to make advances for capital expenditure without interest on receipt of an accurate schedule of commitments and of adequate security ; (3) the agreement to an advance of working capital carrying 5 per cent. interest to be made on the production of security ; (4) the proposal that a general rise or fall in the price of wages should be marked by a corresponding rise or fall in the price of shell was agreed to, but the Ministry refused to

[1] On 26 October, 1915, Mr. West minuted to Mr. Hanson : " When I approved of the whole of the scheme I meant that I approved of the scheme of laying out of the factory. As you know, I do not deal with the contract prices. At the same time I must point out that there is some difficulty in getting firms to undertake this work." (94/Nat./59.)

[2] 94/Glasgow/5.

compensate for delays in the delivery of materials or for work on defective material; (5) the suggestion that all plant and equipment was to be removed at Government cost at the conclusion of the contract, six months being allowed (free of rent) for material.

Every firm raised objections to some or all of these provisos. Their protests were co-ordinated by Mr. Weir, so that the scheme as a whole presented a united front. A circular letter from the Ministry, dated 4 November, summarised the general position reached in negotiations at that date. It was drafted by Mr. Mann and Mr. Weir in consultation, and accepted by Mr. Hanson, in whose name it was issued. Certain concessions had been granted. Loss due to causes entirely beyond the control of the manufacturer (and more especially those occasioned by delay in supplying materials) was to be compensated for. When removal of plant and equipment was delayed beyond three months, a payment proportional to the annual valuation of the relative buildings would be made by the Ministry.

On the other hand, the Ministry proposed that, in consideration of their guarantee against loss, the shells should be charged at actual cost price, with the addition of the saving in cost below a flat standard rate. For this purpose an interim monthly settlement should be made, but the cost should be taken as a whole over the period of the contract. Expenditure in machining defective material was not to form part of the cost. The flat rates were to be those prices accepted on 23 October, and were: for forging—8-in. shell, 79s., and 6-in. 85s.; for machining,—8-in., 100s., 6-in., 44s. 6d., 60-pdrs., 35s., and 4·5-in., 32s. The Ministry would install all necessary tools, but their upkeep and the cost of all perishable tools would be included in the production costs. All plant purchased from Ministry advances was to be identified by number and marking as Government property, and was not to be pledged or sold without the consent of the Ministry.

The procedure for termination of the contracts was defined in this same letter. Total outlay plus 5 per cent. was to be paid in the event of the Ministry, before the productive period was reached, deciding not to proceed with the scheme. Otherwise the Ministry had power to terminate contracts (*a*) either at three months' notice without obligations, or (*b*) at any time without notice, in which case all outlays plus 5 per cent. of their total amount would be refunded. If the Government considered it desirable, a firm should continue to operate the plant to its full capacity during the continuance of the war.

By 12 November, replies had been received from all firms contributing to the Glasgow Shell Scheme, and after further consultation between the Finance and Contracts Departments of the Ministry and Mr. Weir certain amendments were agreed on. In the first place the Ministry agreed that contracts should be placed upon a cost basis plus half (instead of quarter) of the savings between the ascertained cost and the price agreed on. Amendments were also introduced into the Termination of Contract Clause, by which the operation of the clause dealing with termination after the producing stage had been reached was not to be so applied as to reduce the share of any profits due to the

contractors; in addition, the three months' notice, claimed by the Ministry as their right, was not to be given earlier than one month after production had commenced.

The principle of sharing profits with the Ministry, which it is interesting to note gave a new co-operative character to the Shell Scheme, was accepted by all the firms save the North British Diesel Engine Works, who alone had asked for no guarantee against loss. They, therefore, claimed that the terms originally agreed to, by which they were to receive 100s. per shell, should be adhered to, and were upheld by Mr. Weir, who alleged that by placing their 8-in. shell shop in their main erecting shop they were debarred from carrying on their ordinary business.

The ground was now fully prepared for the formal contract, which took some time to draft. On 24 December, 1915, Sir Alexander Lawrence submitted a skeleton contract for use with the various Glasgow shell contracts. A great deal of revision was necessary particularly in view of the differences between English and Scotch law, and constant communication was kept up between the Contracts and Finance Departments, the Treasury Solicitor's Department, and the Treasury Solicitor's agent in Scotland. On 16 February, 1916, the final amended form was submitted by Mr. Weir to the firms for their observations.

It shortly appeared that two demands were now common to all the firms, (1) for an increased capital advance[1] and (2) for a modification of delivery dates to a later period. Dealing with the first the Director of Munitions stated that the excess figures were, in his opinion, in every case reasonable and justifiable; estimates made in September, 1915, for enterprises entirely new to the firms could necessarily only be approximate. With regard also to the deferred dates, he pointed out that all estimates had been falsified by delays in deliveries of machine tools; in only three cases had more than 50 per cent. been delivered. On his representations the required concessions were made. Various minor amendments and modifications delayed the final drawing up of the contracts, none of which were signed before May, 1916. In the case of Messrs. David Rowan & Company's contract for machining 4·5-in. shell, the delay was prolonged till the middle of October owing in the main to the firm's determination to protect themselves at all costs against possible loss. They were eventually allowed to work the shell factory as a private limited company, the La Bassée Shell Company, with a nominal capital of £5,000, conditional to their writing a letter guaranteeing responsibility to the Ministry for the performance of the company's obligation under the contract.

(c) Later Development of the Scheme.

The Director of Munitions continued to exercise a certain intermediary control over the scheme after the signing of contracts had brought the firms into direct relations with the Ministry. In June, 1916, there was considerable criticism from the Ministry as to delayed

[1] See Appendix III.

production in the Glasgow district. Already, however, matters were improving. At this date the initial difficulties of manufacture had been overcome and output under all the contracts (except that with the North British Locomotive Company who had been unable to make a start owing to want of steel) had begun. Such difficulties as remained to be overcome were outside the contractors' control, notably the lack of millwrights and skilled tool fitters; and the quality as well as the lack of quantity of machine tools. With regard to the latter the Glasgow contractors had been obliged in many cases to take badly made American machines, often incapable of the required conversion; even where machines were built by Scottish engineering firms to the design of Messrs. Lang, deliveries were delayed and considerable rectification necessary. The shortage of steel too, was affecting output, and indeed the Ministry had requested that Messrs. Stewart and Lloyd, who had outstripped the other firms in the production of 6-in. forgings, might be instructed to cut down their output.

Work now went steadily forward and in October, 1916, when Mr. Weir reported to Sir Glynn West on the Scottish position in connection with the shell extension scheme under consideration, the Glasgow contracts had practically attained their promised output, and in one or two instances exceeded it. They were also reported to be capable of immediate expansion.[1]

About this date the question of continuation contracts for the scheme came up before the D.A.O. Executive Committee. Mr. Jenkins, who had been in consultation with Mr. Weir, advised that the existing principle of a flat rate below which half the profits were shared with the Ministry should be maintained, but that the flat rate might be reduced. This was accordingly decided, and a fresh basis of prices formed on the Department's costings supplemented by the actual costs of firms was made. In every case considerable reduction, amounting to about 30 per cent. on the old price, was effected. Running contracts on these lines were maintained during the war.

These contracts proved to be among the most economical of those negotiated by the Ministry. The reason for this may be sought in the fact that they were under the personal supervision of efficient firms, who by the terms of their contract had a direct inducement to economy.[2] A financial analysis of Messrs. Singer & Company's contract to machine 6-in. shell furnishes an example in point. The first accounting period ended on 2 December, 1916, when 65,866 shells had been delivered. These shells had cost the Ministry £3 14s. 0½d. each, thus apportioned :— Contract price, £1 19s. 9½d.; issue price of forging free, £1 11s. 6d.; allowance for use of Ministry building and plant, 2s. 9d. The comparative armament firm price at this date, including an adjustment of 2s. 10d. for forging, was £3 11s. 4d. This indicates that for the starting-up period the shell produced under this contract had cost the Minister 2s. 8½d. more per shell than the armament firms received. From

[1] C.S.M. 28622. [2] C.R. 4636.

1 January, 1917, the maximum price was reduced to 29s. 6d. accompanied by a reduction of 2s. 6d. in the issue price of copper bands. A change from Mark IV to Mark XII was made later and the price was adjusted to suit varying components, but the basis of the maximum price remained the same. For the ten months to 30 September, 1917, 195,623 shells were produced. The cost to the Ministry was £2 18s. 11½d. each. The comparative armament firm price, including an adjustment of 3s. 3d. for components, was £3 8s. 9d. In addition to the gain of 6s. 9½d. over the price paid to armament firms, the capital expenditure of £64,763 4s. 8d. authorised in the firm's contract of 22 May, 1916, was being amortised under the Ministry's regular rate for depreciation under assisted contracts of 10 per cent. on buildings and 33⅓ per cent. on machining and plants at the rate of £32,280 per annum.[1]

Throughout 1916 the control of capital expenditure remained in the Director's hands, the firms drawing lump sums from the Ministry on his certification. Large advances on their estimates had been made at the close of 1915 for which no account had been rendered as late as July, 1916, and investigation showed that in several cases, and notably that of Messrs. Stewart and Lloyd and the Singer Company, large sums were still undisbursed. The Finance Department therefore ruled that in future all advances not justified as immediate payments for plant must be treated as working capital and be charged with interest at 5 per cent.[2] On 23 April, 1917, the question of expenditure under the scheme was considered by the Shell and Components Manufacture Executive Committee, and it was decided that in future the Finance Department of the Ministry should be responsible, as in the case of other assisted contracts, for the examination of all expenditure.

Although at various times the firms were required to change over to a different mark, they continued, with the exception of the North British Locomotive Company, to work on the shell offered under their original contract. The North British Locomotive Company had refused to consider the suggested reduction in prices for machining and forging 8-in. shell. The Ministry in consequence listed these contracts for cancellation in the new programme of manufacture. The Mons machining factory was ordered to be closed down in March, 1917, and the plant was later used for 18-pdrs. The Marne forge shop ceased production in May, 1917, and the plant was eventually used for mines.[3]

III. The Organisation of the North and East of Scotland (Aberdeen, Dundee and Edinburgh Boards of Management).

(*a*) Organisation under the Armaments Output Committee.

A small number of sub-contracts for 60-pdr. shrapnel and 18-pdr. H.E. shell were already placed in the district when the work of organising the North and East of Scotland began under the War Office Armaments Output Committee. In the middle of April, 1915, the East

[1] Memorandum, dated 26 June, 1918, filed in 94/Glasgow/77, 85, 92. See also Appendix III.

[2] 94/Glasgow/15.

[3] See Appendix III.

of Scotland engineers and iron founders, in response to the appeal of the Engineering Employers' Federation, appointed a local committee at Edinburgh, while about the same date the Aberdeen Chamber of Commerce offered the Armaments Output Committee their assistance.

Both in Aberdeen and Edinburgh further action was delayed until after the formation of the Ministry. In the Dundee district, however, pioneer work was to be done. On 8 April the Dundee Chamber of Commerce forwarded a report to headquarters which on the whole did not indicate great possibilities; the labour shortage was serious, the larger firms were already working day and night on War Office and Admiralty orders and available machinery did not appear suitable for shell-making. Nevertheless, Sir Herbert Ogilvy, who was delegated by the Armaments Output Committee to inquire into the possible organisation of North-East Scotland, found that local feeling was strongly in favour of undertaking further munition work. From labour in particular he received very warm support: the Amalgamated Society of Engineers called a special meeting at which he was present, when it was unanimously agreed to work with any executive committee which might be appointed.

On 11 May a joint meeting of masters and men elected a local committee to go into the question of increasing the output of 18-pdr. H.E. shell, and it was arranged that Mr. West, who from the beginning was closely connected, as technical adviser, with the organisation of Dundee, should visit the engineering shops in order to advise on the best disposition of local resources. He reported to Mr. Booth that the number of machines available was somewhat disappointing, but he was confident that a weekly output of between 5,000 and 10,000 shells could be obtained. As a result of his recommendation to the committee they decided therefore to establish a National Shell Factory.

The success of the work later to be accomplished by the Dundee factory must be considered largely due to the early advantage of receiving Mr. West's technical advice in the selection of a site and in the lay-out of the factory.[1] He strongly opposed the committee's decision to take an empty foundry, the adaptation of which would be long and tedious and not specially successful. His counter-suggestion of the factory of Messrs. James F. Low & Company was opposed by the Dundee Committee, who pointed out to the Armaments Output Committee that the firm had twelve months' orders in hand for machinery for export, and that to turn over their shops would not only upset Dundee's principal trades, but would involve very large compensation to the firm. Mr. West thereupon gave his approval to an offer made by Messrs. Grimond of an empty building in their jute mills. On 1 June, 1915, the formal approval of the War Office was received for the scheme generally and the appointment of a Board of Management sanctioned.[2]

---

[1] Until October 1917 this factory was under the management of Mr. Newlands, who, in 1919, became Director of Area Organisation.

[2] Sir Herbert Ogilvy was disqualified as being at the time a member of the War Munitions Department, but joined the Board in July, 1915, in his individual capacity. The names of the other members are given in Appendix IV.

(*b*) The Constitution of Area VIII.

The creation of the new Ministry gave a fresh impetus to other districts. The Lord Provost of Edinburgh placed the resources of his city at the service of the new Department on 5 June, and subsequently held a large representative meeting at which was elected an executive committee, mainly of engineers. Offers of organised help came from local authorities at Falkirk, Clackmannan and Dunfermline, while Aberdeen Chamber of Commerce once more came forward, proposing to form a Munitions Committee of its own. Many offers, scattered over a wide area, were also received from individuals. Meanwhile, by the close of June, Mr. Stevenson had initiated the system of Area Organisation throughout the United Kingdom, and the North and East of Scotland were combined for administrative purposes into one Area—Area 8—with a head office at Edinburgh, to which all offers of help were henceforward referred.

The Edinburgh Office was under the general supervision of the Director of Munitions for Scotland, but had at the same time almost complete independence of action, with direct access to the Department of Area Organisation and various other departments of the Ministry. The principle was definitely established by Mr. Weir towards the close of 1915, when several months of loosely defined procedure had shown the impossibility of controlling the large district in any other way.

No Labour Officer was appointed to the Edinburgh Office, labour conditions in the Eastern Area being controlled from Glasgow. When a sub-area office was set up at Dundee in 1917 an Investigation Officer and his staff, controlled from Glasgow, were appointed. An outstanding feature to be noted in connection with the production of munitions in this Area was the absence of labour trouble, and at no time was production seriously interfered with by strikes.

The relations between the Edinburgh Area Office and the Boards of Management differed in the early days from those prevailing in England. A stricter control was kept over the Scottish Boards. Up to the middle of 1917 all correspondence for the Boards passed through the Edinburgh Office. The custom of the Area Secretary in respect of circulars was either to send them intact, to send extracts, or merely to ask for the necessary information as circumstances might dictate. All contracts were placed through the Boards after investigation by the Area Engineer and the approval of the Director; the correspondence in this case also passing through the Area Office. In certain cases of assisted contracts, as will be seen, the Boards took no part, the contracts being carried out directly between the Ministry and the firm after negotiation by Mr. Weir or the Area Engineer.

In the early days the Area Office officials were very tenacious as to the keeping of this procedure, which was their best hope of keeping in touch with the large and scattered areas, but by May, 1917, it was felt that the Scottish Boards could stand alone and their administration was brought into line with English Boards, all correspondence being addressed henceforward to their Secretaries.

(c) THE SCOTTISH BOARDS OF MANAGEMENT AND THEIR WORK.

Local organisation of munitions work was carried out in the North and East of Scotland by three Boards of Management, Dundee—set up and approved, as has been shown, before the foundation of the Ministry—Edinburgh and Aberdeen.

The Edinburgh district was the second to offer a definite scheme for organising its resources. A small executive committee, including the Lord Provost, worked throughout June in close touch with Mr. Stevenson's department. They found that a large number of engineering firms were well equipped with serviceable tools, but there was great dearth of labour, and co-operative work rather than a national factory seemed best suited to the district. Such capacity as there was appeared suitable for 4·5-in. shell and for fuses. The authorities of Heriot Watt College offered office accommodation and also the use of their workshops. In the middle of July, accordingly, a general scheme for co-operative work was submitted to the Ministry, together with the names of a proposed Board of Management. The scheme was accepted and the Board, of which the Lord Provost was ex-officio chairman, received ministerial approval on 20 July, 1915.[1] Professor Stanfield, of Heriot Watt College, was shortly after made Organising Engineer and Secretary, an appointment which dispelled a certain local dissatisfaction at the minority of engineers on the Board and was largely to ensure its future success. The area covered by the operations of the Edinburgh Board was a very wide one, and included within its limits certain early local committees who agreed to co-operate, notably Falkirk, Leith and Dunfermline. To conform to the general procedure a Munitions Committee was also appointed to which outlying towns were invited to send representatives; this committee almost immediately sank into abeyance, though the Board continued to be styled the Board of the Munitions Committee for South-East Scotland.

Owing to the comparatively small resources of Aberdeen the Ministry at first decided that it would be best to attach the district to the existing organisation at Dundee, which was only too anxious to extend its control over all Eastern Scotland North of the Firth. On further consideration such undue expansion was considered undesirable, and as Aberdeen was extremely anxious to become a self-contained area and the Lord Provost had already elected a local Munitions Committee, the Ministry authorised them to organise themselves, in consultation with the Area Secretary, as a separate unit. At Aberdeen, as at Edinburgh, conditions were more favourable for co-operative work, and their offer to machine 2,000 4·5-in shell weekly was accepted and embodied in a formal agreement with the Ministry on 13 August. Their Board of Management received formal approval on 17 August.[2]

The four years of work of the Scottish Boards produced results which may be considered remarkable.[3] The principal achievement of

[1] For the Members see Appendix IV.
[2] See Appendix IV.
[3] For figures of output see Appendix V.

the Dundee Board was a contribution to the output of 18-pdr. H.E. shell, for which they were, with the exception of Messrs. Beardmore, the main source of supply in Scotland between 1915 and 1917. For this output the National Shell Factory which began to produce in September, 1915, was chiefly responsible, though a small group of contractors also worked for the Board. The factory record both of output and cost of production was excellent ; the degree of efficiency attained is exemplified by the fact that between February, 1917, and February, 1918, 334,631 shell were reported to have passed firing proof without a single rejection or reproof.

The Aberdeen Board, who began by organising co-operative work on 4·5-in. were to do their best work on 6-in. shell, to which they were asked, as an urgent matter, to change over in the middle of 1916. This change was effected with great rapidity and the group was steadily producing before the close of the year. The weekly output of 1,600 shells was obtained from a small co-operative group of three contractors, of whom Messrs. McKinnon undertook the finishing of the entire output. At the beginning of 1917, as a result of certain malpractices on the part of the manager, the Ministry decided that the Board should take over Messrs. McKinnon's works and run them on the lines of a National Shell Factory. The plan proved a great success both financially and as regards output, which was ultimately largely increased.

At the beginning of 1918 the Scotch Boards of Management faced with efficiency the general reduction of the shell programme as it affected their groups. On 13 February Mr. Lobnitz summoned a joint meeting of the Boards at which the Director of Area Organisation was present, and the question of turning over to other work was discussed. The only Board unaffected was Aberdeen, whose output of 6-in. shell was urgently needed and was indeed increased later in the year.

The decision conveyed to close down 4·5-in. contracts fell heavily on the Edinburgh Group. The contract was distributed among three firms, two of whom were devoting their whole energies to it. The Board was very concerned to find suitable work to which these two firms might turn over and the Director of Munitions himself investigated their case. The matter was eventually settled by the change of policy which allowed 4·5-in. contractors to deliver at a reduced price, which was accepted by them. The Board had meanwhile arranged that the remaining contractors should take up the manufacture of 18-pdr. cast iron chemical shell.

The Dundee factory was affected by the reduction of 18-pdr. H.E. output, but a very rapid change over was made, and before the close of February the factory was forging 6-in. burster containers. The Board's 18-pdr. contractors were after some considerable negotiations turned over either to 6-in. burster containers or 18-pdr. chemical shell.

Work for the Air Board was also undertaken by the Edinburgh Board and parts of guns by Aberdeen.

Any account of the Board's activities would be incomplete without some mention of their work for the Trench Warfare Supply Department.

Owing to the simple nature of the work and the facilities available for the manufacture of iron castings, particularly in the Edinburgh area, a very large supply of bombs, grenades and other cast iron parts was readily obtained. Apart from negotiating ordinary contracts for trench warfare supplies, all three Boards maintained running contracts for 3-in. Stokes bombs on a co-operative system by which they purchased the raw materials and distributed them to the contractors to work up, the results being sent to a central assembling station. The Edinburgh Board also undertook in 1916 to place contracts for Sutton fuses which necessitated the supervision of a very large number of sub-contractors by the Board's officials.

IV. General Review of Other Administrative Work.

The inauguration of the Glasgow Shell Scheme and the development of the East Coast resources represented only a part of the work accomplished by the Director. In addition he not only assisted all the various developments of war work in Scotland but was also instrumental in initiating various schemes for the general improvement of munitions output.

As regards shell, the greater part of the remaining output was obtained either from armament firms, with whose work the Director did not interfere, or from direct contractors over whom he exercised a general control. Components were supplied by Scotland on a large scale, and in particular Mr. Lobnitz carried through the setting up of a 106 Fuse Factory—"Combles"—which was run by Messrs. Singer. The Glasgow Area Office also gave special attention to trench warfare work, and the "Edith Cavell" Projectile Factory, formerly a skating rink, on ground belonging to the Glasgow Corporation, was started in 1916 for the manufacture of trench howitzer bombs.

One of Mr. Weir's earliest actions was, at the request of the Ministry, to arrange for the constitution, erection and operation of a large filling factory. Land was taken at Georgetown, Paisley, and on 24 August, 1915, Mr. Weir submitted for ministerial approval a Board of Management by whom it was controlled with conspicuous success.

Turning to other sides of administrative work, it was due to Mr. Weir that a Transport Department was set up for Scotland. Already in October, 1915, the traffic delays in docks and on the railways had assumed grave proportions and Mr. Weir had appointed a transport supervision officer within the Area Office to deal with local conditions. In December he reported to the Director-General of Munitions Supply, to the Board of Trade and to the War Office on the serious congestion of transport, bringing forward the evidence of some eighty firms and forty eight collieries, all large consumers and all directly or indirectly engaged on Government work. In consequence the Director-General of Munitions Supply appointed on 27 December a Munitions Transport Officer for the whole of Scotland, to be attached to the Glasgow Area Office and to receive general instructions from Deputy Director-General (C). It soon became apparent that any question of mixed control of

transport matters would seriously affect the efficiency of the work, and in May, 1916, therefore, the control of Scottish transport was taken over entirely by the Munitions Inland Transport Department of the Ministry. Their work was thus removed from the jurisdiction of the Director, but their offices continued under the same roof as the Area Office, and the Director continued to give general advice and assistance.

Pioneer work was also done in organising the production of raw materials in Scotland. In July, 1916, when the shortage of steel was being keenly felt by his contractors, Mr. Weir consulted with the iron-masters as to the best means of increasing the output of pig iron. He met with a general lack of enthusiasm, based on growing misunderstandings with the Raw Materials Department on various important questions. He put the matter before the Minister, and in consequence a Scottish Advisory Committee on Steel Production was set up on 14 September, 1916, of which he was appointed chairman. Its functions were to advise and make recommendations to the Ministry of Munitions and its officials on all questions connected with the increased output of pig iron and steel in Scotland.[1] Mr. Lobnitz continued Mr. Weir's work on the committee, and also acted as chairman to a committee set up to control iron ore purchase in Scotland.

The Director of Munitions also co-operated in the work of the Scrap Department which was set up in Glasgow in September, 1917; the work of this department was particularly successful, and during 1917 and 1918 approximately 779,000 tons of scrap produced in Scotland were passed into the furnaces from the scrap merchants' yards.

The latest development of the Director's activities was in connection with tanks. In the beginning of 1917 a small branch of the Mechanical Warfare Department was established at Glasgow. Investigations proved that complete tanks could be built in Glasgow and that practically all supplies for these machines could be procured in Scotland. Contracts for the Mark IV type of machine were placed with three main contractors and the work of the branch rapidly expanded. In June, 1918, Mr. Lobnitz was appointed Controller of the Mechanical Warfare Department for Scotland and a Tank Production Committee was formed of which he was made chairman. In less than a month a new armour plate industry was established under its auspices; and at the time of the Armistice everything was in trim to ensure a production of 500 tanks a month and actual production and delivery had begun.

---

[1] D.A.O./9/168.

CHAPTER XIV.

IRELAND (AREAS X AND XI).

I. The Organisation of Ireland by Directors of Munitions.

For reasons arising from local and political conditions, the usual method of administration through Boards of Management did not obtain in Ireland, and the manufacture of munitions was dealt with by two Directors, answerable to the Director of Area Organisation, but with extended powers of action.

Already in April, 1915, under the Armaments Output Committee, Ireland had begun to organise, more particularly in the North, where Belfast forms the natural centre of her engineering industries, and where there were reported to be some hundreds of skilled unemployed workmen.[1] Organisation was undertaken in the first instance by the Belfast Chamber of Commerce, representing employers, and by the Federation of Engineering and Shipbuilding Trades, representing labour. On 12 April, the Chamber of Commerce decided to form a Munitions Committee, and the President saw Mr. Booth on 20 April, and received general instructions as to procedure. On 29 April, the Federation appointed representatives from their body to act as an Armaments Committee for Belfast and the district. The Chamber of Commerce also nominated a committee, and during the next few weeks sent several deputations to the War Office, but it was not until 14 June, 1915, on the occasion of a large and representative meeting under the presidency of the Lord Mayor, that their committee was formally elected.[2] Meanwhile local committees representing the South of Ireland were being organised on similar lines in Cork, Dublin and Limerick.[3]

This was the stage of development reached in June, 1915, and the inevitable delays and hindrances during the first six weeks of the new Ministry appear to have inspired even more than the usual degree of irritation among the Irish local committees, who were inclined to infer that they were treated with peculiar hardship. On 28 June, the Belfast Committee appointed a Board of Management to carry out a co-operative scheme similar to Leicester, different employers sent in lists of their machinery and Belfast Corporation sanctioned the use of machinery in various Corporation buildings. On 22 June, a deputation from Dublin was seen by Mr. Stevenson and as a result sent in a definite proposal to manufacture 18-pdr. shell. On 28 July, representatives

---

[1] D.A.O./Ireland/502.

[2] D.A.O./Ireland/502 ; D.A.O./Unregistered Papers/Belfast/52 (filed in the Archives Registry). These two bodies, representing employers and labour, held joint meetings in June, 1915, to decide on procedure. Both early ceased to have any executive function.

[3] D.A.O./Ireland/505.

from Limerick were interviewed. By this date the Dublin Committee were complaining that lathes promised to them were not yet available, and accusations were beginning to appear in the public press that Ireland was not being given the chance of making shell.[1]

The Ministry felt that the time had come when some definite decision as to the administration of Ireland must be made. While it could not be expected that any material quantity of munitions would be produced, owing to the comparative absence of industrial enterprise, combined with the difficult question of transport, yet it was felt that, if only from the political side, the existing resources must be thoroughly exhausted.

On 22 July, Captain Kelly, representative of the Ministry of Munitions, was sent over to Ireland to investigate the question generally. In the course of his inquiries he consulted, among others, John Redmond, Lord Pirrie, the Under Secretary of State, the editors of various Irish papers, and the representatives of many leading industries in all parts of Ireland. He also interviewed all the local committees. On the political side he obtained a general acquiescence that to Belfast naturally belonged the leadership in the production of munitions. The Belfast Committee in its turn promised to co-operate with the remainder of Ireland by supplying machine tools and gauges, by supervising work done in the South, and by training foremen.

It was decided as a result of Captain Kelly's report to organise Ireland as one munition-producing area with a representative of the Ministry permanently in residence there. Two offices were to be established at Belfast and at Dublin respectively. Captain Kelly was accordingly appointed, making Dublin his headquarters, while the North of Ireland was organised from Belfast by Mr. (later Sir Alexander) McDowell. In view of the importance of the Belfast Area, however, it quickly became evident that Mr. McDowell's position would have to be more clearly defined, and on 30 October the Ministry appointed Captain Kelly and Mr. McDowell to be joint directors. By the terms of their appointment they were responsible to the Director of Area Organisation and were in charge of the whole local organisation, including the Area Engineers ; all orders for munitions placed in Ireland were henceforward to be made through them.[2]

II. Work of Area XI (Belfast).

The principal industries in the Belfast Area are linen and shipbuilding, and throughout the war the great bulk of machinery and plant in the district was fully engaged on war contracts in connection with these trades. The prospects for shell-making were, therefore, limited and it was not found possible to found any national factories.[3]

---

[1] D.A.O./Ireland/505 ; D.A.O./Unregistered Papers/Ireland.
[2] D.A.O./Ireland/123 ; D.A.O./Unregistered Papers/Belfast/49.
[3] The possibilities of establishing a National Factory were contemplated as late as November, 1916, but had to be dropped. (D.A.O./Unregistered Papers/Belfast/34).

At the time of the establishment of the Area Office, considerable progress had been made by an Assisted Co-operative Group. The Board of Management had received ministerial approval in August, 1915, and co-operative work was in progress on an order for 250,000 Mills hand grenades, while manufacture had been started by private firms on preliminary orders for 4·5-in. and 6-in. shell. With the administrative changes entailed by the appointment of their Chairman, Mr. McDowell, as Director of Munitions for the North of Ireland, and the centralisation of work in the Area Office, the Belfast Board became a purely consultative body, with the exception of the above-named contract for Mills grenades, which the Co-operative Group carried to a successful conclusion.[1]

Henceforward complete control over the Area was exercised by Mr. McDowell, subordinate to him being the Area Engineer and other officials of the Area Office.[2] All new contracts were placed direct with the Ministry.

As above mentioned, it was not found possible to place contracts on a very large scale, but orders placed for H.E. shell (ranging from 9·2-in. to 13-pdrs.) produced upwards of half a million shell.[3] In addition, about half that quantity of shrapnel, over 3,000,000 shell components, and some 66,000 ammunition boxes were manufactured, in many cases from existing machinery adapted to the purpose. The total value of these contracts was £939,900.

A considerable part of the Belfast Area Office's work was done for Departments other than the Ministry. Tenders were invited and firms inspected and reported on for the Director of Army Contracts (for such diverse goods as sheets, towels, hosiery, blankets, soap), the Army Clothing Department and the Admiralty (for stockings, linen ducks and victualling shops). A permanent room was also maintained for the exhibition of War Office samples.

III. Dublin and the South of Ireland.

The district controlled from the Dublin Area Office lay south of a straight line drawn from Ballyshannon to Dundalk, excluding both these towns and also Enniskillen and Clones. Under the early constitution the Director, the Superintending Engineer and the Area Secretary formed a Board to administer the Area, the Director retaining a casting vote. These three officials also constituted the Board of Directors of each of the national factories which were subsequently established, and which were run by managers directly responsible to the Board.[4] After the resignation of Captain Kelly,

[1] D.A.O./Unregistered Papers/Belfast/52.
[2] D.A.O./Unregistered Papers/Belfast/34. The Superintendent Engineer and the Trench Warfare Engineer were the only officials at the Belfast Office until late in 1917, when the Aeronautical Supply and Inspection Departments attached their representatives.
[3] See Appendix V.
[4] D.A.O./Misc./1394.

which took place in September, 1917, the constitution was modified and the Engineer and Secretary became Directors acting under the Director of Area Organisation with equal authority, while enlarged powers were granted to the factory managers.

The system of local Boards of Management as obtaining in England was thus dispensed with, and the executive Board elected by the Dublin Munitions Committee in July, 1915, was accordingly dissolved.[1] Local committees, however, continued to exist at Cork, Galway, Limerick, and Waterford, and did pioneer work in establishing factories and exploiting the possibilities of private firms.

In August, 1915, this large and scattered Area was so far organised for the production of munitions that 18-pdr. plants had been allotted for National Shell Factories at Dublin and Cork, while private contracts for small components and ammunition boxes had been placed in the same towns. The Board of Administration during the remainder of 1915 concentrated on starting the Dublin factory, and at the same time explored the possibilities of extending the manufacture of munitions by private firms in the Area.

From the beginning of 1916 a feeling of discontent as to the share of munitions work which Ireland was receiving once more began to manifest itself. In February the Lord Mayor of Dublin presided over a private meeting of leading business men from all parts of Ireland, including the Lord Mayors of Belfast and Cork, the Mayors of Derry and Sligo and the President of the Dublin Chamber of Commerce. They there formed themselves into an informal committee and, through the agency of Mr. Redmond, secured an interview with Mr. Lloyd George on 10 March. Their general grievances were that Ireland was not, in proportion to her taxation, receiving a fair share of munition work, and that the country was meanwhile being drained of thousands of workmen, many skilled, who were being sent to English factories.[2] Particular demands were also made for the establishment of a national fuse factory at Dublin, for the extension of the shell factory already at work there, for national factories to be set up at Cork and Waterford, and finally for a filling factory for the whole of Ireland.

Following on this interview the deputation, at Mr. Lloyd George's request, formed itself into a standing committee, known as the All-Ireland Munitions Committee, which continued during the war to interest itself in the production of munitions and other Government supplies, acting by means of sub-committees, representing Dublin, Belfast, Cork, Waterford, Wexford and Sligo.[3] The Lord Mayor of Dublin acted as President.

---

[1] D.A.O./Ireland/68, 111.

[2] It was computed that some 6,000 to 7,000 workers had left Ireland within the previous four months.

[3] D.A.O./Ireland/238, 295; 94/Ireland/104; D.A.O./Unregistered Papers. Belfast early withdrew from active participation as the district declared itself amply supplied with Government work.

The Ministry decided that, apart from the difficulty of sending explosives and small components overseas, the comparatively small output would not warrant the establishment of a separate filling factory for Ireland. Other demands received favourable consideration. Arrangements for a 9·2-in. shell factory on the same premises as the Dublin National Shell Factory had already been under consideration and were now approved by the Ministry. It was also agreed to erect a fuse factory within the same grounds. At Cork, too, where the Munitions Committee had a genuine grievance, for a complete group of machines allocated to them in August, 1915, to start a National Shell Factory for 18-pdr. had subsequently been diverted to Dublin, a National Shell Factory for 4.5-in. shell was now approved and adequate plant assigned.

The proposal for factories at Galway and Waterford were not approved at this date, but later were successfully renewed, and by the close of the year factories for 18-pdr. shell at Galway and for cartridge cases at Waterford had been begun.

Meanwhile Ireland had been convulsed by the civil rebellion of Easter, 1916. The Dublin factory, where work had now begun, was in some danger. On 27 April the Secretary wrote that a number of workers had been shut up since 24 April, the day of the outbreak. They were fairly well provisioned and had continued work during that time. Firing and fighting were going on all around and there had been a certain amount of cross-firing over the factory premises. Fortunately both the shell factory and the Ministry offices escaped the general demolition of property at Dublin. One result of the rebellion was a widespread dislocation of industry, including the manufacture of munitions; the distress, owing to the recent destruction of property, was indeed urged by the All-Ireland Munitions Committee as a reason for further preferential treatment in August, 1916.[1]

Production in a limited way began at the Dublin National Shell Factory in March, 1916, but it was not until a year or more later that the other factories began to make deliveries, which in the case of Waterford were delayed till August, 1917. The particulars of the full number of shells accepted from these sources are set out elsewhere.[2]

In addition to munitions produced at the national factories, a certain amount of contracts were undertaken by private firms for the manufacture of various sizes of shell, components and ammunition boxes. In all 321 contracts were placed through the Dublin office, with 63 contractors, involving a turnover of about £1,500,000.[3] No financial assistance was received from the Government by these firms, but, where necessary, engineering advice was given by Area Officials.

It is almost impossible to find a standard of comparison by which to estimate the value of the munition work done in the South of Ireland. Measured in terms of output the results are not remarkable. The

[1] D.A.O./Ireland/295. [2] See Appendix V. [3] D.A.O./Misc./1394.

expenses, too, of the national factories, and particularly of the Waterford Cartridge Case Factory, were very high, though by 1918 they were rapidly diminishing.[1] It must be remembered, however, that the district was almost entirely non-industrial, that difficulties of transport served not only to aggravate delays in delivery of machinery and materials but also to increase expense, and that although unskilled and female labour was plentiful, skilled labour was very scarce.

The keynote of the Ministry's attitude in fostering all possible local resources and patriotism is to be found in Mr. Lloyd George's speech to the All-Ireland Munitions Committee on 10 March 1916.

> "It is desirable from the Imperial point of view that Ireland should have a visible demonstration of the fact that she is taking her share in this struggle. It is in itself a good thing to feel that her contribution is not merely in taxation, or even in her sons, but that she is taking her share also in all the work of carrying on this war to a triumphant issue."[2]

---

[1] The average cost for cartridge cases at Waterford for the six months ended 30 September, 1918, was 11s. 3d. as opposed to 16s. 7d. for the same time in the preceding year.

[2] D.A.O./Unregistered Papers/5.

APPENDICES

APPENDIX I.

(CHAPTERS II, IV, V.)

Table illustrating the Divisions under Area Organisation.

Area.	Area Office.	Sub-Area Offices.	Boards of Management within the Area.	Departments represented in the Area Office.
1	Newcastle ..	Hull, Sunderland, Stockton-on-Tees, West Hartlepool, Middlesbrough.	Grimsby, Hull, Teesside, Tyne & Wear.	Labour, Trench Warfare, Central Clearing House, Munitions Works Board, Raw Materials, Director of Forwarding, Aeronautical Supplies, Explosive Supplies, Munitions Transport.
2	Manchester ..	Liverpool, Barrow, Carnforth, Whitehaven, Newton Heath.	Blackburn, Bury, East Cumberland, Liverpool, Manchester, North Wales, Rawtenstall and Bacup, Rochdale, West Cumberland.	Labour, Trench Warfare, Central Clearing House, Munitions Works Board, Raw Materials, Aeronautical Supplies, Aeronautical Engines, Supervisor of Gun Progress, Explosives Supply, Munitions Transport, Mechanical Warfare, Machine Tool, Admiralty Shipyard Labour.
3	Leeds ..	Sheffield, Bradford ..	Leeds, Barnsley, Bradford, Halifax, Huddersfield, Keighley, Rotherham, Sheffield, Wakefield.	Labour, Trench Warfare, Central Clearing House, Raw Materials, Aeronautical Supplies, Explosives, Gun Repair, Air Board, Stores & Bonds, Munitions Transport, Admiralty Overseas and Admiralty Shipyard Labour.
4	Birmingham .	Lincoln, Nottingham, Coventry, Derby, Scunthorpe, Melton Mowbray, Adderley Park, Darlaston,* Langley Green,* Leamington,* Loughborough,* Northfield,* Oldbury,* Peterboro',* Sparkbrook,* Witton,* Wolverhampton,* Worcester.*	Leicester, Birmingham, Coventry, Derby, Lincolnshire, Nottingham, Oxfordshire.	Labour, Trench Warfare, Central Clearing House, Raw Materials, Machine Tools, Mechanical Transport Inspection, Finance, War Savings, Aeronautical Supplies, Munitions Transport, Ordnance, Explosives, Admiralty Shipyard Labour, A.S.C.
5	Cardiff ..	Swansea, Newport* ..	Cardiff, Ebbw Vale, Llanelly, Newport, Swansea, Uskside.	Labour, Trench Warfare, Central Clearing House, Munitions Works Board, Munitions Transport, Explosives, Port Forwarding, Aeronautical Supplies.
6	Bristol ..	Southampton ..	West of England, Cornwall.	Labour, Trench Warfare, Aeronautical Supplies, Munitions Transport.
7	London ..	——	Metropolitan Munitions Committee, East Anglian, South East Midland, Sussex.	——
8	Edinburgh ..	——	Aberdeen, Dundee, Edinburgh	Trench Warfare, Central Clearing House, Machine Tools.
9	Glasgow ..	Renfrew	Glasgow	Labour, Trench Warfare, Central Clearing House, Raw Materials, Ordnance, Aeronautical Supplies Munitions Transport, French Ministry of War.
10	Dublin ..	——	——	Trench Warfare, Labour.
11	Belfast ..	——	——	Trench Warfare, Aeronautical Supplies, Aeronautical Inspection, Admiralty Shipyard Labour.

* For the Aeronautical Inspection Department only.

APPENDIX II.

(CHAPTER V.)

Types of Agreement with Boards of Management.

(*a*) ORIGINAL AGREEMENT WITH THE BOARD OF A CO-OPERATIVE GROUP.

The Board of Management of the Munitions Committee is prepared to undertake an order to manufacture shells, complete with copper bands.

The Committee is prepared to commence delivery after the receipt of the order, of full instructions and of certified drawings of the shells and drawings of the gauges at the rate of per week, delivery to be increased at the rate of not less than each week, so that regular deliveries of at least per week shall commence not later than 12 weeks after the receipt of the order. The War Office to have the option to cancel any portion not delivered by 1916.

Shells shall be made from to War Office Specifications.

The Committee is prepared to make these shells at for the first , dropping to per shell for the balance, subject to reconsideration after completion of the first , if found necessary. This price to cover cost of material, and if the Government prefer to supply material, the Management Board will accept 5s. less for each shell supplied.

The Committee will make its own working gauges and check gauges, and also one set of master or reference gauges which will be submitted to and passed by Woolwich before manufacture is commenced.

The management of the local scheme to be under the control and direction of the Management Board.

The Management Board will be assisted by the Munitions Committee in the general promotion of the scheme, and in matters relating to machinery and labour.

The area shall comprise the district covered by the Engineering Employers' Association.

The Management Board will distribute orders to the various engineering firms in the district capable of dealing with sufficient quantities, and will be responsible to the Government for the shells manufactured.

The Management Board will rent a building to be used as a central store, where the shell shall be assembled from the various works for inspection by the Government inspector. The expenses in connection with this store shall be paid by the various firms manufacturing shells pro rata to the quantity delivered. The Government shall pay all expenses in connection with inspection.

The rates of pay for labour will be determined by the Munitions Committee, and will be applied uniformly in all the workshops manufacturing shells.

The Management Board rely upon the assistance of the Government to enable them to work under the same conditions as may be agreed upon for national factories in relation to trades union regulations, and as to recruiting labour and machinery from civil employment in their area.

Payment to be made by the Government monthly, covering the quantity of shells delivered the previous month.

The undersigned, being the members of the Board of Management, are prepared to act as Trustees and to be responsible for the due performance of the contract.

The Management Board have appointed as their Bankers.

(*b*) Original Agreement with the Board of a National Shell Factory.

Board of Management :—

Temporary Address :—

New Works :—

---

1. The above Board are authorised to rent which they have reported to be suitable for the purpose, at a price to be approved by the Government.

They would commence with an output of H.E. shells per week, working up to a larger figure as quickly as possible if required by the Government.

2. The Management of the National Shell Factory to be under the control and direction of the Management Board, after approval of the same by the Government.

3. The Management Board shall, subject to the general control of the Government, equip the Factory with machinery. Any proposed purchase of new machinery shall be referred to the Government.

4. Action which may involve questions of compensation other than reasonable hire or purchase price of machinery and plant shall not be taken without the previous sanction of the Government.

5. Adjustment of hire or purchase price shall be held to bar any claims by owners of plant and machinery for compensation or consequential loss of profits arising out of such hire or purchase.

6. The Management Board to be empowered at the cost of the Government to engage labour and work the plant.

7. The Management Board shall in case of dispute with the owners report to the Government what machinery and plant is required and the names of the owners, and the Government shall arrange, if so determined, for the transfer of such machinery or plant to the Management Board.

8. The area to comprise the district covered by the Engineering Employers' Federation.

9. The Government to be the owners or lessors of all machinery in use in the factory.

10. The Government to place all necessary funds at the disposal of the Management Board.

11. The Management Board to have power to engage suitable engineering and administrative and secretarial staffs and provide the necessary office accommodation. No salary in excess of £500 per annum to be authorised without prior approval of the Government.

12. No new buildings or extensions of buildings shall be erected without the previous sanction of the Government, which will arrange as to the payment and the ultimate disposal thereof and the machinery and plant therein.

13. No remuneration or profit whatever to be paid to any member of the Management Board in his individual capacity, but out-of-pocket expenses to be borne by the Government.

FINANCE.

14. The Government to advance the Management Board £ at once. The method of working will be that raw materials will be delivered to the Factory by the Government, all wages and other expenses being borne by the Board and paid for out of the money advanced to them. All shells which are proved to be correct and accepted after examination will be packed and delivered by the Factory to wherever the War Office may instruct them to be sent.

Further advances will be made by the War Office as required. When the Factory is no longer required, any surplus will be handed intact to the Government, after payment of any outstanding charges.

The system of accounting will follow the general lines laid down in the accompanying memorandum (National Shell Factories—Accounts).

15. The Management Board suggest the name of Chartered Accountants, of to be the auditors of the Factory, to be appointed by and responsible to the Government. The Board will appoint their own Bankers.

16. The Management Board offer their voluntary services to the Government. They rely upon receiving advice and technical supervision from the Government, and will be guided by such supervision.

APPENDIX III.

(CHAPTER XIII.)

III. The Glasgow Shell Scheme.

(*a*) CAPITAL EXPENDITURE ON CONTRACTS.

Firm.	Contract Capital.	Amended Estimates	Amount Claimed.
	£	£	£
Stewart & Lloyds	20,000	—	14,223 (final)
North British Locomotive Company (forging)..	65,000	90,000	84,656
Singer Manufacturing Company	107,919	133,156	104,336
G. & J. Weir	85,000	124,125	124,011 (final)
North British Locomotive Company (machining)	210,000	258,850	241,919
North British Diesel Company	82,500	84,512	62,284
Thermotank Shell Company	46,500	52,000	46,178
Halleys Motors Ltd.	104,650	113,150	102,089
David Rowan & Company	47,500	53,000	48,973

(*b*) OUTPUT OF SHELL FROM THE ASSISTED CONTRACTS, 1916–1918.

Factory.	Type of Shell.	Output.
Stewart & Lloyds (Liège)	Forging 6 in.	670,000
North British Locomotive Company (Marne)	,, 8 in.	294,545
Singer Manufacturing Company (Anzac) ..	Machining 6 in.	617,024
G. & J. Weir (Flanders)	,, 6 in.	480,425
North British Locomotive Company (Mons)	,, 6 in.	330,940
North British Locomotive Company (Mons)	,, 8 in.	146,800
North British Diesel Company (Argonne) ..	,, 8 in.	91,305
David Rowan & Company (La Bassée) ..	,, 4·5 in.	317,286
Thermotank Shell Company (Bethune) ..	,, 4·5 in.	278,100
Halleys Motors Ltd. (Lille)	,, 60-pdrs.	450,000

(*c*) Approximate Cost of Manufacture and Saving effected by the Ministry under the Co-operative Arrangement.[1]

Firm.	Shell:	No. of Shell supplied.	Total cost including share of Profit.	Total payable on Flat Rate Basis.	Total saving on Co-operative Basis.	Total cost per Shell including Depreciation.	Costing Period.
			£	£	£	s. d.	
Stewart & Lloyds	Forging 6-in., H.E., Mk. IV.	144,290	223,720	253,610	29,890	31 2½	11½ months to 30 Dec., 1916.
North British Locomotive Company	Forging 8-in., Mk. V.	105,442	322,696	416,496	93,800	62 2½	6 months to 2 Jan., 1917.
Singer Manufacturing Company ..	6-in. H.E., Mk. IV. and VI.	75,000	128,213	166,875	38,662	36 11	9 months to 2 Dec., 1916.
G. & J. Weir, Ltd.	6-in. H.E., Mk. IV. and VI.	81,009	159,486	180,245	20,759	43 1½	9 months to 31 Dec., 1916.
North British Locomotive Company	8-in. Mk. V.	46,102	183,736	230,510	46,774	58 11½	8 months to 2 Jan., 1917.
David Rowan & Company ..	4·5-in. H.E., Mk. VII.	41,198	61,797	65,916	4,119	32 3	6 months to 27 Jan., 1917.
Thermotank Shell Company ..	4·5-in. H.E., Mk. VIII.	27,088	38,826	43,341	4,515	30 11	7 months to 30 Dec. 1916.
Halleys Motors, Ltd.	60-pdr. H.E., Mk. VIII.	80,758	104,836	141,327	36,491	38 1½	10 months to 30 Jan., 1917.
		600,887	1,223,310	1,498,320	275,010		

[1] Compiled from a Memorandum, dated 19 April, 1917, filed in CR/4636.

APPENDIX IV.

(CHAPTERS VII–XIV.)

Personnel of Boards of Management.

The following list of persons who, at one time or another, served on the various Boards of Management has been compiled mainly from the list of original appointments made in 1915, and from the official list of those holding office in September, 1918.[1]

AREA I.

Grimsby.
J. W. Eason.*
T. W. Baskcomb.* †
E. J. Baskcomb.* †
J. S. Doig.* †
J. W. Jackson.†
W. H. Thickett.* † §

Hull.
C. Downs.* †
C. D. Holmes.* †
W. S. Hide.* †
G. F. Robinson, M.B.E.* †
A. H. Tyacke.* †

Tees-side.
T. W. Ridley.* †
G. Ritchie.
T. Westgarth.
H. B. Joy.
T. H. W. Chambers.* †
W. Hawdon.* †
F. P. Wilson.* †
G. N. Goodall, O.B.E.†

Tyne and Wear.
Hon. Sir C. Parsons.* †
Summers Hunter, C.B.E.* †
D. S. Marjoribanks, C.B.E.* †
H. Clark.* †
F. T. Dickinson.* †
H. Noble.* †
M. S. Gibb, C.B.E.*

AREA II.

Blackburn.
S. Crossley (died 1915).*
Sir W. Thom, K.B.E.* †
E. Keighley.* †
R. Crossley Livesey.* †
C. Whittaker.* †
J. H. Toulmin.* †

Bury.
T. D. Nuttall, C.B.E.* †
J. Byrom.* †
H. H. Hacking.* †
S. J. Watson.* †
J. E. Southern.* †
E. R. Seddon.* †
H. Mensforth, C.B.E.* †

East Cumberland.
W. T. Carr, C.B.E.* †
J. Morton. * †
R. D. Denman, M.P.* (resigned, 1915).
J. B. Pearson * (resigned, 1915).
W. P. Gibbings.
F. W. Purse.* †
J. P. Buck.
B. Carr.†

Liverpool.
J. E. Rayner * (died, 1918)
The Earl of Derby.* †
Charles Booth.* †
Sir G. Carter, K.B.E.* †
A. Galbraith.*
J. Bruce Ismay * (resigned, 1915).
J. Reney Smith.* †
H. B. Wortley.* †
Sir B. Johnson.
E. C. Given.*
Sir Charles Petrie, Bart.* †

Manchester.
(1) *Co-operative Group.*
Sir W. Collingwood, K.B.E.*
H. Mensforth, C.B.E.* †
F. G. Goodbehere.* †
Hans Renold.* †
A. P. Wood.* †
F. J. West, C.B.E.
J. Taylor, O.B.E.* †

(2) *National Shell Factory.*
Alderman J. Bowes.* †
Dr. Chapman.* †
H. Mensforth, C.B.E.* †
H. Lennox Lee.*
J. M. McElroy.* †
James Wood.†
G. R. Blackburn.†

North Wales.
W. Buckley, C.B.E.* †
R. M. Greaves.* †
E. S. Taylor.* †
E. R. Davies.* †
T. Sauvage.* †
W. G. Pickvance.* †

Rawtenstall and Bacup.
Lt.-Col. Craven Hoyle.* †
T. Whittaker.*
R. T. Hardman.* †
William Leach, M.B.E.* †
C. L. E. Stewart.* †

Rochdale.
R. W. Buckley.* †
Ald. J. Taylor.* †
G. Webster, O.B.E.† §
F. G. Goodbehere.*
J. Tweedale, M.B.E.* †
J. Standeven.*
H. Liebert.*
H. Jordan.
Alderman C. Redfern.*
R. Farrar.§
J. Hoyle.

West Cumberland.
Sir John Randles.* †
Ald. P. Walls.* †
J. Milburn.*
W. Burnyeat.* †
T. E. G. Marley.* †

AREA III.

Leeds.
Sir J. McLaren, K.B.E.* †
A. H. Meysey-Thompson.* †
B. Bagshawe, C.B.E.* †
C. James.* †
A. Campbell, O.B.E.* †

Barnsley.
W. P. Donald.* †
H. Foulstone.* †
J. W. Gillott.*
G. H. Hall.*
Frank Wood.†

Bradford.
E. Parkinson, O.B.E.* †
A. Liardet.* †
J. Ledgard.* †
C. W. Leather.* †
H. H. Illingworth.* †
P. J. Pybus, C.B.E.* †
H. W. Morley.* †

Halifax.
J. W. Wallis.* †
J. W. S. Asquith.* †
H. Butler, M.B.E.* †
H. Campbell.* †
G. Stirk.* †
J. Sagar.
H. G. Sagar.†

---

[1] D.A.O./Misc./1162, HIST. REC./R/1121/30. The list has been supplemented wherever possible by the names of those persons who were appointed after 1915, and for various reasons had resigned before September, 1918.

* Member appointed in 1915. † Member serving in September, 1918. § Hon. Secretary.

Area III (*continued*).

Huddersfield.
H. Broadbent.* †
Percy Brown.* †
H. A. Bennie Gray.* †
John Haigh.* †
A. H. Hardisty, O.B.E. (General Manager).* †

Keighley.
Sir Harry Smith, K.B.E.* †
J. Stell.* †
Prince Smith.* †
Richard Smith.* †

Rotherham.
A. E. Wells.* †
J. W. Baker, O.B.E.* †
W. Dyson.* †

Sheffield.
Col. Hughes, C.B., C.M.G.* (died, 1917).
Ald. A. J. Hobson.* †
Dr. W. Ripper, C.H.* †
J. C. Ward.†
L. B. Dixon.†
Col. A. W. Chadburn.†
F. M. Osborn.* †
W. Tyzack, O.B.E.* †
A. Davidson, C.B.E.* † §
D. Flather.†
W. M. Gibbons, O.B.E.† §

Wakefield.
P. C. Greaves.* †
G. W. Bousfield.*
G. E. Tennant.* †
J. W. Craven.* †
J. L. Moses.* †
D. G. Bailey, O.B.E.* †
C. Stokes.
John Lithgoe.†
J. W. Richardson.* †

Area IV.

Leicester.
S. A. Gimson.* †
C. Bennion.* †
J. A. Keay.* †
J. Pollard.* †
W. J. Wood* (resigned, 1915).
R. Dumas.* †

Birmingham.
Sir T. Harris Spencer, K.B.E.* †
Capt. R. S. Hilton.* †
G. W. Ryder, A.S.E.*
J. D. Steven.* †
E. Williams.* †
H. G. Atkinson.* †
J. Beard.†
H. E. Allen.
A. A. Chatwin.
G. C. Vyle.†
E. Jackson.†
E. Ll. Morcom.†

Coventry.
Sir A. Herbert, K.B.E.* †
C. Vernon Pugh.* †
Alex. Craig, C.B.E.* †
P. V. Vernon, O.B.E.* †

Derbyshire.
H. Davis* (died, 1917).
J. A. Aiton, C.B.E.* †
H. M. Gray.* †
J. Clarke.* †
W. Moore.* †
W. H. Richardson.* †
H. Fowler.*
J. de Looze* (resigned, 1915).

Lincolnshire.
Lt.-Col. J. S. Ruston.* †
W. T. Bell, O.B.E.* †
F. H. Livens.* †
P. W. Robson, O.B.E.* †
D. Walker.* †

Nottingham.
L. F. Pearson, C.B.E.* †
Col. W. H. Blackburn.
J. T. Richards.* †
J. G. Small.* †
J. W. Ullet.*
— Benson.†
Sir E. Jardine, Bart., M.P.†

Oxfordshire.
John Allen.* †
W. R. Morris, O.B.E.* †
H. G. Treadwell.*
H. W. Young.* †

Area V.

Cardiff.
W. Graham.* †
J. Elliot.* †
C. A. James.* †
D. E. Roberts.* †

Ebbw Vale.
Sir F. Mills, Bart.*
W. R. Lysaght, C.B.E.*
E. Steer.*
A. B. Sweet-Escott.
J. P. Whitehead.*

Llanelly.
R. Beaumont Thomas.*
Dan Williams.* †
W. J. Rees.* †
W. E. Clement.* †
A. J. H. Burn.* †
H. Coulson Bond.†
J. Holmes.†
D. J. Thomas, O.B.E.†

Newport (1916).
W. R. Lysaght, C.B.E.*
E. Steer.* †
J. P. Whitehead.*
F. Mills.* †
A. B. Sweet-Escott.* †
S. Whitmore.* †
J. Williams.* †
Sam Corbett.†

Swansea.
J. C. Davies, C.B.E.* †
F. W. Gibbins.* †
F. W. Gilbertson.* †
John Hodge, M.P.* †

Uskside.
W. Trimmer.*†
A. B. Sweet-Escott.
A. J. Stevens.* †
M. Mordey.* †
C. M. Jacobs.* †

Area VI.

West of England.
Sir P. K. Stothert, K.B.E.* †
J. P. Brazil.* †
W. Trimmer.* †
H. G. Hill.* †
C. A. Lister, C.B.E.* †
P. F. C. Williams.* † §

Cornwall.
J. Gilbert.* †
H. Bolitho, * † §
J. M. Holman.*
T. R. Grylls.* †
W. C. Stevens †

---

* Member appointed in 1915. † Member serving in September, 1918. § Hon. Secretary.

Areas VII & VII(*b*).

The Metropolitan Munitions Committee.

(1) *Trustees & Finance Board.*

B. Hall Blyth*.
Dr. W. C. Unwin.*
Sir John Snell.*
Sir J. W. Restler, K.B.E.*
F. Bailey.*
Sir W. Plender, K.B.E.*

(2) *Board of Management*

Sir J. W. Restler.* †
F. Bailey.* †
G. W. Partridge.* †
A. L. C. Fell.* †
W. A. Harper.* †
A. H. Shaw.* †
A. Ross.†
Dr. W. C. Unwin.†
A. H. Seabrook*
(resigned, 1915).
D. Milne Watson*
(resigned, 1915).
B. Hall Blyth.*
Sir W. Plender†
(Government representative).

East Anglia.

Sir W. Stokes, K.B.E.* †
F. H. Crittall.* †
M. Brooke.* †
W. H. Scott, O.B.E.* †
P. A. Sanders, O.B.E.* †
H. S. Jefferies* (died, 1917).

South East Midland.

W. H. Allen.* †
H. G. Allen.* †
H. S. Broom.* †
J. B. Peace, M.B.E.* †
A. F. Ilsley.†

Sussex.

B. K. Field.* †
P. Ellison.* †
A. Blackman.* †
J. Every.* †

Area VIII.

Glasgow.

Sir W. Rowan Thomson, K.B.E.* †
W. H. Coats.* †
A. S. Biggart.*
Sir A. Denny, Bart.* †
Sir Fred Lobnitz, K.B.E.* †
Hugh Reid.* †

Area IX.

Aberdeen.

Sir James Taggart, K.B.E. (Lord Provost).* †
R. S. Cook.* †
T. E. Heywood.* †
A. Wilson.* †
J. R. Allan.* †
F. L. McKinnon.* †
C. F. Wilson.* †
T. Mowat.†
J. T. Ewen, O.B.E.* † §.

Dundee.

W. Parker.* †
C. R. Orr, C.B.E.*
W. B. Thompson.* †
A. Ogilvie.* †
L. G. MacIntyre.* †
Sir H. Ogilvy, Bart.* †
D. Gorrie.†

Edinburgh.

Sir Robert Inches (Lord Provost).*
Sir J. L. MacLeod (Lord Provost).†
Sir J. Cowan.* †
Sir Malcolm Smith, K.B.E.* †
T. Hudson Beare.* †
George Pate, O.B.E.* †
S. Bastow.* †
W. A. Carter, O.B.E.†

---

* Member appointed in 1915. † Member serving in September, 1918. § Hon. Secretary.

Review of Output of Boards of Management.

Boards of Management.	AMMUNITION.										Grand Total.	Contracts placed through Boards of Management for other Types of Ammunition, Components and Miscellaneous Stores.[2]
	1915.[1]		1916.[1]		1917.		1918.		Total.			
Area.	Group.	N.S.F.	Group.	N.S.F.	Group.	N.S.F.	Group.	N.S.F.	Group.	N.S.F.		
I. Grimsby.												
4·5-in. H.E. ..	—	—	—	—	—	—	—	16,500	—	16,500	16,500	
6-in. H.E. ..	—	1,000	—	65,900	—	143,200	—	108,200	—	318,300	318,300	
Hull.												
4·5-in. H.E. ..	8,600	—	229,100	—	307,800	—	356,300	—	901,800	—	901,800	4·5-in. and 6-in. cast iron, conversion of defective 4·5-in. H.E. to powder-filled, gaines, primers, minor components.[3]
Chemical	—	—	—	—	—	—	7,000	—	7,000	—	7,000	
Tees-side.												
18-pdr. S. ..	—	—	135,200	—	305,600	—	373,000	—	813,800	—	813,800	Proof shot, minor components.
Tyne and Wear.												
18-pdr. H.E. ..	—	—	2,700	—	1,300	—	—	—	4,000	—	4,000	Proof shot, fuses, primers, minor components, conversion of defective 4·5-in. and 6-in. H.E. to powder-filled, machine tools.
4·5-in. H.E. ..	—	—	37,700	—	94,000	—	96,100	—	227,800	—	227,800	
6-in. H.E. ..	—	—	11,200	—	48,500	—	51,200	—	110,900	—	110,900	
8-in. H.E. ..	—	—	—	14,700	—	66,400	—	—	—	81,100	81,100	
II. Blackburn.												
13-pdr. S. ..	—	—	18,100	—	32,900	—	300	—	51,300	—	51,300	6-in. and 18-pdr. cast iron, conversion of defective 4·5-in. and 18-pdr. H.E. to powder-filled, proof shot, fuses, gaines, primers, minor components, trench mortar bombs.
18 pdr. H.E. ..	12,000	—	429,700	—	736,100	—	838,100	—	2,015,900	—	2,015,900	
18-pdr. Smoke	—	—	—	—	262,200	—	54,100	—	316,300	—	316,300	
4·7-in. H.E. ..	—	—	2,400	—	6,600	—	—	—	9,000	—	9,000	
4·5-in. H.E. ..	—	—	99,200	—	229,800	—	287,700	—	616,700	—	616,700	
6-in. H.E. ..	—	—	71,700	—	201,300	—	273,900	—	546,900	—	546,900	
Bury.												
18-pdr. H.E. ..	—	—	65,100	—	126,200	—	195,800	—	387,100	—	387,100	
Smoke	—	—	—	—	—	—	—	31,500	—	31,500	31,500	
4·5-in. H.E. ..	—	—	—	9,500	—	32,900	2,900	69,500	2,900	111,900	114,800	
East Cumberland.												
18-pdr. H.E. ..	—	—	—	40,500	11,500	99,500	29,000	164,600	40,500	304,600	345,100	Proof shot, friction tubes, minor components
Smoke	—	—	—	—	—	1,800	—	200	—	2,000	2,000	

Liverpool.												
13-pdr. H.E. ..	16,600	—	240,400	—	41,900	—	177,400	—	476,300	—	476,300	18-pdr. cast iron, fuses, gaines, primers, cartridge cases, minor components, shell forgings, gauges, trench mortar bombs.
S. ..	—	—	—	—	39,100	—	—	—	39,100	—	39,100	
18-pdr. H.E. ..	1,500	45,300	57,700	746,400	345,200	562,500	25,700	500,200	430,100	1,854,400	2,294,500	
S. ..	—	—	—	—	3,500	—	50,900	—	54,400	—	54,400	
Chemical	—	—	—	—	—	—	—	1,000	—	1,000	1,000	
Smoke	—	—	—	—	—	10,500	—	8,000	—	18,500	18,500	
2·75-in. H.E...	—	—	—	24,700	—	296,000	—	476,600	—	797,300	797,300	
4·5-in. H.E...	—	—	11,800	18,100	5,500	28,000	—	—	17,300	46,100	63,400	
60-pdr. H.E...	—	—	—	—	—	6,600	—	—	—	6,600	6,600	
6-in. H.E. ..	—	—	69,200	52,500	244,900	187,000	150,000	192,400	464,100	431,900	896,000	
8-in. H.E. ..	—	—	5,300	—	1,900	13,900	—	12,700	7,200	26,600	33,800	
Manchester.												
18-pdr. H.E. ..	165,800	—	1,220,400	—	1,504,000	—	1,417,000	—	4,307,200	—	4,307,200	1½-pdr. H.E., 3-in., 20-cwt. A.A. (H.E.), 6-in., 4·5-in. and 18-pdr. cast iron, conversion of defective 4·5-in. H.E. to powder-filled, proof shot, 6 in. Baldwin shell rectification fuses, primers, cartridge cases, gaines, friction tubes, shell forgings, minor components, gauges, bomb carcases, trench mortar bomb-heads packing cases, steel, tanks and tank parts, A.G.S. parts, machine gun emplacements, searchlight projectors, arc lamps, etc.
S. ..	—	—	—	—	324,100	—	844,000	—	1,168,100	—	1,168,100	
Smoke	—	—	—	—	441,700	—	57,500	—	499,200	—	499,200	
H.E. .. (A.A.)	—	—	15,500	—	12,600	—	—	—	28,100	—	28,100	
2·75-in. H.E...	—	—	26,100	—	24,900	—	—	—	51,000	—	51,000	
S. ..	—	—	81,200	—	158,200	—	—	—	239,400	—	239,400	
75-mm. S. ..	—	—	—	—	62,700	—	—	—	62,700	—	62,700	
3-in. H.E. (A.A.)	—	—	8,000	—	49,800	—	—	—	57,800	—	57,800	
4·5-in. H.E. ..	11,300	—	484,200	8,000	355,300	29,100	203,900	51,800	1,054,700	88,900	1,143,600	
Chemical	—	—	237,800	—	555,700	—	633,500	—	1,427,000	—	1,427,000	
6-in. H.E. ..	700	—	85,200	—	253,200	—	290,600	—	629,700	—	629,700	
8-in. H.E. ..	—	—	2,000	—	10,200	—	4,100	—	16,300	—	16,300	
9·2-in. H.E. ..	—	—	4,000	—	18,000	—	8,500	—	30,500	—	30,500	
N. Wales.												
13-pdr. H.E. ..	—	—	—	—	—	44,000	—	10,600	—	54,600	54,600	Proof shot, minor components, trench mortar bomb heads, A.G.S. parts.
18-pdr. H.E. ..	—	—	—	22,700	—	318,100	—	490,600	—	831,400	831,400	
S. ..	—	—	—	—	174,200	—	374,900	—	549,100	—	549,100	
Smoke	—	—	—	—	—	5,000	—	4,000	—	9,000	9,000	
Rawtenstall and Bacup.												
4·5-in. H.E. ..	—	—	—	15,900	—	61,400	—	79,600	—	156,900	156,900	
Rochdale.												
18-pdr. H.E. ..	—	—	—	—	14,700	—	30,000	—	44,700	—	44,700	18-pdr. cast iron, proof shot, fuses, gaines, primers, minor components, trench mortar bombs.
Smoke	—	—	—	—	800	—	2,100	—	2,900	—	2,900	
4·5-in. H.E. ..	—	—	—	—	12,500	—	9,600	—	22,100	—	22,100	
6-in. H.E. ..	—	—	19,400	10,900	42,600	39,800	10,900	39,500	72,900	90,200	163,100	
West Cumberland.												
18-pdr. H.E. ..	—	—	—	38,200	—	146,300	—	167,900	—	352,400	352,400	Minor components.
Smoke	—	—	—	—	—	3,500	—	3,500	—	7,000	7,000	

[1] The figures for 1915 and 1916 are not always complete as full returns for 1915 and the first quarter of 1916 are not available in the case of every Board.

[2] Based on *Order and Supply Lists ; Firms and Factories Lists ; Factories and Products Lists ;* D.A.O./Misc /1394.

[3] "Minor Components" includes adapters, base plates, burster containers, cartridge clips, cartridge exploders, containers for chemical shell, copper bands and plates, detonators, exploder containers, exploders, nose bushes, plugs, screws, shell heads, shell parts, sockets, taps, washers. The number and types of minor components varied in the case of each Board.

Boards of Management.	AMMUNITION.											Contracts placed through Boards of Management for other Types of Ammunition, Components, and Miscellaneous Stores.
	1915.		1916.		1917.		1918.		Total.		Grand Total.	
Area.	Group.	N.S.F.	Group.	N.S.F.	Group.	N.S.F.	Group.	N.S.F.	Group.	N.S.F.		
III. Barnsley.												
4·5-in. H.E. ..	—	—	—	56,200	—	143,500	—	104,900	—	304,600	304,600	Minor components.
Bradford.												
4·5-in. H.E. ..	—	14,000	—	180,000	—	247,600	—	212,400	—	654,000	654,000	Fuses, gaines, minor components.
Chemical	—	—	—	1,200	—	22,600	—	—	—	23,800	23,800	
Halifax.												
18-pdr. H.E. ..	32,000	—	178,300	—	207,400	—	149,300	—	567,000	—	567,000	6-in., 4·5-in. and 18-pdr. cast iron fuses, primers, gaines, minor components, cast iron bomb heads.
18-pdr. H.E. ..	—	—	76,800	—	107,800	—	49,600	—	234,200	—	234,200	
Chemical	—	—	52,300	—	145,300	—	66,500	—	264,100	—	264,100	
6-in. H.E. ..	—	—	23,400	—	83,600	—	129,100	—	236,100	—	236,100	
Huddersfield.												
18-pdr. H.E. ..	—	3,100	—	64,300	—	182,700	—	220,000	—	470,100	470,100	Proof shot, minor components.
Keighley.												
18-pdr. H.E. ..	—	23,600	—	188,300	7,000	127,600	16,000	149,100	23,000	488,600	511,600	3·7-in. H.R.H.E., minor components.
Chemical	—	—	—	—	—	—	—	131,300	—	131,300	131,300	
3·7-in. H.E. ..	—	—	—	—	—	140,300	—	11,900	—	152,200	152,200	
6-pdr. A.A. ..	—	—	—	19,100	—	2,100	—	—	—	21,200	21,200	
Leeds.												
4·5-in. H.E. ..	—	37,300	—	105,200	—	1,500	—	—	—	144,000	144,000	Guns, gun repair, proof shot, fuses, primers, gaines, friction tubes, cartridge case repair, minor components, trench mortar bombs, ammunition boxes, hemp.
6-in. H.E. ..	—	—	—	167,700	—	394,100	—	430,400	—	922,200	922,200	
8-in. H.E. ..	—	—	—	—	—	8,600	—	5,200	—	13,800	13,800	
9·2-in. H.E. ..	—	—	—	66,600	—	191,800	—	172,900	—	431,300	431,300	
12-in. H.E. ..	—	—	—	—	—	100	—	6,500	—	6,600	6,600	
15-in. H.E. ..	—	—	—	1,400	—	4,600	—	1,300	—	7,300	7,300	
Rotherham.												
4·5-in. H.E. ..	—	700	—	82,600	—	156,900	—	174,200	—	414,400	414,400	
Chemical	—	—	—	—	—	10,500	—	—	—	10,500	10,500	
Sheffield.												
18-pdr. H.E. ..	1,500	—	153,500	—	56,000	—	49,800	—	260,800	—	260 800	Conversion of defective 6-in. H.E. to powder-filled fuses, gaines, primers, friction tubes, minor components, gauges, trench mortar bombs, helmets, ammunition boxes, grenades, trench mortars, gun forgings, brass rods, copper strip.
Smoke	—	—	—	—	90,600	—	—	—	90,600	—	90,600	
4·5-in. H.E. ..	—	—	14,600	—	60,800	—	20,300	—	95,700	—	95,700	
6-in. H.E. ..	—	—	13,500	—	11,300	—	3,300	—	28,100	—	28 100	

Wakefield.												
18-pdr. S. ..	19,500	—	246,600	—	405,200	—	512,800	—	1,184,100	—	1,184,100	Gaines, minor components, trench mortar bombs, tank parts, railway materials.
IV. Birmingham.												
18-pdr. H.E.	9,200	—	84,600	35,500	122,800	15,000	83,400	6,500	300,000	57,000	357,000	Fuses, gaines, primers, friction and detonating tubes, cartridge cases, minor components, proof shot, gauges, dummy night tracers, trench mortar bombs, brass and copper band tubing, steel hammers, shearing wire, ammunition boxes, A.G.S. parts.
S.	—	—	26,100	—	78,500	—	118,400	—	223,000	—	223,000	
4.5-in. H.E.	5,700	—	134,000	296,600	149,200	687,000	206,600	752,700	495,500	1,736,300	2,231,800	
6-in. H.E. ..	—	—	700	—	13,100	—	11,200	—	25,000	—	25,000	
9.2-in. H.E. ..	—	—	—	—	—	27,000	—	22,200	—	49,200	49,200	
Coventry.												
18-pdr. H.E. ..	144,300	—	274,600	—	47,400	—	43,200	—	509,500	—	509,500	Fuses, gaines, primers, friction tubes, minor components, gauges, trench mortar bombs, tank parts, machine tools, mechanical transport supplies, Admiralty stores, aero engines, aeroplanes.
2.75-in. H.E. ..	—	—	38,500	—	25,500	—	—	—	64,000	—	64,000	
4.5-in. H.E. ..	6,200	—	30,800	—	15,400	—	7,300	—	59,700	—	59,700	
Chemical ..	—	—	23,200	—	600	—	—	—	23,800	—	23,800	
Derbyshire.												
18-pdr. H.E. ..	16,000	—	76,600	—	40,000	—	16,600	—	143,200	—	143,200	4·5-in. and 18-pdr. cast iron, proof shot, gaines, friction tubes, minor components, gauges, trench mortar bombs, ammunition boxes, primers, aerial bombs, aero engine cylinders.
S.	—	—	—	—	89,000	—	201,500	—	290,500	—	290,500	
4.5-in. H.E. ..	—	400	—	150,000	—	258,400	—	137,500	—	546,300	546,300	
4.7-in. Chemical	—	—	—	—	—	3,400	—	—	—	3,400	3,400	
Leicester.												
18-pdr. H.E. ..	—	—	8,900	—	97,300	—	71,200	—	177,400	—	177,400	Proof shot, conversion of defective 4·5-in. H.E. to powder-filled, primers, friction tubes, gaines, minor components, trench mortar bombs.
4.5-in. H.E. ..	15,500	—	185,900	—	246,400	—	292,300	—	740,100	—	740,100	
6-in. H.E. ..	—	—	—	—	39,000	—	67,800	—	106,800	—	106,800	
Lincoln.												Minor components, trench mortar bombs.
Nottingham.												
13-pdr. H.E. ..	—	9,400	—	324,300	—	13,100	—	—	—	346,800	346,800	Primers, friction tubes, minor components.
18-pdr. H.E. ..	—	—	—	—	—	543,300	—	564,100	—	1,107,400	1,107,400	
Smoke ..	—	—	—	—	—	—	—	1,900	—	1,900	1,900	
2.75-in. H.E. ..	—	—	—	46,700	—	7,300	—	—	—	54,000	54,000	
Oxfordshire.												Minor components, trench mortar bombs, ammunition boxes, mine sinkers.
V. Cardiff.												
18-pdr. H.E. ..	—	3,200	—	35,200	—	187,200	—	272,300	—	497,900	497,900	Proof shot, minor components.
Ebbw Vale.												
18-pdr. H.E. ..	—	6,700	1,200	82,500	—	—	—	—	1,200	89,200	90,400	Friction tubes, minor components.
Llanelly.												
18-pdr. H.E. ..	—	—	—	—	—	75,900	—	430,000	—	505,900	505,900	
6-in. H.E. ..	—	—	—	44,400	—	256,100	—	364,900	—	665,400	665,400	

Boards of Management. / Area.	AMMUNITION. 1915 Group.	1915 N.S.F.	1916 Group.	1916 N.S.F.	1917 Group.	1917 N.S.F.	1918 Group.	1918 N.S.F.	TOTAL Group.	TOTAL N.S.F.	Grand Total.	Contracts placed through Boards of Management for other Types of Ammunition, Components and Miscellaneous Stores.
Newport.												
60 pdr. H.E. ..	—	—	—	133,500	—	298,600	—	169,100	—	601,200	601,200	Friction tubes, minor components, trench mortar bomb heads.
Swansea.												
18-pdr. H.E. ..	—	2,700	—	76,500	66,600	80,200	41,000	55,700	107,600	215,100	322,700	Primers, minor components, trench mortars, bomb heads.
4.5-in. H.E. ..	—	—	—	51,400	—	198,000	—	170,500	—	419,900	419,900	
Uskside.												
18-pdr. H.E. ..	—	2,100	—	21,000	—	1,400	—	—	—	24,500	24,500	Proof shot, gauges, parts for guns and carriages, Admiralty stores.
4.5-in. H.E. ..	—	—	—	—	—	—	—	16,100	—	16,100	16,100	
6-in. H.E. ..	—	—	—	21,800	—	55,400	—	42,500	—	119,700	119,700	
VI. Cornwall.												
18 pdr. H.E. ..	—	—	160,600	—	347,700	—	382,500	—	890,800	—	890,800	Conversion of defective 4·5-in. H.E. to powder-filled, proof shot, gaines, minor components, trench mortar bomb heads
4.5-in. H.E. ..	—	—	35,500	—	18,000	—	—	—	53,500	—	53,500	
West of England												
18-pdr. H.E. ..	—	39,400	—	858,500	—	1,111,200	—	1,024,100	—	3,033,200	3,033,200	3-in. 20-cwt. A.A. (H.E.), proof shot, fuses, primers, gaines, tubes, cartridge cases, minor components, ammunition boxes, piston rings for aero engines.
S. ..	—	—	—	—	152,300	—	519,500	167,200	671,800	167,200	839,000	
3-in. S. (A.A.)	—	—	—	—	112,500	—	19,900	—	132,400	—	132,400	
9.2-in H.E. ..	—	—	—	—	12,200	—	21,900	—	34,100	—	34,100	
VII. East Anglia.												
13-pdr. H.E. ..	—	—	181,000	—	65,600	—	26,400	—	273,000	—	273,000	18-pdr. cast iron, proof shot, fuses, gaines, primers, tubes, minor components, aero engines, aeroplanes, resin, copper balls, trench mortars, Admiralty stores, mechanical transport supplies.
18-pdr. H.E. ..	44,800	—	408,000	—	841,200	—	691,300	—	1,985,300	—	1,985,300	
S. ..	—	—	58,900	—	284,100	—	505,800	—	848,800	—	848,800	
Smoke	—	—	—	—	33,300	—	—	—	33,300	—	33,300	
6-pdr.A.A.&Tank	—	—	5,900	—	—	—	—	—	5,900	—	5,900	
60-pdr. H.E. ..	—	—	63,500	—	115,300	—	70,500	—	249,300	—	249,300	
4.5-in. H.E. ..	—	—	266,700	—	379,300	—	355,700	—	981,700	—	981,700	
6-in. H.E. ..	—	—	15,600	—	36,400	—	20,900	—	72,900	—	72,900	
Metropolitan.												
13-pdr. H.E. ..	—	—	237,400	—	35,900	—	77,800	—	351,100	—	551,100	6-pdr. Davis gun, 3 in. 20-cwt. A.A. (H.E.), 6-in. and 4·5-in. cast iron, 4-in. H.E. rectification, conversion of defective 6-in. and 4·5-in. to powder-filled, proof shot, fuses, gaines, primers, tubes, minor components, gauges, trench mortar bombs.
S. ..	—	—	2,100	—	49,900	—	900	—	52,900	—	52,900	
15-pdr. H.E. ..	—	—	200	—	—	—	900	—	1,100	—	1,100	
18-pdr. H.E. ..	1,100	—	666,200	—	919,300	—	483,700	—	2,070,300	—	2,070,300	
S. ..	—	—	196,900	—	749,900	—	629,200	—	1,576,000	—	1,576,000	
Smoke	—	—	—	—	76,900	—	400	—	77,300	—	77,300	

10-pdr. H.E. ..	—	—	2,500	—	—	—	—	—	2,500	—	2,500	grenades, steel helmet stampings, gun metal blanks, wheels, screws, tools, periscope cases, ammunition boxes, height-finding instruments, rifle tools, collection and disposal of swarf.
2·75-in. H.E. ..	—	—	900	—	8,800	—	—	—	9,700	—	9,700	
S. ..	—	—	—	—	56,200	—	1,000	—	57,200	—	57,200	
2.95-in. H.E. ..	—	—	—	—	21,100	—	—	—	21,100	—	21,100	
6-pdr. A.A. & Tank	—	—	—	—	4,000	—	—	—	4,000	—	4,000	
3-in. H.E. (A.A.)	—	—	104,300	—	176,200	—	66,600	—	347,100	—	347,100	
60-pdr. S. ..	—	—	125,700	—	131,000	—	—	—	256,700	—	256,700	
4.5-in. H.E. ..	—	—	204,900	—	612,100	115,000	338,900	69,800	1,155,900	184,800	1,340,700	
6-in. H.E. ..	—	—	120,000	—	195,400	—	76,600	—	392,000	—	392,000	
9.2-in. H.E. ..	—	—	20,600	—	67,200	—	43,800	—	131,600	—	131,600	
1-pdr. H.E. ..	—	—	11,400	—	2,700	—	—	—	14,100	—	14,100	
South-East Midlands.												
13-pdr. H.E. ..	9,200	—	219,700	—	5,700	—	107,800	—	342,400	—	342,400	Proof shot, conversion of defective 4·5 in. H.E. to powder-filled, friction tubes, primers, minor components, fuse parts, trench mortar bombs.
18-pdr. H.E. ..	—	—	—	—	196,400	—	227,400	—	423,800	—	423,800	
4.5-in. H.E. ..	—	—	74,400	—	113,100	—	159,800	—	347,300	—	347,300	
6-in. H.E. ..	—	—	—	—	4,600	—	6,000	—	10,600	—	10,600	
Sussex.												Fuses, minor components, trench mortar bombs, ammunition boxes.
VIII. Glasgow[1]												Proof shot, shell forgings and stampings,
18-pdr. H.E. ..	—	—									387,000	fuses, gaines, tubes, minor components
60-pdr. H.E. ..	—	—									166,314	explosives, gauges, mines and sinkers,
4.5-in. H.E. ..	—	—									102,637	trench mortars, trench mortar bombs,
S. ..	—	—									77,000	projector tubes and drums, gas cylinders,
6-in. H.E. ..	—	—									86,560	Strombos cylinders, compressor plant,
8-in. H.E. ..	—	—									64,902	ammunition and tin boxes, wrenches,
15-in. H.E. ..	—	—									13,280	steel plates, tanks, aircraft supplies.
IX. Aberdeen.												Minor components, trench mortar bombs,
4.5-in. H.E. ..	200	—	49,800	—	—	—	—	—	50,000	—	50,000	grenade dischargers, Lewis gun castings,
6-in. H.E. ..	—	—	19,900	—	34,800	34,600	59,400	65,100	114,100	99,700	213,800	ammunition boxes.
Dundee.												
18-pdr. H.E. ..	—	11,500	—	201,800	—	339,100	48,600	8,700	48,600	561,100	609,700	18-pdr. cast iron, minor components, trench
2.75-in. S. ..	—	—	—	1,300	—	3,000	—	—	—	4,300	4,300	mortar bombs, ammunition boxes.
Edinburgh.												
60-pdr. H.E. ..	—	—	103,900	—	157,000	—	—	—	260,900	—	260,900	18-pdr. cast iron, proof shot, fuses, primers,
4.5-in. H.E. ..	—	—	73,700	—	138,700	—	63,000	—	275,400	—	275,400	gaines, minor components, trench mortar
6-in. H.E. ..	—	—	2,800	—	9,400	—	—	—	12,200	—	12,200	bombs, grenades, aluminium powder, ammunition boxes, telescope signalling stands, director stands.

[1] Yearly figures are not available. The total figures given are for the principal types of shell only and represent the output of firms whose contracts were arranged by the Director of Munitions, but who were not included in the "Glasgow Shell Scheme" (see Appendix III). The output of the regular armament firms and of the National Projectile Factories is not included.

(3387) N

APPENDIX V—*continued.*

Boards of Management.	AMMUNITION.											Contracts placed through Boards of Management for other Types of Ammunition, Components and Miscellaneous Stores.
	1915.		1916.		1917.		1918.		*TOTAL.*		Grand Total.	
Area.	Group.	N.S.F.	Group.	N.S.F.	Group.	N.S.F.	Group.	N.S.F.	Group.	N.S.F.		
X. Cork.												
4·5 in. H.E. ..	—	—	—	—	—	10,400	—	21,800	—	32,200	32,200	
Dublin.		—										
13-pdr. H.E. ..	—	—	49,900	—	36,300	—	100	—	86,300	—	86,300	Conversion of defective 4·5 in. H.E. to powder-filled, fuses, primers, cartridge cases, gaines, minor components, ammunition boxes, felloes, bomb pistols, A.G.S. parts.
18-pdr. H.E. ..	—	—	86,900	113,800	233,900	230,800	242,900	180,700	563,700	525,300	1,089,000	
Smoke ..	—	—	—	—	—	—	—	12,400	—	12,400	12,400	
4.5-in. H.E. ..	—	—	20,900	—	30,800	—	400	—	52,100	—	52,100	
9.2-in. H.E. ..	—	—	—	—	—	2,400	—	3,700	—	6,100	6,100	
Galway.												
18 pdr. H.E. ..	—	—	—	—	—	11,700	—	21,900	—	33,600	33,600	
XI. Belfast.												
13-pdr. H.E. ..	—	—	113,600	—	28,200	—	34,700	—	176,500	—	176,500	Gaines, primers, minor components, gauges, trench mortar bombs, grenades, ammunition boxes, aircraft supplies.
18-pdr. H.E. ..	—	—	41,300	—	144,700	—	158,000	—	344,000	—	344,000	
S. ..	—	—	—	—	110,500	—	281,900	—	392,400	—	392,400	
4.5-in. H.E. ..	—	—	3,400	—	2,700	—	—	—	6,100	—	6,100	
6-in. H.E. ..	—	—	13,200	—	21,900	—	5,800	—	40,900	—	40,900	
9.2-in. H.E. ..	—	—	200	—	—	—	—	—	200	—	200	

HISTORY OF THE MINISTRY OF MUNITIONS

VOLUME II

GENERAL ORGANISATION FOR MUNITIONS SUPPLY

PART III

MUNITIONS ORGANISATION IN THE UNITED STATES OF AMERICA

1921.

Volume II

GENERAL ORGANISATION FOR MUNITIONS SUPPLY

PART III

MUNITIONS ORGANISATION IN THE UNITED STATES OF AMERICA

CONTENTS.

(3241) Wt.7109/X3756 250 6/21 Harrow G.36

CHAPTER III.—*contd.*

CHAPTER IV.

The Growth of the Munitions Organisation in America in 1915 and 1916.

CHAPTER V.

Administrative Developments in 1917 and 1918.

CHAPTER V.—*contd.*

CHAPTER VI.

The Work of the Ministry of Munitions in Organising Production of Munitions in the United States.

CHAPTER VII.

The Inspection of American Munitions.

CHAPTER VIII.

Negotiations with the United States Government regarding Munitions Supply, 1917 to 1918.

APPENDICES.

CHAPTER I.

INTRODUCTORY.

The importance of the munitions and munitions materials obtained by Great Britain and the other European belligerents from the United States of America can hardly be over-estimated. In a war which was first and foremost a war of munitions, British sea power enabled the Allies to draw on the resources of the whole American continent, while closing this source of supply to Germany and her allies of Central Europe. It was a struggle in which the two great industrial nations of Europe—Great Britain and Germany—faced each other, and the fact that it was possible for the former and impossible for the latter to obtain munitions and munitions materials from the third great industrial community of the world may well have been decisive.

The great extension of the doctrine of contraband of war inevitable in a war not of armies alone, but of nations, involved the practical disappearance of German trade with the United States; the stream that trickled obscurely and dangerously through the border of neutral States, or the exploits of a solitary submarine merchantman, may for all practical purposes be neglected.[1] But the only limit to the assistance the Allies could obtain from America was their resources in money and credit, and though the wider financial policy of the war does not concern us here, it is important to notice that by the transfer of gold, by the sale or pledging of British-owned American securities, and by the proceeds of a loan raised in the United States, the British Government was able to finance purchases of munitions in the United States, both for herself and her Allies, on an enormous scale. There were one or two serious crises, notably in the autumn of 1915 and the autumn of 1917, when the Treasury warned the Ministry of Munitions that the work of financing these huge purchases was unusually difficult, but by these various devices the dollar exchange was kept "pegged" at an artificial level, and the supply of essential munitions was maintained.[2] The entry of the United States into the war relieved Great Britain of part of the burden of financing her European Allies during the last year of the war, but the cost of the supplies obtained for them by British credit represented a large portion of the debt owing to the United States when the war ended.

Throughout the war, as will be seen elsewhere, Great Britain was practically dependent upon the United States of America for material for propellant manufacture, for a large proportion of her explosives material,[3] and for essential metals like copper and aluminium.[4] She depended to a considerable extent upon the United States for shell

---

[1] Vol. VII, Part I.
[2] Vol. II, Part I.
[3] Vol. VII, Part IV.
[4] Vol. VII, Part III.

steel and other steel,[1] for machine tools and mineral oils, while among other valuable imports were railway material, and agricultural machinery. Of finished munitions, gun ammunition took the first place in weight and value.[2] In addition to considerable orders for complete rounds of 18 pdr. ammunition already placed, very large orders for shells for the heavy howitzers included in the first Ministry of Munitions gun programmes, were placed by Mr. Lloyd George in the autumn of 1915, and it was not until the National Projectile Factories reached their designed output in the winter of 1916–17, that the dependence of heavy artillery on American shell decreased. As soon as British and Canadian factories were able to supply the armies with heavy shell American orders were cut off, though, owing to the greatly increased demand for 6-in. ammunition, shell of this type was obtained from America down to the end of the war.

Next in importance came guns and rifles and machine guns; 18 pdr. and 8-in. howitzers were manufactured on a considerable scale.[3] The large deliveries of the special pattern of the British service rifle made from America, though late in maturing, were of great value;[4] while Lewis guns were also obtained in the United States on a large scale.[5]

For financial and other reasons it was preferable for Great Britain to import munitions materials rather than finished munitions from the United States, and as soon as the productive capacity of the United Kingdom had been expanded sufficiently this general policy was adopted. It became marked from the beginning of 1917 onwards, but during the last year of the war, when the tonnage difficulties, due to the submarine campaign, were accentuated by the necessity of conveying United States troops and their equipment to Europe, the policy of preferring materials to finished munitions was checked by the necessity of economising shipping.

Munitions bought in America were always costly as compared with prices and costs in the United Kingdom, but the vital necessity of increasing supply outweighed financial considerations.

The effect of Allied dependence upon and competition for these costly supplies was however checked to some extent and prices kept within reasonable bounds by the gradual evolution of a system of centralised purchasing, at first for Great Britain, and then for the Allies.[6] The first experiment in this direction, the appointment of an American banking firm to act as sole purchasers for all War Office and some Admiralty requirements, was a bold experiment, but it was justified by its success.[7] Though there was some criticism of the scale of the agents' remuneration, the financial results of checking competition in the American market, quite apart from the ability shown by the agents in finding new sources of supply and stimulating

[1] Vol. VII, Part II.
[2] Vol. X, Part III.
[3] Vol. X, Part I.
[4] Vol. X, Part IV.
[5] Vol. X, Part V.
[6] Vol. II, Part VIII; Vol. VII, Part I.
[7] See below, pp. 30, 43.

production, far outweighed any question of the amount of the agents' commission.

One of the first acts of Mr. Lloyd George, after the formation of the Ministry of Munitions, was the decision that there must be an increased exploitation of American resources, and he sent Lord Rhondda (then Mr. D. A. Thomas) on a mission to the United States and Canada to assist in developing the American market.[1] The organisation set up by him, and developed by Mr. (later Sir Ernest) Moir, expanded into an American branch of the Ministry of Munitions, which took over much of the work of the commercial agents, including arrangements for watching deliveries and speeding up progress on contracts, which had been only imperfectly performed by the commercial agents.[2] But, even if it had been possible to set up such a British organisation at an earlier date, which is doubtful, it is not certain whether it would have been good policy to do so, as the commercial agency agreement kept the British Government in the background, and diminished the objection felt by a large section of the American public to supplying munitions to belligerents in a war in which America was neutral.[3]

The development of the American Branch of the Ministry of Munitions and its work are outlined in the pages that follow.[4] Its chief achievements on the administrative side are, perhaps, the new machinery for obtaining maximum deliveries, on the lines adopted by the supply departments at home; the improved organisation of the inspection arrangements which, as in the Ministry of Munitions, brought the Inspection Department into closer touch with the supply departments, bridging the gap between civilian and military administration; and the further centralisation of British purchases, the Ministry organisation in the United States being generally recognised as the sole channel for placing orders. This concentration, achieved with difficulty owing to the reluctance of Government departments and private buyers to give up their usual channels of supply, became still more imperative in the last eighteen months of the war, when financial difficulties and the shortage of tonnage made it necessary to scrutinise closely and cut down where possible all programmes for munitions supply from the United States. A similar concentration of Allied purchases was obviously desirable. The commercial agency agreement and the responsibilities accepted by Great Britain for her Allies, especially Russia, had put a stop to direct competition between the Allies in individual negotiations,[5] but there was far too little mutual consultation on the general policy governing munitions purchases, and some suspicion that the Allies were selfishly pursuing their own ends, instead of distributing American supplies to the advantage of the Alliance as a whole.[6]

---

[1] See below, p. 43.
[2] See below, p. 55.
[3] See below, pp. 36, 45.
[4] See below, p. 59, *seq.*
[5] See below, p. 37, and Vol. II, Part VIII.
[6] Vol. II, Part VIII.

The entry of the United States into the war, and the insistence of its Government on joint action by the Allies stimulated, as will be seen below, the tardy growth of inter-Allied organisation; moreover the principles laid down by that Government as to the price at which materials and munitions should be supplied, helped the Allies to wage war with joint resources, as well as for a common purpose.

From the narrower standpoint of the supply of munitions to the British armies, the declaration of war by the United States Government was an embarrassment; the Government took over the capacity of many firms who had been trained for munitions production by the American Department of the Ministry, and its large programme accentuated the scarcity of munitions materials. Fortunately, however, as is shown elsewhere,[1] the industrialisation of Canada had proceeded so far, and the organisation of munitions supply there had been developed so rapidly, that Great Britain was able to rely to an increasing extent upon Canadian, and to a decreasing extent upon United States' munitions, with excellent financial and political results.

As soon as America came into the war, special missions were sent out to give any technical help that might be asked for in facilitating munitions production, while the accumulated experiences of two and a half years of war with regard to types of guns and ammunition, the character and behaviour of various explosives, the relation between demand programmes and manufacturing programmes, the most recent developments of the newer weapons of war—tanks, aircraft, chemical gases, trench mortars and so on—was placed at the disposal of the United States Government. But the United States failed to profit fully by this policy, and instead of adopting well-tried French and British types outright, experimented with purely American designs or with American modifications of existing designs, which involved much delay and disappointment.

The German advance in 1918, however, and the danger to the Allied cause, induced the United States authorities to accept French and British types of munitions in which each had specialised. During the battles of 1918 the American armies fought with French and British guns, aircraft and tanks, while the British Ministry of Munitions undertook to supply the American armies during 1919 with heavy artillery and ammunition, on a scale sufficient to keep them in the field until the results of an organisation for munitions production, planned on a scale that dwarfed even the achievements of the European belligerents, matured.

The pages that follow, and the subsequent part dealing with Canada, outline the methods by which the resources of the New World were utilised in the European struggle.

---

[1] Vol. II, Part IV.

CHAPTER II.

THE MORGAN AGREEMENT.

I. The Negotiation of the Commercial Agency Agreement.

The placing of orders for munitions in the United States by the War Office and the Admiralty dates from the first months of the war, the first considerable orders for shells, explosives, and so on being negotiated by the War Office in October, 1914,[1] and the first rifle orders in November. Meanwhile large orders were being placed for metals and raw materials, especially explosives materials, for as soon as the stocks existing on the outbreak of the war were used up the supply of explosives depended upon the importation of certain materials (such as acetone) from America.[2] The volume of orders grew rapidly when the nature and extent of the struggle in which the Allies were engaged began to be realised, and by the end of the year the British War Departments, the Governments of the Allies, and armament firms in all the Allied countries were negotiating in the United States for munitions and munitions materials and machinery. The confusion and waste which resulted from this competitive buying were realised, and in December, 1914, the adoption of a policy of centralised purchasing through a commercial agent was advocated. The position at this date was summarised by the Director of Army Contracts as follows :[3]

> "The policy followed in the early months of the war of negotiating with American manufacturers directly, or through their London representatives, was found to result in great confusion and waste of funds. The United States swarmed with commercial adventurers who disturbed the market and forced up prices by the buying and selling of options on war materials, which were eventually offered to the War Office at prices covering a whole series of middlemen's commissions. Manufacturers had had no certain means of distinguishing these men from genuine War Office agents, and their irregular operations tended to throw discredit on the whole system of Government purchasing. In addition, there were special difficulties attaching to the purchase of munitions of war. The enormous demand had tempted into the American armaments trade many firms with no previous experience of the work and brought into being a number of new undertakings, some of them of a very dubious character. These untried firms could not safely be employed on War Office contracts

---

[1] *e.g.* Order for 4·7 inch lyddite (Bethlehem Steel Company), 14 October, 1914 (S./6972) ; for nitro-cellulose powder (du Pont de Nemours), October, 1914.

[2] Vol. X, Part IV, p. 97.

[3] Memorandum by the Director of Army Contracts, June, 1915. (HIST. REC./R./1141/2).

without careful inquiry into their antecedents and technical capacity. The heavy calls that had already been made on the supplies of machinery and skilled labour, and the threatened dearth of certain metals made it more and more important for the War Office to satisfy themselves that new contracts should be so placed as not to divert labour or material from firms already engaged on armament work. It was in order to meet these difficulties and to insure co-ordination and economy in their purchasing arrangements that the Army Council decided to adopt the policy of centralising all purchases in the States in the hands of a single firm of agents. Messrs. Morgans were selected, with Cabinet approval, as the firm best qualified by their reputation and intimate knowledge of American commercial and industrial conditions to undertake the duty."

In a later report Mr. D. A. Thomas expressed his conviction of the soundness of the policy of employing a single purchasing agent. He continued:

"The question whether the firm of J. P. Morgan & Company was best qualified to undertake this work is more debatable, and if they had relied only on their own organisation, which was purely a financial and not a purchasing organisation, I question whether they could have handled the business as effectively as other concerns which might be named. They fortunately succeeded, however, in obtaining the services of Mr. E. R. Stettinius, President of the Diamond Match Company, whose ability, knowledge, and experience are probably unrivalled in the United States. Messrs. Morgan wisely entrusted to Messrs. Stettinius the task of forming and organising an export department wholly distinct from their existing organisation, and gave him a free hand to import men of business experience to take charge of the various sections of that Department."

The covenant appointing Messrs. J. P. Morgan & Company commercial agents for the British Government was signed on 15 January, 1915, by Sir Reginald Brade on behalf of the Army Council, by Sir William Graham Greene on behalf of the Admiralty, and by Mr. H. P. Davison on behalf of Messrs. J. P. Morgan & Company.[1]

The financial arrangements involved in the agreement were discussed by representatives of the Treasury, the War Office, and Messrs. Morgan, Grenfell & Company at a conference on 25 January, 1915,[2] the conclusions arrived at being summarised in a letter from the War Office to Messrs. Morgan, Grenfell & Company (28 January, 1915) as follows:[3]

(1) A general War Office account, and a separate account for the Remount Commission under Major-General Sir F. W. Benson, K.C.B., will be kept with Messrs. Morgan & Company, New York.

---

[1] See Appendix I.
[2] For a Memorandum of this meeting see Appendix II.
[3] 0153/2039.

(2*a*) By General War Office account is understood that relating to all contracts placed and payments made by J. P. Morgan & Company in their capacity as commercial agents.

(2*b*) This account will be kept in funds by telegraphic transfer against sums placed to your credit at the Bank of England by this Department. Money will be remitted from time to time upon notification from the commercial agents of their anticipated requirements.

(2*c*) A statement of account will be furnished monthly by the commercial agents to this Department accompanied by all paid bills and other vouchers, supporting transactions in the account.

(3) The Remount Commission account will be placed in funds as necessary at the instance of this Department, in the same manner as the general War Office account.

(4) Remittances to both accounts will be sent by you at the most favourable rate of exchange obtainable, and no commission will be charged.

(5) The question of the rate of interest to be allowed on balances in the general account to be subsequently discussed.

(6) Contracts made by the commercial agents on behalf of the Admiralty will be financed out of the general War Office account and included in the monthly statement rendered to this Department.

Messrs. Morgan, Grenfell, replying on 29 January, 1915, stated that the points detailed in the letter from the Army Council were in accordance with their understanding of the arrangements agreed upon at the meeting, with certain exceptions. Messrs. Grenfell thought it desirable that transfers of funds to New York be made either by telegraphic transfers or demand drafts at the discretion of Messrs. J. P. Morgan & Company, "with a view to avoiding dislocation of the exchanges and arranging the matter in the best interests of the Government."

With reference to paragraph (4), Messrs. Morgan, Grenfell & Company agreed that remittances for the general War Office account should be made at the best exchange obtainable, without charge by Messrs. J. P. Morgan & Company, but they had understood that the question of remittances for the Remount Commission account was to be left over for subsequent discussion. If the sums transferred for this account were not large in proportion to the whole amount of transfers it was understood that Messrs. Morgan should make no charge, but if, on the other hand, the transfers for the Remount Commission were large in proportion to the whole transfers, Messrs. J. P. Morgan were to receive remuneration on a basis mutually satisfactory to themselves, the Army Council, and the Treasury.

These modifications appeared reasonable to the Army Council,[1] and the concurrence of the Treasury was notified to the War Office on 12 February, 1915.[2] On 15 February, therefore, the Army Council informed Messrs. Morgan, Grenfell that the modifications proposed in their letter were accepted.[3] The concurrence of the Admiralty in these arrangements was invited, on the basis that any payment made out of the general War Office account in respect of Admiralty contracts was to be subsequently adjusted as between the Admiralty and the War Office.[4]

II. Proposed Reduction of the Commission.

When the agreement of 15 January, 1915, was signed, the view of the Army Council was that the bulk of the large munition orders for America had already been placed, and it was not anticipated that the value of the contracts still to be placed would exceed £10,000,000. The extent of the orders for munitions of war, however, exceeded all expectations, and by the middle of May already amounted to over £60,000,000. This involved the payment of commissions to Messrs. Morgan of more than £600,000. The responsible authorities, realising the importance of the question, attempted to bring about a modification of the terms of the agreement so as to reduce the scale of the remuneration to which the firm would be entitled in respect of future orders.

On 12 May, 1915, Sir George Gibb, in an interview with Mr. F. C. Whigham,[5] representing Messrs. Morgan, Grenfell & Company, suggested that the latter should submit to Messrs. J. P. Morgan the question whether the terms of their remuneration, as regards further orders, might not be re-adjusted, either by making the commission reducible on a sliding scale, or by in some way limiting the maximum commission payable to the firm. Sir George Gibb stated that he did not question for a moment the value of Messrs. Morgan's services, the efficiency with which the work had been done, or the large savings made for the Government, but that he was at the same time of the opinion that, however great the services, there was a limit to the amount of commission that should be paid to any one firm. Further, with reference to the enormous amount of work done by Messrs. Morgan under high pressure, Sir George Gibb pointed out that this fell mostly upon the Stettinius purchasing organisation, the cost of which had been charged to the Government.

Mr. Whigham, putting forward Messrs. J. P. Morgan's point of view, stated that the partners in Messrs. Morgan, Grenfell and Messrs. J. P. Morgan & Company felt that the services rendered and the

---

[1] Letter to Treasury, 3 February, 0153/2039.
[2] Letter to War Office, 3438/15 placed in 0153/2039.
[3] 0153/2039.
[4] Letter from War Office to Admiralty, 28 January, 0153/2039.
[5] 0153/2149.

amount of work and responsibility involved had exceeded anything that had been anticipated. In addition to purchasing, Messrs. J. P. Morgan had been called upon to organise plans for shipping arrangements, inspection, etc., and had just been asked to arrange an organisation for checking the entire deliveries under the contracts, all these being services never contemplated under the original plan and involving great responsibility. Further, owing to the great pressure upon the War Office officials, it had been found impossible to carry on the business in a regular way by correspondence, and all instructions were given verbally, which involved great responsibility and constant attendance of the partners of Messrs. Morgan Grenfell. The amount and rapidity of the work done by Messrs. J. P. Morgan in America was enormous, and the services rendered could only be given by a firm with a very large organisation, and very large capital, and these facts had to be taken into account in considering the remuneration. In pointing out the savings to the Government which had been effected, Mr. Whigham mentioned that the Government was still in many cases contracting through firms who were not making 1 or 2 per cent. on the contracts, but 5, 10, and 15 per cent.

A few days later, in a meeting between Mr. Wintour and Mr. Whigham, the matter was again discussed. Mr. Wintour followed Sir George Gibb in stating that the matter could not reasonably remain on the basis of a fixed percentage. The real question was not one of percentage but of the amount of money Messrs. Morgan were to receive for their services. The contracts would soon amount to £100,000,000, which would mean a commission of £1,000,000 sterling, while it was quite possible they would reach much larger figures. The question which Government officials would have to support and defend was the amount paid to Messrs. J. P. Morgan, and not merely the rate of commission. He did not question the benefits to the Government arising out of the commercial agency arrangements, and he fully admitted the work and responsibility involved, but he pointed out that the work fell largely on the buying organisation, which was already paid for by the Government, and that while the responsibility was no doubt considerable, Messrs. Morgan had no financial commitment in the matter.

As to the buying organisation, the cost of which was entirely charged to the Government, he had not supposed when the contract was originally framed that a buying organisation would handle all the orders placed through Messrs. Morgan, but had supposed that the firm would, in most cases, handle the business themselves, merely using a buying organisation in particular cases. He was quite willing to accept the position that the employment of such an organisation was the best means of carrying on the work, but it involved considerable expense to the Government—an advance of $240,000 had been charged in the March account—and relieved Messrs. J. P. Morgan of a vast amount of work.

Mr. Wintour then gave certain information as to cases in which English brokers had agreed to a re-adjustment of terms. The commission payable to a firm which purchased oats for the army had been

fixed at 1½ per cent., but when it was found that the purchases amounted to over £5,000,000, giving a commission of about £75,000, the War Office took up the matter with the firm, who voluntarily suggested reducing the commission from £75,000 to £46,000, and made a new arrangement at a very much reduced commission with a maximum of £10,000 per annum. A similar revision of terms was voluntarily made by the firm which purchased bacon for the army. In the case of the contract with the Canadian Pacific Company for purchases in Canada, the commission payable was 1 per cent on the first £10,000,000 and ½ per cent. thereafter, no charge being made to the Government for buying organisation expenses. Though a large British corporation might be expected, for sentimental reasons, to work on minimum terms, which were lower than could be expected from an American firm, he thought the terms of the arrangement with the Canadian Pacific Company had some bearing on the case.

On 18 May, 1915,[1] Messrs. Morgan, Grenfell & Company sent a full report of these interviews to Messrs. J. P. Morgan & Company. It was pointed out in the letter that no detailed suggestion had been made by Sir George Gibb or Mr. Wintour as to what shape the proposed revision of terms should take, or at what point the reduction should be made, nor whether it should be made by fixing a maximum commission for any period, or by a sliding scale of commission. There was no desire on the part of the War Office to be "unduly grasping," and it was hoped that Messrs. J. P. Morgan would consider the whole question in a friendly spirit and themselves make some suggestion.

Four months later, when Mr. D. A. Thomas undertook his mission to Canada and the United States, he was asked to discuss with Messrs. J. P. Morgan the question of a reduction of their commission. At Mr. Davison's request the matter was postponed until Mr. Thomas should have had time to form an opinion of the nature and extent of Messrs. Morgan's organisation. In a cable of 3 October,[2] and in his later report, Mr. Thomas stated that he considered the commission too high considering the magnitude of the orders and the value of the agency to Messrs. Morgan's prestige:—

> "In my opinion, their commission of 2 per cent. on the first £10,000,000 worth of goods ordered, and 1 per cent. on the remainder, while reasonable in itself in the first instance, has become excessive in consequence of the enormous growth of the munitions business. I question, moreover, whether in a transaction of this kind the principle of paying a commission on the value of goods ordered is sound, and whether it would not have been better policy to arrange a fixed remuneration."

At the same time, it was possible that the firm, if not hampered by the agency, might have made more profit from dealings in munitions of war. Mr. Thomas stated that he had been strongly advised by the British Ambassador on his arrival not to raise the question. He questioned the policy of bringing up the matter at a time when the

---

[1] 0153/2149. [2] *Ibid.*

Ministry had no effectual lever for obtaining concessions, as the attempt might only impair the friendly relations then existing and involve the risk of Messrs. Morgan's withdrawal from the agency. In a letter of the same date[1] Mr. Thomas amplified this opinion by stating that, owing to the part which Messrs. Morgan had played in the Anglo-French loan negotiations, and to the rather delicate situation created by the action of the Ministry of Munitions in dealing direct with the Bethlehem Steel Company in connection with the orders for guns then being negotiated, it was an inopportune moment for endeavouring to get the commission reduced. The efficient buying arrangements organised by Mr. Stettinius, of whose ability he had formed a high opinion, had effected savings to the British Government far out of proportion to the commission paid. He thought the situation had been altered to some extent by the spontaneous offer of Messrs. Morgan to relieve the British Government of the entire cost of the buying agency.[2]

Mr. Wintour dissented from Mr. Thomas' view, having regard to the fact that existing schemes for co-ordinating the purchases of the Allies might lead to a large extension of Messrs. Morgan's work. On his suggestion, an estimate of the value of the orders placed through Messrs. Morgan, was prepared on 22 October,[3] from which it appeared that orders amounting to £181,328,000 had been placed on behalf of Great Britain and the Allied Governments. Russian orders not yet placed were estimated at £21,000,000, bringing the total up to £202,328,000. The following table shows the distribution of these orders :

ESTIMATE OF ORDERS PLACED THROUGH MESSRS. MORGAN UP TO 22 OCTOBER, 1915.

	£	£
British Government.		
Munitions Department		102,000,000
War Department		
F5	1,077,000	
QMG F6	1,795,000	
QMG Fa	46,000	
W.F.	30,000	
		2,948,000
Admiralty		2,000,000
Total British Government		£106,948,000
Allied Governments.		
Russia (orders placed or practically placed)		72,000,000
Serbia		2,380,000
Total Allied Governments		£74,380,000
TOTAL		£181,328,000
Russia (orders not yet placed)		21,000,000
PROBABLE GRAND TOTAL		£202,328,000

[1] 0153/2149.

[2] Sir C. Harris took the view (3 November) that this offer was not spontaneous. He had challenged the charge for the buying organisation in Messrs. Morgan's accounts and they had withdrawn it.

[3] 0153/2149.

On 9 November, 1915, the whole question of the rate of Messrs. Morgan's commission was referred to the Prime Minister, who advised that it should be left in abeyance until it had been considered by the Cabinet. No decision was reached,[1] and the matter was allowed to drop. Later (24 October, 1916), the Treasury stated, in reply to a letter from Sir Charles Harris, that the Government did not intend to re-open the question at present, nor were they likely to do so within any period which could be foreseen.[2] In April, 1917, when the commission on orders placed by the British Government on its own behalf or for its Allies approximated to £4,000,000, the Minister of Munitions wrote to the Chancellor of the Exchequer suggesting revision, but Mr Bonar Law replied (27 April) that he did not desire to disturb the financial relations with Messrs. Morgan in view of the improbability at that date of effecting any economy.[3]

III. Stage at which the Commission became Payable.

Up to the end of August, 1915, the commission charged by Messrs. Morgan amounted to £1,609,270. In regard to certain charges under this head the question was raised at what stage of the transaction the commission was payable. Messrs. Morgan's practice was to claim the full commission as soon as the contract was signed, but the Director of Financial Services considered that this claim was not in accordance with the terms of the agreement.[4]

In March, 1916, the point as to when the commission on each contract became due was settled by the Chancellor of the Exchequer in Messrs. Morgan's favour, it being understood that all commissions were to be charged on the amount of the contract at the time the contracts were signed, or as soon after as the amount was ascertainable. At the same time, Messrs. J. P. Morgan agreed to assume all the expenses of their buying organisation themselves, instead of charging them to the Government.

The arrangement arrived at was recorded in the following letter from Mr. J. P. Morgan to Mr. McKenna, dated 8 March, 1916 :—

> "As arranged with you last evening, I hand you herewith my understanding of the results of our conversation of yesterday at the Treasury. If you agree to my statement of them and will confirm it, this letter and your confirmation will become the interpretation of the Contract on the questions settled.
>
> First, it was agreed that the practice established should be continued and confirmed in regard to the matter of charging commissions. All such commissions are to be charged on the amount of the contracts at the time the contracts are signed, or as soon thereafter as the amount is ascertainable. In cases, however, where a contract is abandoned by a contractor without

---

[1] 0153/2149.
[2] *Ibid.*
[3] M.F./Gen./1486.
[4] 0153/2149.

any deliveries having been made, Messrs. J. P. Morgan & Company are to return the commission charged. Where a contract is cancelled, however, by the action of His Majesty's Government, the commission is to be retained by us.

The question of commission on renewal and repeat orders was further discussed, and it was finally agreed that the commission should be chargeable on all such orders, but that Messrs. J. P. Morgan & Company would continue to serve as agents for the Government in negotiating the details and operation of cancellations, where the Government desired them to do so, without making any charge for their services in that connection, it being understood, of course, that should there be, in the process of such cancellations, expenses from litigation or arbitrations, such expenses should be for account of the Government.

I confirm to you that Messrs. J. P. Morgan & Company had found it necessary, in order to secure the services of people most competent to carry out the operations entrusted to them, to pay salaries on an exceptional scale. That, in order to avoid any questions on such a point, they decided to assume all the expenses of their organisation themselves, instead of collecting such expenses from the Government under clauses 6 and 7 of the Contract of 15 January, 1915. I stated, merely for your information, that these expenses had already exceeded £200,000, and that we expected that they would, in the future, not be less than £100,000 a year."

The Chancellor of the Exchequer replied on 8 March, 1916, concurring in Mr. Morgan's statement, and the War Office and the Ministry of Munitions were informed by the Treasury of the Chancellor of the Exchequer's decision on 24 March, 1916.[1]

On 11 September, 1916, the Admiralty asked the Army Council what interpretation it placed on the question at what stage of the transactions the payment of Messrs. Morgan's commission was due,[2] and was informed in reply (3 October, 1916) of the Chancellor of the Exchequer's decision of 8 March.[3]

IV. Payments on Orders not Placed through Messrs. Morgan.

In the same letter of 24 March, 1916, the Treasury asked for information as to the procedure followed when requesting Messrs. Morgan & Company to make payments from the Commercial Agency Account in respect of orders placed otherwise than through Messrs. Morgan. The Treasury was notified in some cases before transfer was requested, but wished for information as to whether Messrs. Morgan were ever requested to make such payments without application to the Treasury.

---

[1] Appendix III.
[2] I.C. 6917/53178 in file 0153/2448.
[3] 0153/2445.

The War Office stated in reply (1 May, 1916)[1] that in certain cases —which were not numerous—the practice of the War Office was to pass a copy of the contract to Messrs. Morgan, together with such details of the contract as would enable them to pay. These cases were confined to orders for tractors and parts with the Holt Manufacturing Company, for oats purchased in the United States by Messrs. Bovill, and for hay shipped from Galveston and New York.

Shortly afterwards, Messrs. J. P. Morgan undertook to make payments for orders not placed through them gratuitously, provided they were fully indemnified against the consequence of any mistakes. The Treasury informed the War Office of this arrangement on 14 June,[2] stating that the fullest precautions must be taken to prevent any possibility of misapprehension by Messrs. Morgan when making payments. Messrs. Morgan had recently demurred to making payments on contracts not concluded through their agency, unless on direction by the Treasury. The Treasury thought it undesirable that it should be concerned in the matter, as it was not responsible for, or acquainted with, the terms of the contracts. It suggested that, as a precaution, directions to make payments should be given through one or two specified officials only, and on 24 June asked that the names of these officials should be notified to the Treasury as soon as possible.[3] On 11 July the Treasury stated that Messrs. Morgan, Grenfell had been informed of this arrangement.[4] The Treasury requested that in future any proposed contract where the payment exceeded £50,000 should be submitted to them for their observations, in view of the exchange position.

The Commercial Agency Agreement remained in operation until the summer of 1917, when Messrs. J. P. Morgan, at their own request and as a result of the entry of America into the war, were relieved of their appointment as purchasing agents for the British Government.[5] After negotiations conducted by Sir Hardman Lever, it was arranged that the firm's commission on all contracts placed after 1 June, 1917, should be reduced to $\frac{1}{2}$ per cent. After the British War Mission took over the work of placing contracts, in September, 1917, Messrs. J. P. Morgan acted as financial agents only, making payments on these contracts and charging a commission of one-eighth of one per cent.[6] The way in which the agreement actually worked in practice will be dealt with in the following chapter, which covers the first six months of its operation, before the establishment of the Ministry of Munitions and the development of an American Branch of that Department relieved the commercial agents of much of their responsibility for the purchase of munitions in the United States.

---

[1] 0153/2371.

[2] 15546/16 in 0153/2371.

[3] On 3 July the War Office nominated Mr. W. P. Perry, Director of Financial Services, and Mr. J. M. Bull, principal clerk. (0153/2421.)

[4] 17605/16 in 0153/2428.

[5] See below, p. 61.

[6] M.F./Gen./1486. The approximate value of the contracts placed by Messrs. Morgan throughout the war is shown in Appendix IV.

CHAPTER III.

THE WORKING OF THE COMMERCIAL AGENCY AGREEMENT, JANUARY TO JUNE, 1915.

I. The Placing of Orders.

(*a*) Messrs. Morgan's Relations with Firms.

A considerable part of the work done by Messrs. Morgan was straightforward and involved no particular difficulty. The following account of the normal procedure was given by the Director of Army Contracts :—

> "Communication with the firm in New York is carried on through their London House, Messrs. Morgan, Grenfell & Company. Mr. C. F. Whigham of the latter firm keeps in close personal touch with the officials of the Contracts Department and business is mainly conducted by verbal instructions discussed with him and then communicated by cable to New York. On the other side Messrs. Morgans have organised a separate department, under Mr. E. R. Stettinius, President of the Diamond Match Company, with a staff specially qualified for dealing with the purchase of various classes of war material ; on technical points demanding knowledge of military requirements assistance is obtained from the inspecting officers sent over by the War Office. Though there were necessarily some initial difficulties this machinery has worked smoothly almost from the start."

Copies of the cables on both sides were transmitted day by day to the War Office.[1] The contracts were drafted according to a form sent out by the War Office on 15 January,[2] were signed by Messrs. J. P. Morgan & Company, "for and on behalf of His Britannic Majesty's Government."[3] A list of the contracts made before the establishment of the agency was sent to Messrs. Morgan on 22 January[4] in accordance with Clause 9 of the agreement.

---

[1] Cable No. 2950 from Messrs. Morgan, Grenfell to Messrs. J. P. Morgan. These cables are referred to throughout by prefixing the letter L. to the cable number. Cables from Messrs. J. P. Morgan to Messrs. Morgan, Grenfell are distinguished by prefixing the letters N.Y. (A complete set of the cables is filed in the Archives Registry.)

[2] N.Y. 1255.

[3] L.1086.

[4] L.2100.

In placing orders for the War Office Messrs. Morgan had to discriminate between a vast number of firms and individuals whose terms as to prices and delivery became attractive in proportion to their lack of experience and capacity. Messrs. Morgan summarised the position in a cable of 5 March, 1915[1]:—

> "In the present emergency great numbers of people are proposing to engage in the production of articles of which they have no knowledge, and in most of such cases we have found that they rely on the Government to supply practically all the funds required for the construction of plant and working capital, the impression being general that the Government is prepared to make large advance payments in connection with any contract that may be closed."

Messrs. Morgan's policy was to deal only with companies of acknowledged reputation and position, whose technical experience had been thoroughly demonstrated.[2] In many cases this meant accepting a proposal less attractive with regard to price and promised delivery, but Messrs. Morgan pointed out again and again that small companies were likely to be much more liberal in their promises than their performances, and many of them were physically and financially incapable of handling large contracts.[3] On the whole, the War Office accepted this advice: for example, in the case of offers to produce rifles it came early to the conclusion that the results of dealing with small companies would not be proportionate to the trouble involved in investigating plants and inspecting output at different points.[4]

When offers from different firms coincided or varied little from each other the agents made recommendations based on the financial standing of the companies, their technical experience, geographical situation, and so on.[5] The firms whose tenders had been refused made constant complaints to the War Office that their proposals had not been seriously considered.[6] Warned by their London agents of allegations of this kind, Messrs. Morgan usually cabled a full account of their reasons for refusing to consider the offer seriously.[7] The War Office expressed its appreciation of their attitude,[8] and the matter was dropped. In a few instances, however, firms or brokers succeeded in persuading the War Office that their claims had not received sufficient consideration, and the Director of Army Contracts asked Messrs. Morgan to explain.[9]

The most serious case of the kind was that of a broker who complained that his principals did not get proper opportunities for obtaining

---

[1] N.Y.1380.
[2] N.Y.1177, 1380.
[3] *e.g.* N.Y. 1006, The New York Blasting Company.
[4] 9 February, L. 2190.
[5] *e.g.*, L. 1023, 1024, 1046, 1079, N.Y. 1022, 1026, 1035, 1062.
[6] L. 2254, 2383, 2384, 2269.
[7] N.Y. 1377, 1380, 1246, 1253, 3721.
[8] L. 2391, L. 2269.
[9] L. 2383, 2384.

orders. Sir George Gibb requested Messrs. Morgan to explain this.[1] In reply Messrs. Morgan reported that the individual in question was "ill-balanced and utterly unworthy of confidence, always mixing in tangles and most undependable." Though they did not believe him to be "crooked at heart the results amounted practically to the same,"[2] and the president of an important munitions firm subsequently stated that the broker had no authority to represent them, and that they preferred to deal direct with Messrs. Morgan.[3]

The War Office negotiations with a firm which offered to make shells illustrate another kind of difficulty. Messrs. Morgan had reported on 22 February that the company was "a comparatively unknown concern," and that reports concerning its financial situation were unfavourable.[4] The War Office communicated the substance of this report to the company who strongly remonstrated with Messrs. Morgan.[5] Messrs. Morgan urged that such reports should be treated as confidential, and stated that they would expect the British Government to indemnify them against claims for damages (24 February). The War Office regretted the embarrassment to their agents, and informed Messrs. Morgan that its statements had in no way justified what the company had said.[6] The matter was subsequently adjusted in an interview between Messrs. Morgan, Grenfell and the company's representative,[7] and, on a more favourable report from Messrs. Morgan,[8] the company received an order for 4·5in. shells (5 March).[9] There is evidence that Messrs. Morgan thought the negotiations with this firm might prejudice a larger scheme for supply from the Washington Steel and Ordnance Company, then under consideration.[10]

Throughout the early months of 1915 serious difficulties were caused by the activities of brokers. There were "innumerable middlemen—reliable and unreliable—endeavouring by obtaining options upon this or that output to secure contracts with the British or Allied Governments."[11] Their activities kept the markets for raw materials, such as high grade zinc, cupro-nickel, and other special metals, and for machine tools in a state of ferment. As Messrs. Morgan pointed out, it became "extremely difficult to place contracts upon anything like reasonable terms, and what was even more important, there was always the danger of their interfering with existing contracts."[12]

From the beginning, the commercial agents urged that brokers should be eliminated in the interests of the British Government.[13]

It was their business, they said, "to purchase for the British Government as if for themselves,"[14] and it was obviously to the advantage of the Government to cut out middlemen's commissions and

---

[1] L. 2434, 2457.
[2] N.Y. 1438.
[3] N.Y. 1454.
[4] N.Y. 1275.
[5] N.Y. 1291.
[6] L. 2317.
[7] L. 2326.
[8] N.Y. 1352.
[9] L. 2371.
[10] L. 2299.
[11] Letter from Messrs. Morgan, Grenfell to the War Office, 11 May, 1915.
[12] *Ibid.*
[13] *e.g.*, L. 2130, N.Y. 1207.
[14] N.Y. 1454.

deal directly with the manufacturers. As the process continued they expected that " continued squealings of middlemen would be heard," but they hoped that the authorities would approve of their methods.[1]

In spite of this, many large firms continued the practice of approaching the War Office through their own brokers, negotiating with Messrs. Morgan at the same time and playing off one against the other. For example, one ammunition-making firm, whose relations with Messrs. Morgan were excellent, were unknown to them employing a broker as late as 16 April to offer the same supply of Mark VII small arms ammunition direct to the War Office.[2] When this was discovered the company defended themselves from the charge of bad faith as the price they had quoted had been the same in both cases. They thought the employment of a separate broker increased their chances, as he was " evidently next to some one in London who could deliver business."[3] The War Office, however, decided to decline the broker's offer and leave the field clear for their agents' direct negotiations.[4] The fact that in most cases Messrs. Morgan were already in touch with the manufacturers whose offers these brokers submitted made their activities unnecessary where they were not mischievous.

Some of these brokers were men of straw, and many were repudiated by the firms they professed to represent.[5] One broker refused to furnish either the name of his principal or the price at which he was prepared to negotiate, on the plea that " such information could be used against other manufacturers, or to educate Messrs. Morgan, or to serve as valuable information for the British Government Secret Service." The War Office, however, resisted proposals of this character.[6]

Other brokers made large and attractive promises of rapid and speedy delivery which led to many fruitless negotiations.[7] An illustration of this is the story of the pursuit of the Krag rifles, which ended in the discovery that the broker was trying to get hold of rifles belonging to the United States Government.[8] An order given in January to a firm of brokers for any rifles they could produce by December, 1915, led to endless difficulties and to remonstrances from Messrs. Morgan, from the War Office inspectors, and from responsible rifle manufacturers.[9] Other agents, though more reputable, were not more

---

[1] N.Y. 1448, 3540.
[2] L. 2894, N.Y. 1940, L. 4048.
[3] N.Y. 3076.
[4] 16 April, L. 2894.
[5] L. 2211, N.Y. 1253.
[6] 23 March–9 April, N.Y. 1552, L.2570, N.Y. 1560. L. 2579, N.Y. 1606, L. 2785.
[7] *e.g.*, Offer of picric, L.1008; of guncotton, L. 1013; of toluol, L. 2108, 2114, N.Y. 1111.
[8] L. 1021, N.Y. 1013, L. 1030, N.Y. 1019, 1028, N.Y. 1058, L. 2295, 14 January–22 February.
[9] N.Y. 3013, L. 2993, N.Y. 3034, L. 4022, N.Y. 3237, L. 4248, N.Y. 3264, 3316. See also Messrs. Morgan's cable of 17 June, N.Y. 3855, and the War Office minute on it.

reliable, and the difficulty continued for months after Messrs. Morgan's appointment. The excitement in New York over war orders became so intense that commission hunting from the British Government attracted a horde of sanguine speculators, who continued, as Messrs. Morgan complained, to " bombard the War Office with reports that they can deliver if allowed to deal with some one other than ourselves."[1]

It occasionally happened that the War Office preferred to place orders through brokers they had previously employed,[2] and Clause 14 of the agreement expressly reserved to the Government the right of making purchases otherwise than through the Commercial Agents, " if in the opinion of the Army Council or the Admiralty there is good and sufficient reason for so doing." Messrs. Morgan protested strongly against action of this kind, and the Director of Army Contracts gave instructions (11 February, 1915) that no orders were to be placed except through Messrs. Morgan without his express authority.[3] Another difficulty arose from the fact that brokers who had previously had satisfactory relations with the War Office naturally resented Messrs. Morgan's appointment, and made strenuous efforts to retain their position. Messrs. Morgan, admonished to handle tactfully firms who had hitherto been dealing with the British Government,[4] replied that they " would have every consideration for the past relations of all these people."[5] Though, in many cases, a bitter feeling remained, there is no evidence that any firm persisted in its refusal to negotiate through the Commercial Agents,[6] and in a later report on the subject, Mr. D. A. Thomas stated that he had not found a single responsible firm who had substantial reasons for declining to deal with Morgans. " In the vast majority of cases, if not all, the ground for reluctance to negotiate with Messrs. Morgan was the knowledge that broker's commissions would be eliminated."

In a few cases Messrs. Morgan acquiesced in the employment of brokers by the British Government. At first they thought it better for orders for fuzes to be placed through Messrs. Vickers, owing to the experimental character of the industry in the United States,[7] though later on they undertook the work themselves.[8] In the same way Messrs. Nobel and Messrs. Tennant were employed jointly with Messrs. Morgan in certain acetone negotiations,[9] and Messrs. Nobel took charge of certain purchases of explosives for the Government.[10]

---

[1] N.Y. 1058.
[2] *e.g.*, 9 February, L. 2197.
[3] L. 2222, N.Y. 1193.
[4] L. 1017.
[5] N.Y. 1009.
[6] L. 1014, N.Y. 1009.
[7] N.Y. 1116, L. 1067.
[8] N.Y. 1138, L. 1177, N.Y. 1400, L. 2406.
[9] L. 2489, 2587, 2606, N.Y. 1586, L. 2693, N.Y. 1819, 1920, 1925, L. 2947.
[10] N.Y. 1135, L. 2155, L. 2693.

(*b*) Repeat Orders.

The interpretation of the agreement with regard to repeat orders led to some difficulty. Under Clause 15 repeat orders not involving negotiations were excluded from the operation of the agreement, but the Government undertook to inform Messrs. Morgan as far as possible of the orders placed. Messrs. Morgan took the view that they were entitled to be informed before the repeat orders were placed,[1] and further that it was desirable that repeat orders should go through them, even if no commission was charged, as experience showed them the advantage of the centralization of orders. On 11 February they urged that better terms could be secured for the Government if they conducted the negotiations, since the trade was settling down to the position that offers to and dealings with the British Government should only be made through them, and the negotiation of even repeat orders through other agents had a disturbing effect.[2]

The War Office proposal to place repeat orders for small arms ammunition with the manufacturing companies direct (10 March) was resisted by Messrs. Morgan, on the ground that it was not in harmony with the agreement,[3] but Messrs. Morgan, Grenfell advised them that, in view of sections 14 and 15 of the agreement, the War Office was quite entitled to take the course it did.[4] They reported that the War Office would agree to Messrs. Morgan charging their commission if they were able to suggest new sources of supply or obtain more favourable terms from the two companies. If, on the other hand, Messrs. Morgan confirmed the War Office view that there was only one possible course—to place extension orders with the two companies—which would involve no considerable amount of negotiation, their commission would be a matter of mutual arrangement. Messrs. Morgan, Grenfell reminded Messrs. Morgan that it was very necessary to have some give and take as regards carrying out the spirit of the agreement, since the whole success of the agency depended on the continuance of the very friendly relations established with the contract officials at the War Office. They pointed out, further, that as the orders already placed or in sight amounted to £10,000,000, the commission chargeable on this transaction would in any case be only 1 per cent.

The Commercial Agents, convinced by these arguments, cabled on 15 March that they were in thorough harmony with the spirit displayed by their London representatives, and deeply regretted having added to their burdens.[5] By June the custom of negotiating repeat orders through Messrs. Morgan was fairly established.[6]

---

[1] N.Y. 1193.
[2] L. 2197, N.Y. 1179, L. 2222, N.Y. 1193.
[3] L. 2436, N.Y. 1448.
[4] 12 March, L. 2460.
[5] N.Y. 1475.
[6] *e.g.*, L. 4285.

(c) Direct Negotiations in London.

In certain cases direct negotiations were carried on in London between the War Office and representatives of firms in the United States. Powerful corporations, like the Bethlehem Steel Company and the United States Cartridge Company had technical experts as well as business representatives in London, and the War Office found it a great advantage to negotiate on technical points directly with them instead of having to instruct Messrs. Morgan to consult the War Office inspectors in the United States.[1] When the War Office accepted tenders made in this way,[2] the contracts were forwarded to Messrs. Morgan to be signed by them as agents for the British Government, and commission was paid to them in the usual way.[3] Messrs. Morgan had therefore no financial or legal grievance,[4] but they took the strongest possible objection to these negotiations, and from the business point of view their hostility was not unreasonable.[5] There were one or two striking cases in which the War Office bought munitions at a higher price than that at which they had been offered to Messrs. Morgan by firms of equal standing. Thus, on 27 April, Messrs. Morgan made strong representations on the fact that the War Office had bought 60 pdr. shells at $21, and 15 in. H.E. shells (for the Admiralty) at $380 from one firm, whereas other companies of equal standing had offered to supply them at $16·50 and $300.[6]

As the agents pointed out, these transactions discouraged their endeavours to serve the British Government, and impaired their ability to negotiate. If it were generally known that American manufacturers could secure better prices by negotiating direct through their London representatives they would of course be unwilling to negotiate through Messrs. J. P. Morgan & Company.[7]

The large gun orders placed in America in June were negotiated in London. This gravely prejudiced Messrs. Morgan's position, involving a risk of their withdrawal from the agency, and Mr. D. A. Thomas reported strongly against any dealing with American agents in London.

(d) Admiralty Orders.

Clause 13 of the agreement expressly stated that the Admiralty were prepared to place orders through the Commercial Agents only in so far as it could be done "without undue interference with their established channels of supply," and the bulk of their orders, at all events up to June, 1915, were not placed through Messrs. Morgan.

---

[1] *e.g.*, L. 2193.
[2] L. 1046.
[3] L. 2905, L. 4073.
[4] See Clause 14 of the Agreement.
[5] L. 2434, 2436, N.Y. 1467.
[6] N.Y. 3073.
[7] N.Y. 3073, L. 4069. See also letter from Messrs. Morgan, Grenfell to the Director of Army Contracts, 11 May.

The Commercial Agents were inclined to resent this independent action by the Admiralty, and in cables to their London representatives insisted on the practical disadvantages of important contracts being placed without consultation with them, and on the disturbance to the market caused by independent enquiries for similar munitions.[1] On the other hand, Messrs. Morgan rendered considerable services in connection with Admiralty orders not placed through them, in addition to making payments on such orders, and constantly transmitted information from Sir Trevor Dawson to the Admiralty.[2]

II. Investigation of Market Conditions.

The effect of the sudden demand for munitions of war was reflected in rapidly changing conditions in the American market, and an important part of the work of the Commercial Agents consisted in their efforts to place the large orders entrusted to them in such a way as to minimise the inevitable rise of prices and prevent speculative efforts to " corner " indispensable materials.

From their general reports on market conditions, and from the character of the advice they tendered to the British Government, it is clear that Messrs. Morgan thought that the rapid rise of prices and the excited state of the markets (already apparent when they took up the agency), was partly due to preventable causes. Of these the chief were the unauthorised activities of brokers, and the competition of the belligerent Governments with one another. The schemes for joint purchasing by the Allied Governments will be considered below.[3]

In addition to their general reports on market conditions, Messrs. Morgan frequently investigated the possibility of obtaining supplies of specific munitions in response to definite requests from the War Office. Thus, on 6 January, the agents were asked to report on the supplies of T.N.T. available in the United States, beyond that required by contracts already placed.[4] On 15 January a similar report with regard to the supply of gun-cotton and nitro-cellulose powder during the next few months was asked for,[5] and on 15 February the result of an investigation by Mr. Stettinius into the sources of supply of rifles outside the Remington and Winchester Companies was forwarded.[6]

---

[1] N.Y. 1266, L. 2327, N.Y. 1389, L. 2387, N.Y. 3073, L. 4073, 4506. Sir Trevor Dawson, who had been sent out to represent the Admiralty in March, had dealings with a large rifle-making Company on his own account, thereby raising the price against the War Office, who were negotiating for the same output through Messrs. Morgan. The Admiralty, however, had " no reason to believe there had been any failure in his co-operation with Messrs. Morgan." 4 May, 1915. (94/Gen./44.)

[2] *e.g.*, N.Y. 1582, 3117.

[3] See below, p. 37.

[4] L. 1002.

[5] L. 1023.

[6] N.Y. 1209.

Messrs. Morgan's reports at different dates, from 17 March onwards, on the acetone situation as it developed and the requirements of the War Office became more pressing, are an excellent illustration of the way in which the agents handled a very difficult situation.[1] The utmost caution was necessary owing to the fact that the production of acetate of lime was almost entirely controlled by a ring or group of capitalists, and in May the situation was complicated by the fact that contractors who had accepted contracts for acetone at a low price repudiated their contracts owing to the increased cost of raw materials.[2]

Messrs. Morgan supplemented these reports on market conditions by warning the War Office when there were indications that the market was going to advance and urging them to look ahead as far as possible and forward estimates of their probable requirements, in order that orders might be placed, comparatively speaking, at leisure and on favourable terms. Thus, on 28 January, 1915, the War Office was asked to cable its requirements as to shells, stating the sizes, quantities, and deliveries.[3] The replies gave the required information,[4] and the War Office asked that a scheme for shell production might be worked out as quickly as possible.[5] Another general investigation of the position with regard to the supply of rifles, machine guns and shells was asked for by Mr. Lloyd George on 7 June,[6] Messrs. Morgan being instructed to forward their general views without disturbing the market by enquiries.

Again, on 15 February, Messrs. Morgan had asked for an estimate of the War Office requirements for small arms ammunition, pointing out that the larger manufacturers had already sold their 1915 deliveries.[7]

The value of this kind of advice is illustrated by the result of neglecting it. On 14 January Messrs. Morgan reported that the market was practically bare of high-grade zinc and spelter, and that the production for the next four months had been bought up.[8] The War Office took no action until 26 May, when they made urgent enquiries for spelter.[9] It was then only obtainable at 27 cents a pound, the market having been demoralised by unauthorised enquiries on behalf of Russia.[10]

The Commercial Agents showed equal foresight over the machine tool situation, obtaining authority to purchase lathes to the value of $1,000,000 on 1 March,[11] and later acquiring an option on sufficient machine tools to protect an important contract.[12]

When the nature of the case required it, the War Office gave their agents a general authority to buy. On 28 January, for instance, Messrs. Morgan were instructed to buy any offerings of picric acid and T.N.T., for delivery not later than the end of July, at not more

---

[1] L. 2489, 2587, N.Y. 1586, 1920, 1925, 3261, 3447, L. 2693, 2717, 2856, 2947, 4394.
[2] L. 4394.
[3] N.Y. 1061.
[4] L. 1087, 2107, 2137, 2154.
[5] L. 2307.
[6] L. 4678; see also L. 4904.
[7] N.Y. 1211.
[8] N.Y. 1010, 3236, 3755.
[9] L. 4512.
[10] N.Y. 3509, 3511, 3236.
[11] N.Y. 1340, L. 2389, N.Y. 1390, L. 2441.
[12] N.Y. 1467, L. 2638.

than $1 per lb. in each case,[1] but subsequently, on Messrs. Morgan's representations that it was impossible to do anything under these conditions, the stipulations as to price and delivery were modified.[2]

This general authority to buy toluol up to any amount for delivery before the end of 1915[3] led to one of the few misunderstandings of which there is evidence. Two or three days later, the War Office stated that their maximum requirements for 1915 were 100,000 gallons, but Messrs. Morgan had already made an offer for 720,000 gallons.[4]

The War Office met this difficulty by authorising their agents to buy the 720,000 gallons for which they had offered,[5] but reminded them that this authority was for the current negotiations only as it was impossible to give a standing order for such a large amount owing to the development of production in Great Britain which would, it was hoped, give ample supplies in the latter part of the year and obviate the shipping difficulty.[6]

Canada was not included in the sphere of Messrs. Morgan's agency, and the firm anticipated difficulties from the competition of the Canadian Government and Canadian contractors in the United States market.[7] These fears were realised. In April the metal and machinery market was "violently deranged" by purchases by Canadian munition makers,[8] and difficulties also arose from the Russian negotiations with the Ross Rifle Company, as it was feared that sub-contracting by the company in the United States might conflict with Messrs. Morgan's efforts to place rifle contracts for the British Government.

On 15 April Messrs. Morgan were informed that the Canadian Pacific Railway had been appointed Purchasing Agents for war supplies in Canada, and had been asked to co-operate with them with a view to avoiding competition in the United States market. The supply of shells, rifles, etc., was to be dealt with as before by the Canadian Minister of Militia.[9]

Messrs. Morgan urged that the Canadian Pacific Railway should be instructed not to make any enquiries of American manufacturers, and in placing orders with Canadian manufacturers to stipulate that they should be filled in Canada, but their London agents took the view that this would be "a counsel of perfection and that the existing situation would be much improved by the appointment of one responsible corporation."[10] Independent action by the Canadian Shell Committee was still causing difficulties in May, and their proposal to place an order for 3,000,000 fuses with seventeen manufacturers in the United States, which had been made without consulting Messrs. Morgan, was a serious matter, as at least five of the firms approached were already engaged on British Government work.[11]

---

[1] L. 1089.
[2] N.Y. 1075, L. 2129, 2169.
[3] L. 2214, N.Y. 1094, L. 2120, 2169.
[4] N.Y. 1151, L. 2174, N.Y. 1162.
[5] L. 2176.
[6] L. 2189, 2206, N.Y. 1174.
[7] L. 1005.
[8] N.Y. 1817.
[9] L. 2880, N.Y. 1926.
[10] N.Y. 1926, L. 2799, N.Y. 1963.
[11] N.Y. 3454, L. 4545, N.Y. 3551.

III. The Development of New Sources of Supply.

(*a*) Provision of Capital.

Under Clause 2 of the agreement the Commercial Agents undertook "to aid and stimulate by all the means at their disposal sources of supply for the articles required." Many of Messrs. Morgan's schemes for stimulating the supply of essential munitions involved the financing of potential producers by the British Government. The principle of making advance payments to manufacturers had been conceded before Messrs. Morgan were appointed agents. Though the War Office announced on 10 February that it was "strongly averse to advance payments" it was compelled to make them in order to induce manufacturers to undertake the extensions of plant necessary to meet War Office requirements. Sums varying from 25 to 50 per cent. of the price of the goods to be supplied were advanced, and were deducted from the purchase money as it became payable.[1]

One contractor demanded an irrevocable credit or a deposit to cover the money due under a War Office contract. The War Office, owing to the urgency of its need for spelter, finally agreed (29 May) to deposit cash with Messrs. Morgan to cover the amount involved, though naturally reluctant to give way to an unprecedented demand.[2] A request for an advance payment made by an important munitions firm (3 June) in respect of a continuation order, was refused, as the War Office regarded it as "most unreasonable."[3]

As the demand became more pressing and the sources of supply were taken up, the British Government undertook to provide the cost of additional plant and equipment without any provision for the money being deducted from the price of the goods supplied. Thus in March it was proposed that $1,250,000 should be given to a group of shell producers for the purchase of plant and equipment. There was no provision for the return of the money, but the plant was to be at the disposal of the British Government if it wished to place further orders for shell.[4] The War Office agreed to the proposal in principle, but stated that the authority of the Finance Department would be required, since the stipulation for a gratuity towards the cost of the plant had no precedent.[5]

The War Office pointed out on 12 February that the most reasonable price quoted in the United States was largely in excess of the cost of the same article in Great Britain, and if the difference was very large, the Government would prefer to find further capital for the extension of plant in Great Britain.[6] A contract on this scale naturally involved prolonged negotiation, the chief modification in favour of the War Office secured by Messrs. Morgan being that the buyer should have the

---

[1] N.Y. 1027, 1034, 1182, L. 2221, 2122.
[2] L. 4557, N.Y. 3613.
[3] L. 4629, N.Y. 3649.
[4] N.Y. 1339.
[5] 3 March, L. 2373.
[6] L. 2226.

option to cancel deliveries in arrear, and remove such part of the plant and equipment as was not in use, with the exception of fixed plant and equipment, such as furnaces, cranes, buildings, sewers, etc.[1]

The Commercial Agents did useful work in persuading companies which had been successful in producing munitions to extend their plant. Thus, on 11 February, 1915, they approached an important firm and suggested that they should consider the construction of additional plant for the production of rifles. The proposals fell to the ground for the moment, as the firm would not promise to begin delivery from the new plant before eight months had elapsed,[2] but it was taken up again later (6 April), a new company being formed to build a rifle-making plant in Philadelphia.[3] In May the War Office, through Messrs. Morgan, tried to induce this company to set up a new plant in Canada, for which the British Government would find the capital, but the fear of a shortage of skilled labour in Canada prevented the company from accepting this proposition. The War Office, therefore, undertook to provide the capital for a new plant in the United States which would supply 500,000,000 rounds of small arms ammunition in 1916.[4]

(*b*) Organisation of Manufacturing Groups.

Another method was to bring together powerful groups or combinations of financiers and manufacturers who would undertake the responsibility of accepting very large contracts from the British Government. The advantage of an arrangement of this kind, from the point of view of the British Government, was that it only had dealings with a very substantial corporation whose financial and technical capacity was unimpeachable. Much of the actual work under the contract might be let out to sub-contractors, but the British Government was relieved of the task of getting the components collected and assembled, and of the complication of numerous contracts with small companies. The best example of Messrs. Morgan's efforts in this direction is the formation of the group for the production of shells under the direction of one powerful firm in association with three other firms of equal standing.[5]

(*c*) Development of New Processes.

The Commercial Agents were on the alert to discover a way of escape from a position which left the British Government dependent on an American ring for important components of explosives. They encouraged Mr. T. A. Edison in his experiments with a toluol process,[6]

---

[1] N.Y. 1589, L. 2595, N.Y. 1622, L. 2636.
[2] N.Y. 1177.
[3] N.Y. 1751, L. 2764, N.Y. 1794.
[4] N.Y. 3214, L. 4262.
[5] 1 March, N.Y. 1176, N.Y. 1339, 1183, L. 2204. See also the formation of the Remington Arms Union, N.Y. 1751.
[6] N.Y. 1144, 1149, 1184.

and stimulated efforts to develop a process for producing synthetic aetone,[1] while possible substitutes for other requirements were experimented with.[2] Another suggestion, put forward by Messrs. Morgan on 14 June, was that the British Government should couple its orders for materials which were difficult to procure with orders for materials which could be manufactured at a substantial profit. Thus, they suggested that orders for nitro-cellulose powder and cordite should be given to those manufacturers who would undertake to supply a certain amount of acetate of lime or acetone.[3]

IV. Negotiation of Terms of Contracts.

Messrs. Morgan's general instructions were "to endeavour to secure for His Majesty's Government the most favourable terms as to quality, price, delivery, discounts, and rebates,"[4] and they were authorised to use their discretion in adjusting the details of contracts to the best advantage.[5] They frequently found it impossible to obtain the conditions required by the War Office, and, in such cases, obtained direct authority to waive these conditions.

Occasionally the War Office laid down in advance the general lines on which they wished the contracts to be framed. With regard to shells, for instance, the agents were informed on 4 February that the War Office wished to take a stated weekly supply for a fixed number of months, with a right to continue taking the further output for the duration of the war, subject to termination by the War Office.[6]

At first the War Office refused to accept offers, however tempting in other respects, under which delivery would not be complete before the end of 1915.[7] Responsible manufacturers, however, refused to promise early deliveries, and pressed for long contracts which would warrant expenditure on the new plant required.[8] The task of adjusting these conflicting interests as far as possible fell to the Commercial Agents.[9] Occasionally, as on 27 January, the War Office instructed Messrs. Morgan to try and obtain an option on certain deliveries about which they were undecided, but owing to the pressure of competing offers manufacturers would not allow options to remain open for more than a few days.[10] In the case of rifles, the War Office was obliged to make contracts which involved accepting deliveries in the latter part of 1916, as the rifle manufacturers would not enlarge their plant until they secured orders extending over a long period.[11]

---

[1] L. 4785, N.Y. 3827 (16 June).
[2] *e.g.*, T.N.T. substitute, L. 1059, N.Y. 1127, L. 2156.
[3] N.Y. 3777.
[4] See clause 2 of the Agreement.
[5] N.Y. 1123, L. 2159.
[6] L. 2154.
[7] *e.g.*, L. 1089, 2121, N.Y. 1113, L. 2186, 2348, 2949.
[8] *e.g.*, N.Y. 1029.
[9] *e.g.*, Nitro-cellulose powder, N.Y. 1097, 1098.
[10] *e.g.*, L. 1081, N.Y. 1067, 1108.
[11] 8 March, N.Y. 1401, 1453.

Messrs. Morgan, however, often secured an option of obtaining further supplies from a company at the termination of contracts then being negotiated.[1] One firm, for instance, on 30 March, gave the War Office the option of placing orders that would absorb their capacity after October 1916.[2] Later (14 May) the War Office informed their agents that the question had been raised whether this condition of continuing production indefinitely (which had been obtained in certain contracts) was legally binding upon the manufacturers, and they were asked to keep this point in view.[3]

Some American firms asked for the payment of a bonus to secure early deliveries, but the War Office declined this suggestion (19 March) on the ground that such an arrangement would create an inconvenient precedent and would be followed by similar demands from other companies.[4]

(*a*) Cancellation Clauses.

Messrs. Morgan were on the whole very successful in inducing companies to admit into contracts, clauses giving the buyer the option of cancelling the contract if deliveries were in default for any reason except *force majeure*.[5] The agents were instructed to insert a clause giving the War Office the right to refuse deliveries in arrear under the contract, but though this provision was obtained in a large number of contracts, in a few cases the sellers declined to admit it.[6]

(*b*) Embargo Clauses.

The danger of an embargo being issued by the United States Government forbidding the export of munitions had to be kept in view. In some contracts the seller insisted that the War Office should accept goods delivered at the factory, even though their export from America should be forbidden by subsequent legislation.[7] The War Office pointed out that these conditions might turn out to be very onerous (4 February) but accepted them as it had accepted similar provisions previously.[8] Though Messrs. Morgan thought it was improbable that such a contingency would arise,[9] they succeeded in obtaining the insertion of a clause in many contracts, protecting the interest of the War Office in the event of an embargo.[10]

---

[1] *e.g.*, L. 2105, 4086.
[2] N.Y. 1645. See also negotiations with Remingtons, L. 2103, N.Y. 1114.
[3] L. 4346.
[4] L. 2531.
[5] *e.g.*, L. 2934, N.Y. 1097, L. 4207, N.Y. 3134.
[6] L. 2934, 2147, 2161, N.Y. 1130, N.Y. 3497.
[7] N.Y. 1117, 3134, L. 4207, N.Y. 3869.
[8] L. 2152, N.Y. 1123. See also negotiations with Bethlehem Steel Company, N.Y. 1795, 1796, L. 2798, N.Y. 1834.
[9] N.Y. 1795, 1796.
[10] N.Y. 3134, 3668.

(c) Surety Bonds.

In order to secure the War Office against loss in case of failure to carry out the contract by small contractors who had received advance payments, Messrs. Morgan often succeeded in getting the company to provide a surety bond obtained from some company like the Guaranty Trust Company of New York,[1] but the larger corporations were much more independent.[2] As the munition business developed it had become more and more difficult for contractors to obtain surety bonds, as the guarantor companies were unwilling to increase their liabilities. Moreover, the financial responsibility of the large contractors was quite equal to that of the companies from whom the surety bonds would have been obtained, and the War Office agreed to waive the surety bond.[3] In such cases, one quarter per cent., or one half per cent., the cost of obtaining a surety bond, was deducted from the advance payment agreed upon by the War Office.[4]

(d) Changes in Specifications.

In a few cases Messrs. Morgan complained of the delay in the provision of the full specifications to which they were entitled under Clause 5 of the agreement, but the chief difficulty arose from changes made in the specifications after the signing of the contract, which necessitated further negotiations with the manufacturers.[5] In some cases the contractors accepted the alteration without raising the price of the finished article, but as a rule prolonged and delicate negotiations ended in the War Office conceding some advance of price. Occasionally, a misunderstanding about the specifications necessitated adjustment, as when a company making small arms ammunition proposed to use gilding metal instead of cupro-nickel.[6] When a change in specification meant a simplification of the processes of manufacture, as in the case of the new drawings for shells, the War Office contended that a reduction in price should be made.[7]

(e) Reduction of Prices.

The centralisation of purchases through Messrs. Morgan undoubtedly led to some reduction of prices, and their achievements in this direction were commented on by Mr. D. A. Thomas as follows :—

> "I had no personal knowledge of the way in which the purchase of munitions was conducted in the months prior to January last, when the Morgan agreement was concluded, but it is evident that owing to insufficient knowledge of industrial conditions in the

---

[1] *e.g.*, L. 2173, N.Y. 1195.
[2] L. 2201, N.Y. 1182, L. 2221, N.Y. 1220, 1245, 1795, 1796, 3026.
[3] L. 2221, 2246, N.Y. 3026, L. 4020.
[4] N.Y. 1248, L. 4020, 4059, N.Y. 3099.
[5] *e.g.*, rifle stocks (L. 4096); the conflicting instructions as to gun-cotton (L. 1046, 2233).
[6] 15 February, L. 2268, N.Y. 1261, 1388.
[7] 5 March, L. 2390. See also L. 4696, N.Y. 3895.

States, contracts were made at that time which ought never to have been made, and that extravagant prices were paid. The most notorious instance, perhaps, is the contract for 18-pounder high-explosive shells given to [an engineering company]. Of this contract it is sufficient to remark that the price paid for all shells delivered before 1 September, 1915, is $9·00, and for shells delivered thereafter $8·00. In the course of recent negotiations with Messrs. Morgan for the continuation of his contract, [the manufacturer] agreed to reduce his price to $5·50, and it is probable that he would have accepted a still lower price if your Department had not decided against giving him a further order. . . . Messrs. Morgan were confronted, when they took over the agency, with the difficult task of reducing prices that had been abnormally inflated by previous methods of doing business. It is easier to keep prices down than to get them down, but I consider that the results obtained in this respect have been remarkable, and I attribute these results entirely to the genius of Mr. Stettinius".[1]

Other striking instances were contracts for fuzes (8 March), for nitro-cellulose powder (13 March), for shells (15 March and 6 April), in all of which cases Messrs. Morgan were congratulated by the War Office on the success of their work.[2] They were also congratulated on the reduction in price obtained on 30 April, after a very difficult negotiation on behalf of Russia for 1,000,000 rifles.[3] The fact that these reductions of contract prices were obtained at a time when the cost of labour and of raw materials were rapidly and continually advancing is striking evidence of the value of centralised purchasing.[4] Their task was rendered more difficult by the demoralised condition of the labour and of the material market, but the suggestion that a condition should be inserted in future contracts forbidding the seller to interfere with the employees or the sources of supply of other contractors, was not found to be practicable.[5]

V. Shipping Arrangements.

(*a*) Appointment of Messrs. Lunham & Moore.

Clause 6 of the agreement stated that the Commercial Agents should have general supervision over the shipment of goods, " making all necessary arrangements within their power up to and including the actual shipment." It soon appeared, however, that they had not the experience necessary for dealing with a very difficult problem.[6]

---

[1] Hist. Rec./R./1141/5.

[2] N.Y. 1400, L. 2406, 2404, 2447, N.Y. 1457, 1477, L. 2457, 2478, N.Y. 1749, L. 2736, 2740, 2770.

[3] N.Y. 1673, 3010, 3155, L. 4064, 4136, 4142.

[4] *e.g.*, N.Y. 1138, 1214, 1223, 1365, 1749, 1751, L. 2524.

[5] One of the largest munition companies complained that important members of their organisation were being tempted away by new firms, who had obtained munition contracts. See also L. 4793, N.Y. 3864.

[6] N.Y. 1096, L. 2315.

At the beginning of March, 1915, the congestion of the American railways with goods awaiting shipment was so great that the railways refused to furnish any additional cars until they were informed of the dates of arrival of steamers, and the War Office asked the Commercial Agents to make the best arrangements they could for demurrage and storage.[1] On 23 March Messrs. Morgan reported that time and expense would be saved if the British Government had its own shipping organisation, or employed a firm of forwarding agents.[2] This suggestion was taken up, and it was decided at an Admiralty conference with shipping experts (26 March) that all shipments of war material in the United States should be placed in the hands of a reliable firm of American forwarding agents, " who would attend not only to ocean transportation but to such railroad freight arrangements and temporary storing arrangements as might be necessary." Messrs. Lunham & Moore, who were suggested in this connection, were reported on by Messrs. Morgan as " highly regarded, believed to be competent, and entirely free from any German affiliation or sympathies." Messrs. Lunham & Moore suggested that they should be paid the usual freight brokerage of $1\frac{1}{4}$ per cent. on the cost of the freight, and on 30 March the Admiralty authorised Messrs. Morgan to accept this arrangement in principle, and asked them to have a draft contract drawn up and submitted to the Admiralty for approval.[3] The draft contract was despatched on 9 April, and pending its execution Messrs. Lunham & Moore attended to necessary business.[4]

On the arrival of the draft contract, which does not appear to have been received until 6 May, the question was raised as to whether the brokerage of $1\frac{1}{4}$ per cent. included distribution and railway routing in Great Britain.[5] Messrs. Lunham & Moore's view was that the $1\frac{1}{4}$ per cent. covered their final destination beyond the seaboard of Great Britain " when the shipments moved on a through bill of lading to such a final destination," but that when the shipments moved on a bill of lading only to the seaboard in Great Britain, the distribution and routing should be arranged through Messrs. Lunham & Moore's London house and be paid for accordingly.[6]

Some difficulty was caused by the fact that the War Office was unwilling to give the shipping agents a complete list of the orders placed in the United States, as they thought it undesirable that an an outside firm should know the extent of the British Government's munition contracts in America.[7] As, however, it was necessary for Messrs. Lunham & Moore to have some information as to the deliveries which might be expected to come forward, Messrs. Morgan were asked (19 April) to work out a method by which the shipping agents should be informed in advance of the amount of tonnage required and of the particulars and location of the stores they had to collect and forward.

---

[1] N.Y. 1350, L. 2392. [2] N.Y. 1548. [3] L. 2607, N.Y. 1631, L. 2653.
[4] N.Y. 1800. The terms of this contract were later varied. See below, p. 56.
[5] L. 4216, N.Y. 3094. [6] L. 4051, 4216, N.Y. 3235. [7] 19 April, L. 2922.

The Commercial Agents, in reply (28 April), pointed out the difficulties which would arise from these instructions. If the shipping agents were not given a general list of the contracts they would be unable to anticipate the cargo space required, and would have to pursue a hand to mouth policy from week to week. Messrs. Morgan, therefore, urged that Messrs. Lunham & Moore should be given a list of the contracts,[1] but, for various reasons, the War Office maintained its position.[2]

Instructions as to the despatch of invoices, marking the packing cases with identification numbers, and so on, were sent to the shipping agents through Messrs. Morgan, and to avoid publicity, the latter were instructed to consign all shipments in their own name, cabling the particulars to their London house. On 6 May, Messrs. Morgan asked for authority to reimburse the shipping agents for freight prepaid by them in order to facilitate shipment.[3] The Commercial Agents were informed on 6 February that no insurance was necessary from the time when the goods passed at the War Office risk, as the War Office carried their own insurance.[4]

(*b*) Proposals for Reporting Progress and Checking Deliveries under Contracts.

Under the agreement of 15 January, there was no specific indication of the duty of the Commercial Agents with regard to reporting progress on the contracts placed by them, and the verification of deliveries made under those contracts. The vital importance, however, of some supervision of progress and delivery was obvious. The War Office took the view that it was part of the duty of their agents to attend to such matters, and on 19 April Messrs. Morgan were asked whether they received periodical statements of deliveries from the manufacturers with whom they had placed contracts, so that they might know if deliveries were being punctually made, and if not, take such steps as might be necessary for speeding up deliveries. The firm was also asked what evidence they received, when making final cash payments, to enable them to verify the quantities delivered.[5]

Messrs. Morgan replied, on 28 April, that they kept a record of shipments and, therefore, knew if deliveries were being made punctually but suggested that the verification of quantities should be done by the British military inspectors.[6] But, owing to lack of a sufficient staff, the military inspectors were unable to undertake this, and on 13 May the Commercial Agents were again requested to work out a plan in consultation with Colonel Phipps, and discuss the appointment of a suitable firm to carry out this very confidential work.[7]

---

[1] N.Y. 3095, 3218. These instructions to the Commercial Agents to organise the procedure under which Messrs. Lunham & Moore were to work were referred to by Mr. Whigham when he complained on 12 May, that the firm had been called upon to organise plans for shipping arrangements never contemplated under the Agreement. See above, p. 9.

[2] L. 4253, L. 4602.

[3] N.Y. 3224.

[4] N.Y. 1143, L. 2170.

[5] 19 April, L. 2922.

[6] N.Y. 3095.

[7] 13 May, L. 4343.

Messrs. Morgan thought that it would be less expensive and more satisfactory to augment Colonel Phipps' staff with civilian employees than to appoint a firm to do the work independently,[1] but Colonel Phipps objected to this proposal.[2] It was obviously necessary, however, to organise some method of checking deliveries. The financial authorities at the War Office were anxious to get proper evidence from Messrs. Morgan that the deliveries had actually been made to Messrs. Lunham & Moore, and the War Office inspectors were requested to satisfy themselves that the cases contained the proper quantity of goods of the stipulated quality (14 June).[3]

A few days afterwards Messrs. Morgan reported that in most cases it could be arranged that payment should not be made until the shipping agents had taken possession of the goods, and given a certficate that the numbers of the packages corresponded with the number stated on the invoices. This, however, would not meet the question of verifying quantities when the goods were bought f.o.b. at the factories, in which case the sellers would require payment before the goods were delivered to Messrs. Lunham & Moore.[4]

The whole situation was clearly unsatisfactory. As has been seen in a previous chapter,[5] Messrs. Morgan took the view that the arrangement by them of an "organisation for checking deliveries under the contracts was a service never contemplated under the original plan," and after the formation of the Ministry of Munitions this work was transferred to the American Branch of the Department.[6]

(*c*) DETECTIVE ORGANISATION.

On 3 March the War Office enquired what precautions were being taken to protect munitions of war in the factories and in transit to the seaboard from attacks.[7] The Commercial Agents replied that they believed that manufacturers were taking all precautions and that the possibility of risk had had some influence on the high prices asked.[8] After further investigation they recommended that all contractors should be asked to inform them by letter of their usual, and under existing conditions, their extraordinary precautions, which letters would be transmitted to the British Government.[9] A rumour of a plot to destroy the Remington works at Ilion was brought to the company's notice on 23 March.[10] The question of the protection of war supplies in transit from the factory to the steamer was an important one, and it was arranged that Messrs. Lunham & Moore should employ a special force of detectives.

---

[1] 14 May, N.Y. 3331.
[2] Part of cable missing. N.Y. 3479.
[3] L. 4769.
[4] N.Y. 3851.
[5] See above, p. 9.
[6] See below Chap. IV.
[7] L. 2372.
[8] N.Y. 1379.
[9] N.Y. 1548, 23 March.
[10] L. 2561, N.Y. 1564.

VI. Financial Procedure.

In accordance with the procedure laid down at the Treasury conference on 25 January, 1915,[1] accounts known as the Commercial Agency Account and the Special Stores Account were opened with Messrs. J. P. Morgan & Company on 26 and 27 January, the Remount Commission Account being transferred to them shortly afterwards.[2] From 2 March onwards,[3] Messrs. Morgan cabled at the beginning of every week an estimate of the approximate sums to be paid on behalf of the War Office during that week. The War Office immediately paid Messrs. Morgan, Grenfell & Company the equivalent amount in sterling, which was transmitted by cable transfer to New York, and by the first mail after the end of each calendar month the Commercial Agents sent the War Office a statement of cash transactions for the month supported by vouchers receipted by the payees, attached to which were contractors' invoices showing deliveries, advances made, and advances recovered.[4]

The question of the interest to be allowed on Government balances had not been settled at the Treasury conference, but had been left over for subsequent discussion,[5] and on his visit to England Mr. J. P. Morgan arranged that 2 per cent. per annum was to be allowed on the daily balances on the Government account, which was to be credited quarterly (14 April).[6]

Clause 16 of the agreement provided that the agent's financial interest in all companies with whom contracts were placed should be disclosed, and in May the firm wrote a letter giving this information up to 30 April, and arranged that in future such information should either be given in the cable accompanying the offer, or in a letter sent with the monthly accounts.[7]

The War Office decided (12 April, 1916) that the documents sent to England by the agents in support of their accounts were so complete that it was not necessary to insist on the local audit provided for under Clause 12 of the agreement.[8] The War Office retained the responsibility for the financial and accounting work in connection with the Commercial Agency Agreement until 31 July, 1917, when it was arranged, with the approval of the Treasury, that the responsibility should be transferred to the Ministry of Munitions as from 31 March, 1917.[9]

---

[1] See above, p. 6.
[2] L. 1043, 1065, N.Y. 1052, 1082.
[3] N.Y. 1343.
[4] Letter from Messrs. Morgan, Grenfell, to the Director of Army Contracts, 14 May, 1915 (MF./Gen./1486).
[5] See above, p. 7.
[6] L. 2853, N.Y. 1908, L. 4547, N.Y. 3567.
[7] L. 4409, N.Y. 3398.
[8] M.F./Gen./1486.
[9] D.F. 1/U.S.A./12.

VII. General Services.

(*a*) Work in connection with Contracts not Placed through Messrs. Morgan.

The Commercial Agents had undertaken "to facilitate the completion and shipment of orders already placed, and to assist in the completion of contracts in course of negotiation at the date of their appointment." [1] In this connection they were asked to make payments as they became due under these and other contracts not placed through them.[2] Most of these latter were for "forage and foodstuffs and certain types of motor vehicles which could only be procured through particular firms of agents."[3] The firm also undertook on 17 May to pay all proper transport charges on such contracts and to pay Lloyd's Register their inspection charges under Admiralty contracts,[4] but demurred to a War Office request (14 May) that they should arrange a system of marking cases and forwarding invoices on contracts placed before they became agents.[5]

Another service undertaken by the firm was the forwarding of messages between the Admiralty and Sir Trevor Dawson, and between the War Office and Captain Jenkins, the buyer of aeronautical requirements.

(*b*) Co-operation with War Office Inspectors.

The inspection of munitions bought in America was undertaken by inspectors specially appointed by the Chief Inspector, Woolwich, who, owing to the shortage of trained staff, found it very difficult to spare competent men for the task. Arrangements were made for the proof of ammunition, propellants, explosives, etc., at proof ranges belonging to the Bethlehem Steel Company, and to Messrs. Dupont & Company in December, 1914,[6] and at the Hercules Powder Company's range in February, 1915.

Messrs. Morgan's relations with the inspectors appear to have been excellent, and the firm paid a tribute to the "broad support and hearty co-operation" extended to them by the Chief Inspector, Colonel Phipps.[7] Before concluding contracts with far distant manufacturers the agents ascertained how far this would be convenient to the War Office inspectors.[8] Copies of all contracts signed, but with the prices

---

[1] See Clause 10 of the Agreement.
[2] *e.g.*, L. 4001, 4030, 4161, 4720, 4807, N.Y. 3038, 3910.
[3] Memorandum by the Director of Army Contracts, June, 1915. In May, Messrs. Morgan undertook to make these payments gratuitously, provided they were indemnified against the consequences of any mistakes. See above, p. 14.
[4] L. 4371, N.Y. 3711.
[5] L. 4352, N.Y. 3916.
[6] Contracts/P./2067.
[7] L. 1036, 1050, 1075, N.Y. 3949.
[8] L. 2385.

omitted, were furnished by them to the inspectors.[1] To meet a protest by the Chief Inspector, Woolwich, who thought that the omission of prices reflected upon his staff, Messrs. Morgan were later authorised to communicate prices confidentially to the Chief Inspector in America and his assistants, who were instructed not to communicate these prices to their subordinates.[2]

When the military inspectors were not available, Messrs. Morgan, at the request of the War Office, appointed inspectors and arranged for inspection,[3]—work which they considered to be outside the sphere of their agreement.[4]

(c) Investigation of Rumours of German Influence or Activity.

At the request of the War Office, Messrs. Morgan investigated a variety of rumours as to German influence or connections in the United States, most of which turned out to be baseless.

Thus, in January, they were able to dispose of the rumours that Messrs. Dupont had contracts for explosives with Germany,[5] that Germany was attempting to restrict the exportation from the United States of finished material in which German dyes were used,[6] and that the National City Bank and the Guaranty Trust of New York were doing a large business with Germany.[7]

The rumour that there was to be a gigantic manipulation of the spelter market by German interests, with a view to depriving the Allies of munitions of war, was investigated by Messrs. Morgan early in June.[8] Their report was reassuring, but the fact that one chemical company declined to sign their contract as soon as they discovered that the purchaser of their spelter was the War Office, suggested the existence of German influence in the market. The company, however, were willing to conclude the contract if it were signed by a member of Messrs. Morgan's organisation in his own name.[9]

A rumour that large purchases of Bethlehem Steel Company stock were being made on German account, was investigated at the beginning of April. The president of the company, interviewed by Messrs. Morgan, stated that he and his associates owned 50 per cent. of the company's stock, and had no idea of disposing of it. The recent activity in the stock was purely speculative. Negotiations had been opened by a certain group with a New York bank with

---

[1] L. 2487.
[2] 94/Gen./11 (3 May, 1915).
[3] *e.g.*, aeronautical stores, bromine, machine tools, rails; L. 2801, N.Y. 3847. 3952, L. 4753.
[4] See above, p. 9.
[5] L. 1012, N.Y. 1008, 1011.
[6] N.Y. 1078.
[7] L. 2135, N.Y. 1115.
[8] L. 4659, N.Y. 3660.
[9] L. 4659, 4663, N.Y. 3660, 3696.

a view to obtaining a loan of $50,000,000 to purchase control of the Bethlehem Steel Company, but had not been seriously considered.[1] Mr. C. M. Schwab confidentially confirmed the president's statement, and stated that there was no need for anxiety about the company accepting orders from Germany as "if not for friendly reasons he was quite too wise to consider any such proposal."[2] In a later interview[3] the same attitude was taken up by the officials of the company, and Messrs. Morgan got the impression that Mr. Schwab was proud of the record his company was making, and that he would do all he could in the interests of the British Government.[4]

The Commercial Agents also reported, at the request of the War Office, on the rumour that an embargo was to be placed on the export of munitions of war to belligerents,[5] and on the effect of the German War Zone announcement on American opinion.[6]

VIII. Negotiations for Joint Purchasing by Allied Governments.

(*a*) Competition of Allied Governments.

In January and February, 1915, the countries competing in the American market for a supply of munitions included, in addition to Great Britain, France, Belgium, Russia, and Serbia, while dealers and contractors were playing them off one against the other.[7] Thus, on two occasions, supplies of T.N.T., for which Great Britain was negotiating, were bought by Belgium.[8] On the second occasion, T.N.T., offered to the War Office by Messrs. Morgan at $1.40 per lb. (1 February), was bought by the Belgian Government at $1.55, owing to the fact that the War Office hesitated to pay more than $1.20.[9] One firm's output of explosives was being competed for by the Allies, and the War Office discovered from private sources that the firm were playing the British and Russian Governments (the latter negotiating through Messrs. Vickers) off against each other.[10]

The rise in the price of picric acid during February was attributed by Messrs. Morgan to the negotiations of the French Government.[11] Evidence of the same kind might be multiplied almost indefinitely, and it was clear that the evils of this situation could only be cured by the adoption of some scheme for joint purchasing by the Allied Governments.

---

[1] L. 2722, N.Y. 1765, L. 2744.
[2] N.Y. 1827.
[3] 18 June, N.Y. 3872.
[4] This is a reply to cables 3773 and 4664 in private book.
[5] 4 March, 26 April, L. 2379, N.Y. 1372, L. 4054, N.Y. 3087.
[6] 6, 8 February, N.Y. 1139, 1148.
[7] N.Y. 1314, 1032, 1099, L. 2291. Later on there was competition from Italy, Portugal, Spain, Holland, China and Greece. (L. 2419, N.Y. 1751, 3669, L.4652.)
[8] L. 1017, N.Y. 1009, 1012, L. 1022, 1046, N.Y. 1032.
[9] N.Y. 1084, L. 2215, N.Y. 1101, 1125.
[10] L. 1090 (28 January, 1915).
[11] N.Y. 1514.

(*b*) French Supplies.

Early in February, 1915, a scheme for joint purchasing by Great Britain and France in America was discussed, and the Commercial Agents urged the advantages of concentrating all purchases through the British War Office.[1] At a conference in Paris, at which members of the firm were present [2] (about 6 February), agreements were drawn up appointing Messrs. J. P. Morgan & Company agents for French, and, apparently, for Russian purchases as well, but, on Lord Kitchener's advice, the signature of these agreements was delayed. The negotiations in Paris had proceeded more rapidly than he had expected, and he thought that the procedure for joint action between the three countries should be settled before Messrs. Morgan's agreements with France and Russia became operative.[3] Messrs. Morgan explained (15 February) that "they had thought the joint purchasing scheme emanated from Great Britain, otherwise they would not have considered signing contracts with France and Russia without first submitting them to the British authorities. Their first aim was to serve Great Britain satisfactorily and they would deplore any undertaking which would jeopardise this." [4]

On 23 February, in anticipation of a meeting between the representatives of the Allied Governments at an early date, with a view to pooling purchases, the War Office asked their agents to work out a scheme for shell production as quickly as possible, as they did not wish the proposed shell contracts included in the pool.[5]

A representative of the French War Office came to London (about 24 April) to discuss these joint purchasing arrangements, and on 4 May M. Cambon informed Lord Kitchener that the French Government proposed to place its orders in the United States through Messrs. Morgan in future. In the case of difficulties arising through the Commercial Agents being instructed to buy the same thing by both Governments, Messrs. Morgan were to refer to both,[6] and it was agreed that such questions should be settled by direct consultation between Lord Kitchener and a representative of the French Government in London.[7]

Messrs. Morgan took the view that they were "retained to serve the British Government primarily, and therefore felt free to acquaint the War Office, in confidence, with any operation of the kind for one of the Allies," [8] and they, therefore, kept the War Office informed of their purchases for France and the price at which they were made.[9]

---

[1] L. 1056, N.Y. 1137.
[2] L. 2168.
[3] L. 2224.
[4] N.Y. 1207.
[5] L. 2307.
[6] See letter from M. Paul Cambon to Lord Kitchener on 4 May.
[7] C.R./2425.
[8] 1 February, N.Y. 1086.
[9] *e.g.*, N.Y. 1365.

The delicate situation that arose when both the French and British Governments instructed Messrs. Morgan to buy the same thing, may be illustrated by the purchase of bromine in June.[1] Being pressed by the Commercial Agents to decide how they were to divide such purchases as they were able to make, the War Office instructed them on 14 June, to close the contracts in the name of the British Government, as arrangements for division between the two Governments were pending. The French authorities, however, thought that the whole of the bromine purchased should be handed over to them, since they had begun negotiations for its purchase before Messrs. Morgan were appointed as their Commercial Agents, and the latter had simply taken charge of the negotiations for the purpose of completing the contract.[2] Messrs. Morgan's view of the position was slightly different. They admitted that they had begun investigating the market for bromine on French instructions, but stated that the War Office authorisation to purchase at the price of $1 to $1·05 per lb., was received before the French authority to buy at this high figure.[3] The position of one agent acting for both Governments was clearly a delicate one, but it offered an opportunity of joint action which promised to strengthen the position of the Allies in the American market.

(*c*) Russian Supplies.

The arrangement for making Russian purchases through Messrs. Morgan, suggested in February, was not confirmed, and until nearly the end of the period under review (January to June, 1915) the War Office had no definite authority to place orders for Russian supplies. Certain enquiries for Russian supplies were made by the War Office through Messrs. Morgan, from February onwards, but other orders were placed by the Russian Government through its own agents.[4] Gradually these agents were eliminated.

On 3 February Messrs. Morgan were authorised to approach Russian representatives in the United States, who were making enquiries for the same munitions, and ask them to withdraw these enquiries, as the British War Office had instructed them to make these purchases for the Russian Government.[5] Later (8 March) Messrs. Morgan were asked by their French house to undertake the purchase of 3,000,000 rifles for Russia, and on 8 March they asked if the War Office desired them to do this.[6]

On 17 May Messrs. Morgan were informed that the War Office had been given practically a free hand by the Russian authorities, and they were requested by the Director of Army Contracts to take up the question of obtaining a supply of shells for Russia with the utmost

---

[1] N.Y. 3724, 3790, L. 4788, 4902.
[2] 23 June. N.Y. 3956, L. 4902.
[3] N.Y. 3956.
[4] L. 2107.
[5] N.Y. 1099, L. 2137.
[6] N.Y. 1401.

despatch.[1] A few days later, on 21 May, the War Office again urged the gravity of the situation upon their agents, who were told that these War Office enquiries for Russian shells were "the most urgent and vital of all the enquiries made through them" and if substantial supplies could be obtained during the last months of the year any additional cost in reason would be agreed to.[2]

Delays and difficulties from the Russian side followed.[3] The War Office vision of obtaining a free hand did not materialise, though on 3 June they informed their agents that satisfactory progress had been made in the arrangements for placing Russian orders, and that the War Office was really to have a free hand in the future.[4] Messrs. Morgan replied that they were "greatly relieved and delighted."[5]

The memorandum by the Director of Army Contracts (June, 1915) shows that Messrs. Morgan had undertaken at the request of the War Office the negotiation of purchases in the United States for the Russian and Serbian Governments, "orders being transmitted to New York upon instructions received from a committee consisting of representatives of the War Office and Ministry of Munitions and the delegates of Russia or Servia, as the case may be, on the International Commission."

The placing of Russian orders was attended by special difficulties. The delay in getting replies from Russia meant that many favourable offers were withdrawn in the meantime,[6] but the War Office, though fully admitting that the situation was unsatisfactory, were unable to improve it. In one case Messrs. Morgan were told, in the strictest confidence, that as a last resort, the War Office were prepared to close the contract themselves.[7] The War Office also found it hard to convince the Russian authorities of the necessity of making many of the purchases suggested to them.[8] The difficulties of the situation are illustrated by the fact that on one occasion, when the Russian Government complained of delay in the deliveries under a contract, it was discovered after investigation that the Russian agents instructed to complete the contract had not done so.[9] Again, it was not easy to induce American manufacturers to meet Russian requirements for complete rounds of gun ammunition, as no company except the Bethlehem Steel Company had any experience of loading shells with high explosive.[10] There was the further complication of arranging for the firing tests, which had to take place in America and a range provided for the purpose.[11]

---

[1] L. 4275.
[2] L. 4455, 4457.
[3] L. 4572.
[4] L. 4627
[5] N.Y. 3632.
[6] *e.g.*, L. 2475, 2485, N.Y. 1604, L. 2796, 2799, 4572.
[7] L. 2799.
[8] *e.g.*, the purchase of picric acid at a favourable price. (L. 2181, 2202, 2213.)
[9] L. 4529. N.Y. 3532.
[10] *e.g.*, 4 February, N.Y. 1116, 18 May, L. 4411, 2 June, N.Y. 3586.
[11] N.Y. 1862.

Messrs. Morgan had to conduct the technical part of the negotiations for Russian supplies under a severe handicap. It was extremely difficult to get hold of official specifications and drawings.[1] Sometimes they had to be sent for from London, sometimes from Russia, and when, after delay prejudicial to the negotiations, they finally arrived they were found to be in Russian.[2] Messrs. Morgan refused to take the responsibility of having them translated in the United States, and had to await the arrival of an official translation.[3] The delays were so great that Messrs. Morgan undertook the delicate business of trying to borrow specifications from firms who were working on them.[4]

The fact that some Russian representatives continued to make purchases independently had unfortunate results.[5] In March they were making enquiries for toluol at much higher prices than the British Government was paying,[6] and about the same time Russian enquiries for small arms ammunition so excited the market that manufacturers were reluctant to make firm tenders,[7] though early deliveries were of vital importance. Messrs. Vickers were negotiating for Russian supplies as late as 1 June,[8] and on 8 June Messrs. Morgan reported that a number of unauthorised enquiries for Russian shells was raising the price of spelter.[9] The Russian military inspectors in the United States were suspicious of and almost hostile to Messrs. Morgan,[10] and rigid and arbitrary towards the manufacturers, whose complaints were many and bitter.[11]

To meet this difficulty Messrs. Morgan suggested that provision should be made in the contracts for disputes between the Russian inspectors and the firm to be submitted to arbitrators.[12] The position improved after the appointment of General Hermonius, who reached London early in June with authority to consult with the War Office on the question of Russian supplies and to decide technical points raised by the Russian inspectors in the United States, which had previously been referred to Petrograd.[13]

The question of signing Russian contracts when they had been finally settled also involved difficulties. Messrs. Morgan were unwilling to sign without formal instructions from the proper Russian Government official, and even if such authorisation were readily obtainable, which Messrs. Morgan doubted, some American manufacturers were inclined to demand a guarantee of Russian credit which would both offend the *amour propre* of Russia and damage her credit in the United States.[14] The War Office therefore authorised Messrs. Morgan to sign certain contracts in the name of the British Government, rendering

---

[1] *e.g.*, N.Y. 2520, 3553, 3586, 3836, L. 4364. See also Vol. II, Part VIII. There were similar difficulties over Serbian specifications. L. 4581, N.Y. 3710.
[2] L. 4630.
[3] N.Y. 3628.
[4] N.Y. 3904.
[5] *e.g.*, N.Y. 1129, 1133, L. 2162. L. 2512.
[6] L. 2512.
[7] N.Y. 1402, L. 2485.
[8] L. 4604.
[9] N.Y. 3660.
[10] N.Y. 3495.
[11] *e.g.*, 15 May, N.Y. 3368.
[12] N.Y. 3368, L. 4459, 4460, 4627.
[13] L. 4736.
[14] 20 April, N.Y. 1954.

separate accounts in respect of purchases for Russia.[1] On 1 June the War Office announced that it was practically settled that all Russian contracts placed by Messrs. Morgan under instructions from the War Office would be signed in the name of the British Government.[2]

In placing Russian orders Messrs. Morgan had general instructions from the War Office that the sources of supply for Great Britain must not be interfered with. Tenders for Russian small arms ammunition might be obtained from companies who were unable or unwilling to manufacture Mark VII.[3] In the same way the War Office was anxious for some assurance that their large contracts with the Bethlehem Steel Company should not be prejudiced by placing considerable Russian orders with them. After a conference with the firm, Messrs. Morgan reported that they stated, with great definiteness, that " their relations were such that they would, under no circumstances, consider any business which could in any way affect their engagements with the British Government." [4]

The War Office had to try and hold the balance between the French and Russian Governments when it came to a question of competition for supplies, and the fact that both were acting through Messrs. Morgan enabled them to do so. For instance, when a negotiation for small arms ammunition, prolonged by Russian delays, was nearing a successful conclusion (14 May) and the French came in with an offer, the War Office asked Messrs. Morgan to explain that the War Office had been negotiating for this source of supply for a long time. If the French were still anxious to secure the supply, Messrs. Morgan were to ask them to confer with the Secretary of State for War in the matter so that it could be decided which party needed the supply most, in accordance with the arrangements recently made in London. In the meantime, Messrs. Morgan were instructed not to tell the French that the British negotiations were really on behalf of Russia.[5]

(*d*) Serbian Supplies.

Enquiries for Serbian supplies were made from March, 1915, onwards, the contracts being placed for the War Office by Messrs. Morgan and signed by them as Commercial Agents in the usual way.[6]

---

[1] *e.g.*, 1 May, contract with Winchester Rifle Arms Company, L. 4149, 4286.
[2] L. 4605, 4756.
[3] L. 2449, *e.g.*, the Peters Cartridge Co., which wished to undertake the simpler Russian cartridge, N.Y. 1432.
[4] N.Y. 1414.
[5] 14 May, L. 4356.
[6] L. 2406, N.Y. 1613, L. 2752, 2754, 2755.

CHAPTER IV.

THE GROWTH OF THE MUNITIONS ORGANISATION IN AMERICA IN 1915 AND 1916.

I. Mr. D. A. Thomas' Mission.

With the establishment of the Ministry of Munitions a new era in the organisation of munitions purchasing in America is reached. The firm of Messrs. J. P. Morgan & Company continued their work on the lines indicated in the preceding chapter, but on a scale enormously expanded by the greatly increased programmes adopted by the Ministry of Munitions.[1] With this great increase in the scale of their activities the necessity of providing some official organisation which would undertake the work of following up the contracts once they had been placed became still more urgent, and as soon as he became Minister of Munitions, Mr. Lloyd George asked Mr. D. A. Thomas to go out to the United States to assist in developing the American market. Speaking in the House of Commons on 23 June, Mr. Lloyd George said :—

> " He will represent and exercise the functions of the Munitions Department, both in Canada and the United States, and he will be given the fullest possible authority to discharge the responsible duties with which he is entrusted. There is not the slightest idea of superseding our existing agencies there. They have worked admirably. They have saved this country, I believe, millions of money. Mr. Thomas will co-operate with Messrs. J. P. Morgan & Company, the accredited commercial agents of the British Government in the United States of America, with a view to expediting in every way the supply of munitions." [2]

After investigating the position Mr. D. A. Thomas came to the conclusion that Messrs. Morgan's work was of the greatest value.[3] He reported that the weak spot of their organisation lay in the lack of effective arrangements for examining into the technical ability of tenderers to carry out the orders which they desired to obtain, and for following up contracts and expediting deliveries. The latter functions might perhaps have been regarded as falling to the corps of British military inspectors, but owing to the enormous area they had to cover and to the inadequacy of their numbers, it was impossible

---

[1] An indication of the extent of this increase may be obtained by comparing the value of orders placed by the War Office through Messrs. J. P. Morgan, with those placed by the Ministry of Munitions. See Appendix IV

[2] *Parliamentary Debates*, 1915 (H. of C.), lxxii, 1204.

[3] See above, p. 6.

for them to do much in this direction without detriment to their main function of advising on technical points, inspecting material, and passing goods for shipment.[1]

Mr. D. A. Thomas therefore appointed (12 July) a small advisory committee under Lieut-General L. T. Pease[2] to report on the engineering facilities possessed by new firms seeking contracts for munitions. The scope of General Pease's organisation was rapidly enlarged to deal with the work of speeding up deliveries and obtaining the accurate and systematic information on the progress of contracts placed in the United States which was urgently needed by the supply departments of the Ministry,[3] and the original advisory committee was expanded by Mr. D. A. Thomas into the British Munitions Board with General Pease as chairman and Lieut.-Colonel Phipps, head of the British inspectors in the United States, as deputy chairman (5 September).[4]

It was hoped that the new organisation would do away with the overlapping among the various officers and organisations then representing the British Government in the United States, and paying independent visits to manufacturers. The work of the Munitions Board fell into three sections. One department under Mr. J. P. Sneddon dealt with new work and investigated the capacity of firms not previously employed, another department under Mr. F. W. Abbott was concerned with following up the orders given to the various firms and making efforts to hasten delivery. Statistical records and progress, reports were dealt with by a third department under Mr. H. Japp and there were in addition two inspection departments which were not, strictly speaking, under the administrative control of the British Munitions Board. Of these one (under Lieut.-Colonel C. E. Phipps) was responsible for the technical inspection of guns, gun ammunition, etc., the other (under Major B. Smyth Piggott) was responsible for the inspection of machine guns, rifles, revolvers.

The division of function between the newly established Board and the firm of Messrs. J. P. Morgan was quite clear. The latter was concerned, as before, with the purchase of munitions ; they placed all orders, conducted all negotiations, and made all payments (the ultimate responsibility for this work being with Mr. Stettinius, head of their export department) but were relieved of any responsibility for watching the production of munitions under these contracts or arranging for transport and shipment.

---

[1] Report of Mr. D. A. Thomas to the Minister of Munitions on his Mission to Canada and the United States (copy in HIST. REC./R./1141/5).

[2] The other members of the Committee were Mr. H. Japp (later Sir Henry Japp), of the firm of Messrs. S. Pearson & Son, who had already been appointed by the Ministry to investigate progress on contracts for rifles, machine guns and small arms ammunition, and Mr. J. P. Sneddon, a consulting engineer.

[3] 94/Miscellaneous/32. Efforts were made to induce American contractors to send in weekly progress reports through the British inspectors, which proved of the greatest value (28 February, 1916).

[4] *Ibid.*

II. Mr. E. W. Moir's Organisation.

On 13 December, 1915, Mr. E. W. Moir (afterwards Sir Ernest Moir) sailed for New York to continue Mr. D. A. Thomas's work as the representative of the Ministry of Munitions in the United States, Mr. Lloyd George having given him full power to carry out any reorganisation he found to be necessary. On arrival he took over the functions and most of the staff of the British Munitions Board. The offices of the new organisation in Equitable Buildings, Broadway, New York, were run for a time in Mr. Moir's name, as the British Ambassador thought it unwise to identify them with the British Government, owing to the existence of strong feeling against the supply of munitions to Great Britain. General Pease returned to England.

(*a*) The Progress Department.

The reorganisation carried out by Mr. Moir redistributed the functions of the British Munitions Board, allocating the responsibility for the different classes of munitions to separate individuals, who jointly formed what was afterwards known as the Progress Department, under the direction of Mr. Moir, Mr. Japp being his chief-of-staff. Thus, shells and their components were assigned to Mr. F. W. Abbott; rifles and Vickers machine-guns to Mr. Harvey, with Mr. Reavill, of Enfield, as his rifle expert; Lewis guns, copper bands, friction tubes, 18-pdr. and 4·5-in. cartridge cases to Mr. Manton, and machine tools to Mr. F. Searle, with Mr. Lang as his expert adviser. Mr. Gibson, who arrived later, took over the supervision of small arms ammunition. Progress reports were entrusted to Mr. Alford, and the staff was completed by a chief draughtsman (Mr. Houghton), a cashier (Mr. McLaughlin), together with secretaries and typists. Mr. Sneddon, a specialist on the capacity of factories, was employed as consulting engineer to advise as and when needed.

The function of this Progress Department (or Quantity Inspection Department as it was sometimes called) was, in Mr. Moir's words, "to act as oil in the machine," and expedite delivery in every possible way by visiting the factories of the 300 contractors and 500 to 600 sub-contractors who had undertaken orders for the Ministry. It drew contractors' attention to cases where their sub-contractors were not likely to keep up to the mark, suggested new sources of supply, pointed out inefficient or ill-balanced plant, helped contractors to get additional plant, and suggested modifications of the conditions of quality inspection to the Inspection Department. It aimed, therefore, as will be seen below,[1] at removing the chief difficulties which retarded the production of munitions in America at the beginning of 1916.

[1] See below, p. 50.

(*b*) The Reorganisation of the Military Inspection Department.

The anomalous and quasi-independent position of the Military Inspection Department had already been unfavourably reported on by Mr. D. A. Thomas, who had urged in vain that the headquarters of the inspectorate under Colonel Phipps should be transferred from the Bethlehem Steel Works to New York.[1] General Pease and Messrs. J. P. Morgan & Company took the same view. Colonel Phipps objected on the ground that it was necessary for him to be there to supervise the proof-firing. Both Mr. D. A. Thomas and Mr. Moir made strong representations to the Minister that it was unwise for Colonel Phipps to tie himself down to mechanical details. His duties as head of the inspectorate were far too important and comprehensive to permit of his time being occupied with proof-butt work. His staff was inadequate numerically, and Mr. D. A. Thomas had been impressed by the unnecessary restrictions imposed upon him in regard to the fixing of salaries for inspectors and assistants engaged locally. Unfavourable reports from Woolwich on some of the American munitions showed that more inspection was needed. Further, it was undesirable that the chief inspector, who had to deal with the product of 250 firms, should be located in the office of one of the biggest of them. Mr. Moir urged that the practice of sending information from the Ministry to Colonel Phipps independently should be discontinued, in order that a record of all technical directions should be found in the New York office, and that all matters involving a change of design should be discussed by the chief inspector with Messrs. J. P. Morgan & Company, as such changes might affect dates of delivery and prices under contracts.

After commenting on the scale of remuneration of the inspectorate and the anomaly of Colonel Phipps' staff being paid from Canada, Mr. Moir stated that Colonel Phipps' staff showed a common dislike to civilian interference in military matters.

Mr. Lloyd George cabled his decision that the military inspectorate was to be reorganised and transferred to New York, General Minchin being sent to America to deal with the situation. General Minchin arrived on 14 April, and shortly afterwards the headquarters of the military inspectorate were transferred to New York, Colonel Phipps and his staff having taken up their quarters in Equitable Buildings by 1 May. Mr. Moir reported on 9 May that the new arrangement was working harmoniously, and that the closer touch between quality and quantity inspection would make for efficiency. At the same time General Minchin increased the staff of the inspectorate, certain officers for whom he cabled being sent out from England.

(*c*) Relations with Messrs. J. P. Morgan & Company.

Considerable friction between the American office of the Ministry and Messrs. J. P. Morgan was clearly apparent in March, 1916, when

[1] 11 November, 1915. 94/Miscellaneous/32.

Mr. J. P. Morgan and Mr. Stettinius visited England and discussed the situation with the Minister of Munitions. As has been seen above, Messrs. J. P. Morgan much resented negotiations in London between officials of the Ministry of Munitions and representatives of American firms, and it appears that a little later on Messrs. Morgan got the impression that the American Department of the Ministry proposed to place orders with new firms independently of them. In an interview with the Minister early in March they offered to give up the agency, and to help in setting up a new buying department, acting in an advisory capacity afterwards.

Mr. Lloyd George decided against this, and wrote on 9 March to Mr. Moir to the effect that a closer co-operation between his organisation and Messrs. J. P. Morgan & Company was desirable. He laid it down that all firms who offered new supplies or increased supplies should be referred to Messrs. Morgan, that there should be conferences between the offices and a frequent and informal exchange of views, that Mr. Moir's department should hand copies of all reports from their inspectors and of all progress reports to the Ministry to Messrs. Morgan, and should advise them in all matters which might help them in negotiating contracts. All cables received by either office were to be communicated to the other with discretionary exceptions.

The situation from the point of view of Mr. Moir's organisation appears in his letter of 31 March to the Minister. He gave reasons for his opinion that Messrs. Morgan's retention of the purchasing agency was desirable, and stated that no buying was attempted by his department, except in the case of machine tools,[1] and that all offers were transmitted to Messrs. Morgan. His favourable opinion of Messrs. Morgan's purchasing staff had been modified to some extent by the placing of the orders for fuses and copper bands, which, owing to Mr. Stettinius being over worked, had been entrusted to less competent hands. He thought the prices paid to certain contractors too high, and would have liked to have put some pressure on them. He suspected that Messrs. Morgan had complained that their work was hampered by a lack of information from his department, and stated that Messrs. Morgan were furnished with all reports by inspectors on the capacity and efficiency of the factories they visited, and with copies of Mr. Moir's confidential reports to the Minister. All cables on the output of munitions went through their office. The bi-monthly reports were not sent to the firm officially, but were copied in their office, and copies could have been kept. In future the firm would be sent a copy officially. On the question of the communication of cables, Mr. Moir deprecated all cables being sent through Messrs. Morgan, owing to the danger that some of their twenty or thirty cable clerks might have enemy sympathies. He proposed that very confidential cables on personal and staff matters should be sent as before through the Consul-General and the Foreign Office, and hoped that replies to them would be sent in the same way.

[1] See below, p. 55.

On the other hand, there were instances of important cables on the business of the Ministry being withheld by Messrs. Morgan, especially during the absence of Mr. Stettinius in England.

The conference between Mr. J. P. Morgan, Mr. Stettinius, and Mr. Moir, suggested by the Minister of Munitions, took place soon after the return of the two former to America, and the causes of friction were removed, Mr. Moir reporting on 31 March that the offices were working with great harmony.

(*d*) The British Munitions Board in May, 1916.

A sketch of the organisation of his department forwarded to the Minister of Munitions by Mr. Moir on 16 May, just before his return to England, shows that the Board then consisted of Mr. Moir as president, with General Minchin and Mr. Japp as vice-presidents, and a selection of the chief men in each department as a committee.[1] General Minchin was the head of the Quality Inspection Department, which controlled inspection, gave orders as to change of design, and regulated the technical side of the work, while Mr. Japp, the head of the Quantity Inspection Department, dealt with the pushing and forwarding of production and the payment of money spent by the department. The financial arrangements, which had been confirmed by Sir Frederick Black in consultation with the financial section of the Ministry of Munitions, were that Mr. Japp should draw against Messrs. Morgan for the bank account, and that he should sign cheques with the cashier, Mr. McLaughlin. The accounts were audited monthly by Messrs. Deloitte, Plender, & Griffiths, of New York.

Mr. Moir arranged that in his absence General Minchin and Mr. Japp should preside alternately at meetings, each for a fortnight at a time. The Board would meet from time to time at the discretion of the vice-presidents, jointly or separately, at long intervals. In addition there were a certain number of people who were prepared to act gratuitously (except as to actual travelling expenses) when called upon to do so—viz., Mr. Atha (who had been handling the large steel requirements), Messrs. Abbott, Worswick, and Platt.

The Minister of Munitions, who had felt some difficulty in allowing Mr. Moir to leave America, on the ground that his organisation contained a number of departments with separate heads, then withdrew his objections, being satisfied with the proposed Munitions Board, and Mr. Moir left New York on 29 May.

(*e*) Changes in Inspection Department.

The Military Inspection Department was strengthened by the arrival of additional officers in May, and General Minchin decided to draw up a monthly report on inspection to accompany the progress reports. In July Colonel Phipps, who had had charge of the Inspection

[1] A chart showing the organisation under Mr. Moir is given in Appendix V.

Department for 21 months, returned to England on sick leave. In September General Minchin accepted work in connection with the Russian Commission, which took up so much time that he resigned his position as vice-president of the Munitions Board, and in September it was decided that there should be a reversion to the closer association with the chief inspecting authorities in England existing before General Minchin's arrival in America. On 14 October General Minchin was directed to give all his time to the Anglo-Russian Committee, and Colonel Kenyon was appointed chief of the British Inspection Department soon afterwards. On 3 October Mr. Moir became Director-General of a new department dealing with the supply of railway materials, railway transport, optical munitions, and overseas transport, of which the American Branch of the Ministry formed a part.

III. General Contracts Policy.

Certain broad lines of policy had been laid down by Mr. D. A. Thomas in December, 1915, viz., that Canada should be given "a preference and more than a preference over the United States in the award of orders for munitions of war,"[1] contracts at higher prices being allowed within reasonable limits, and that it would be well "to refrain if possible from placing any further orders for munitions in the United States," the capacity of all suitable firms being already taken up and the financial situation making further large buying in the United States undesirable. Contracts for large shells from the United States were to be placed for a period of six months only, while Canadian orders ranged over twelve months. In reply to a cable from Mr. Moir on 10 January, 1916, asking for a forecast of the further requirements of the Ministry in the United States up to the end of 1916, the Minister reserved his final decision, but stated that it was not anticipated that fresh sources of supply in the United States would be required, and that the moment at which the supplies already arranged for should be cut off was being considered. The adoption of a very large gun ammunition programme in September, 1916, however, made the placing of large additional orders in the United States imperative.

On grounds of general policy Mr. Moir waived the cancellation of certain contracts, which he had a right to cancel through the firms being behindhand with their deliveries; the object of the Ministry being to induce firms to produce as much as possible, not to discourage them by threats of cancellation. It appeared undesirable to claim damages for breach of agreement, as the fact of cancellation was in itself a penalty.

He strongly condemned the system of making large payments on account, as it tended to extravagant equipment of factories with a lack of brain force to control them, and he thought that payments in advance should only be made against actual confirmed progress in

[1] See Vol. II., Part IV.

production. He advocated more orders for large calibre shell being placed with Canadian manufacturers, who had shown great capacity and did not demand large payments in advance, and drew the attention of the Ministry to the fact that the large orders for heavy shell placed in the United States in September would involve the purchase of new machine-tool equipment, the cost of which would be completely written off on the orders, but which would remain in the United States. It was unfortunate that these orders could not be placed in the United Kingdom or in Canada. The view of the Ministry was that some of the American orders would have to be continued during the period of the war, but that when the new orders placed in the United Kingdom and in Canada came into being the manufacturers in the United States who were giving the worst results would be stopped. The contracts for shells of small calibre were completed by October, 1916, and renewal orders were not placed in America.

IV. Efforts to Hasten Production.

In January, 1916, it was clear that the supply of munitions was very seriously delayed by the failure of the manufacturers to carry out their promises. Most of them had underestimated the difficulties of producing munitions (the only exceptions being those engaged on 18-pounder rounds and on explosives), and their inexperience led to technical difficulties of a kind which would not be met with in England. Mr. Moir reported, as examples of this, the fact that they found it difficult to turn out copper bands which would pass the required tests. Further, some of the contractors were delayed by the defaults of their sub-contractors, who were not properly followed up, others by taking on too much work for their plant, others by the delay in delivery of their machinery, many by bad organisation and general inexperience. On the other hand, American manufacturers had a reputation for keenness, and many of them insisted that their contracts would be completed up to time, in spite of the delay in beginning deliveries. Mr. Moir quoted a case where lathes were working twenty days after the ground was broken for the plant. Changes of design, which had been somewhat numerous, had also hampered production. Labour had been difficult, though on visiting factories there was evidence of strenuous personal effort, which was not, as in England, controlled by trade union regulations.

Some of the steps taken by Mr. Moir's organisation to try and hasten production have already been considered.[1] Further, he had a report on shell manufacture drawn up to indicate the best way of doing any and all operations, and advocated the installation of a "show" factory to demonstrate the best methods. In April, finding the plants of two large companies antiquated, and the management ignorant of the time taken over some of their operations, he drew up a special report to assist them. On the arrival of a shell programme in April he sent a revised and reduced estimate of probable output, based on a scheme

[1] See above, p. 45.

for estimating the capacity of factories in machine hours. This proved useful in pointing out to manufacturers cases where their equipment was unbalanced or uneconomical, or where it was impossible for their promises to be realised. It was found, for instance, that one experienced firm was taking 13 hours over an operation which ought to be done in 7½ hours, and it was arranged that the factories should be visited and operations checked up against a fair scheduled time. The right of visiting the works of sub-contractors only existed by courtesy, but they usually welcomed inspection, and it was hoped that these methods would increase the output, prospective profit and keenness of the firms employed. A statement of the times taken over various operations was sent to the Minister, hoping that he would compare it with the times taken in British factories.

The monthly progress reports, which contained the tabular statements of estimated and actual deliveries of all classes of munitions, showed a steady improvement of output which continued until the end of the year, the deliveries between June and December, 1916, being actually three per cent. in excess of estimates, as is shown by the following table[1]:—

DELIVERIES OF SHELLS FROM UNITED STATES, JUNE TO DECEMBER, 1916.

	Estimated Delivery.	Actual Delivery.
15-in. H.E.	2,350	1,869
12-in. H.E.	99,500	118,013
9·2 in. H.E.	634,192	641,972
8-in. H.E.	733,640	831,062
6-in. H.E.	1,270,450	1,154,253
60-pdr. H.E.	209,307	218,069
60-pdr. S.	414,520	525,808
4·7-in. H.E.	131,106	125,007
4·7-in. S.	76,118	66,639
Total of all types	3,571,183	3,682,692

Special efforts were made to accelerate the deliveries of guns, which were much delayed. The Bethlehem Steel Company found very great difficulty in production. A member of the Progress Department of Mr. Moir's organisation was installed in the works, and Mr. Ellis wrote to the company in August suggesting that they should send over to the Coventry factory some intelligent person with technical knowledge. No one could be spared to go to America, which Mr. Moir would have preferred as being quicker and less likely to give away trade secrets to a potential rival.

In the same way deliveries of shells were very disappointing during the first six months of 1916. All the experienced firms being engaged up to the limit of their capacity, Messrs. Morgan had introduced new firms to the industry, thereby securing a substantial reduction of prices, but these firms could not live up to their promises in the matter of early deliveries, as they had no means of estimating the difficulties incidental to the production of an unfamiliar article.

[1] HIST. REC./H./1000/5.

The shortage of deliveries of large shells in February, 1916, was serious, and in May the manufacturers were approximately three months behind, and were "all in the position that they were going to make things," while by October the deliveries of the heavier natures varied from 87·5 per cent. to 65·5 per cent. of the number promised. Deliveries of the smaller natures were much more satisfactory, and most of the contracts were completed in the autumn.

The following table shows the position of the orders for shell forgings :—

	Total Quantities on Order.	*Percentage actually manufactured of total due to 31 October, 1916.*
12-in.	85,000	90
9·2-in.	731,644	48·5
8-in.	642,022	84
6-in.	1,535,410	71·5
4·5-in.	1,207,273	96·5

The supply of fuses was in a very unsatisfactory state at the beginning of 1916. This was due, in Mr. Moir's opinion, to the fact that Messrs. Morgan had let the contracts to firms of inferior standing and capacity; two mushroom firms had taken on enormous orders for fuses, and up to 31 March they had produced nothing at all, having left the Ministry in the lurch with orders for 4,000,000 time fuses to place at a late date. Mr. Moir hoped that the deficiency would be made up before the end of the year by three other firms, one of whom had proved very successful, delivering its No. 85 fuses ahead of time.

During the next six months there was a great improvement, the following being a statement of the position at the end of October, 1916 :

	Total Quantities on order.	*Percentage actually manufactured of total due to 31 October, 1916.*
Fuse No. 101	6,361,000	64
100	14,122,779	100
85	15,200,000	83
44	500,000	100

The copper band situation, which was serious at the beginning of 1916, was made worse by the Canadians coming into the market with a large order. It remained unsatisfactory, and Mr. Moir warned the Ministry to this effect in May, his view being that Messrs. J. P. Morgan were not handling the situation successfully. There was considerable improvement, especially in the smaller natures, towards the end of the year, the situation on 31 October, 1916, being as follows :—

	Total Quantities on Order.	*Percentage actually manufactured of total due to 31 October, 1916.*
9·2-in.	200,000	17·5
8-in.	516,700	68
6-in.	2,240,244	41
60-pdr.	2,174,000	81
4·5-in.	1,817,350	95·5
18-pdr.	3,759,656	100

The explosives and propellant situation was more satisfactory. The bulk of the orders for explosives had been placed with the E. I. Dupont de Nemours Company, who had been remarkably successful in expanding their organisation to meet the huge demands placed upon them, Mr. D. A. Thomas reporting that there were few firms in the United States which had so nearly lived up to their promises.

The supplies of nitro-cellulose powder, of T.N.T, oleum and cordite are summarised in the following table, which shows a satisfactory state of affairs :—

	Total on Order.	Total manufactured in					Percentage actually manufactured of Total due to 31 Oct.
		June.	July.	August.	September.	October.	
	lbs.						
Nitro-Cellulose	126,272,783	7,163,960	5,593,586	5,721,568	4,158,911	7,736,775	106·5
Cordite	34,000,000	2,200,000	2,200,000	2,000,000	1,900,000	1,700,000	90
T.N.T.	24,042,500	238,300	202,900	254,800	350,000	1,950,640	109
Oleum	tons. 24,883	—	—	—	—	—	92

Only one firm was authorised by arrangement with Messrs. Vickers to manufacture Vickers guns in the United States. Before 5 July, 1915, orders had been given to this firm which would take up their full capacity, but in April, 1916, on Mr. Moir's advice, the orders were cancelled, as it appeared that though deliveries were due to begin in November, 1915, no guns could be obtained from this source before the end of 1916. The firm had obtained a payment in advance, had spent the money lavishly, but had not sufficient experience to carry through the work to the production stage.[1]

The Savage Arms Company had been authorised by the Armes Automatiques Lewis to make Lewis guns for the western hemisphere. The Canadian Government placed an order for 2,000 guns, and on completion of this contract the company started on an order for 10,000 guns for the British Government. Although they were late in beginning deliveries, the company eventually delivered guns at about 50 per cent. in excess of the contract rate.[2]

Mr. D. A. Thomas had reported in December, 1915, that the supply of rifles was the hardest problem that he had had to deal with. "There is no department of munitions production," he wrote, "in which experience is so necessary or equipment so difficult to obtain. On the other hand, there appears to be no other business so attractive to the irresponsible broker, and it would have been easy to have ordered on paper, by this time, enough rifles from the United States to re-equip the entire military forces of the world." This report was borne out by later experience. One great difficulty was the lack of skilled labour

[1] HIST. REC./H./1000/5.
[2] *Ibid.*

for assembling rifles, for stocking and straightening of barrels, and there were many complaints that a Canadian munitions firm took men from the United States rifle factories by advertisement and canvass. The labour laws prevented retaliation in kind by the United States manufacturers. Mr. Reavill, an expert from Enfield, gave his advice and assistance to the manufacturers, but the high standard of technical efficiency required by Major Smyth-Piggott, and afterwards by General Minchin, led to many complaints from the manufacturers. Mr. Moir, however, was satisfied that the standard required was not unnecessarily high. In May, 11,400 rifles were produced, and in June, 20,655. In July production increased rapidly, 18,000 rifles being produced in one week, but there were complaints that the quality of the rifles produced in America was unsatisfactory. Mr. Moir attributed this to the numerical weakness of the inspection staff, and urged also that some one in a responsible position at Enfield should be sent out to help the American manufacturers, who had never made rifles before. In August and September the situation became serious; over 200,000 rifles had been accepted and immense numbers more were coming through on a design, some of the details of which had to be modified. Sir E. Moir pointed out that the question of alteration would have to be delicately handled, since approval of the design fixed contract times, and so on.

Lieutenant-Colonel Webley Hope left England on 2 September to deal with the matter. As a result of the more stringent inspection required the August output of accepted rifles fell to 51,635. It was reported that the rifles, as produced, would function properly with some ammunition, but not with other, and they could not be issued to the troops. It appeared later that the trouble was mostly due to faulty design. The output fell to 25,571 in October, the manufacturers having practically suspended operations until some agreement should be reached. Lieutenant Colonel Byrne visited the United States on 21 October to help the manufacturers and standardise inspection, and by December an agreement with the manufacturers had been reached and they had resumed work, 48,246 rifles being accepted during the month. Originally 3,400,000 rifles had been ordered, but, owing to delay in delivery and to increased British production, the orders were reduced to 1,800,000 rifles.

In the same way the production of small arms ammunition was at first very disappointing. It had been estimated in July, 1915, that the orders then placed in America would be sufficient to meet future requirements, but in the later months of the year there were indications of a deficiency in supply and an increased demand.

In the spring of 1916 deliveries improved, but in August Sir E. Moir reported that all small arms ammunition—American as well as British—was being passed through the Inspection Department at Perivale, which involved great delay and expense. He thought the final inspection should be made in America, and if the American Inspection Department was not strong enough to deal with this, an effort should be made to strengthen it. In September and October deliveries of

52,754,000 and 55,000,000 rounds were made, and as the British demand was nearly satisfied, arrangements were made for the manufacturers to transfer their energies to making cartridges for Russia.

Machine tools were specially important, and the loss of the "Cymric" on 9 May was a very serious matter as there were nearly 14,000 cases of machine tools on board, many of which had taken over twelve months to manufacture. Mr. Fellowes, who had been sent out to expedite the delivery of machine tools for private owners, returned to England on 27 May.

The importance of the question of the supply of steel and the anticipated shortage were dwelt upon by Mr. D. A. Thomas, who in December, 1915, drew attention to the rise of prices, which was justified, he thought by the conditions of production. He criticised the embargo on the export of tungsten from India, and urged that the interests of American manufacturers should be considered when regulating the supply of tungsten and manganese.

Mr. Moir reported in April, 1916, that the large requirements for steel had made the placing of orders a delicate matter, in order to avoid a corner and the raising of prices. He thought that in view of the congested state of the market the matter had been well handled by Messrs. J. P. Morgan & Company. Mr. Atha had been sent out from England temporarily to advise as to quality. His rulings had aroused many questions at first, but by cabling direct to the Ministry, Mr. Moir got authority for Messrs. Morgan to close their contracts, as any hanging back or indecision was likely to be dangerous. He reported in September that the situation was serious in view of the large requirements of the Allies. The whole steel production of the United States up to the middle of 1917 had been more than bought up, and he urged that requirements up to the end of 1917 should be quickly settled and dealt with. In October, deliveries under existing contracts showed improvement, but the steel market was still very tight and the requirements of the Allies for 1917 had not yet been fully met.

Special attention was given to the purchase of brass, copper, and zinc urgently required for Munitions production in England. The aluminium position, which was very difficult in the autumn of 1915, half the world's output being manufactured in America by the American Aluminium Company and its Canadian subsidiary, the Northern Aluminium Company, was much improved by the placing of large contracts after long and delicate negotiations.[1]

V. Shipping and Weight Checking.

On Mr. Moir's arrival in the United States the shipping problem was a difficult one. He estimated, in February, 1916, that there would be over 90,000 tons of freight to remove monthly for some months

[1] See Vol. VII., Part III.

apart from the goods shipped by other Government Departments or Allied Governments. Messrs. Lunham & Moore were despatching more than 90 per cent. of the total from New York, and on 16 February the accumulated freight in New York amounted to 20,000 tons. The lack of shipping congested the railway traffic, and railway companies were refusing to allow material to be loaded for New York at the factories. In consequence, the goods could not be paid for, and the manufacturers slackened production.

Mr. Moir's department had only a courtesy right to criticise the shipping agents' arrangements, but he thought that the control of shipping was bad and that ports other than New York were not fully utilised. With a view to improving the position Mr. Moir formed a department under Mr. Karr to assist Messrs. Lunham & Moore and deal with the materials *en route* from the factories to the boats. The Minister of Munitions, in response to a cable, sent out Mr. Fellowes to work at the problem, and pressed the Admiralty to provide additional freight. By 31 March, more shipping had been placed at Messrs. Lunham & Moore's disposal, and the position had been improved. Mr. Fellowes visited all the ports on the Atlantic littoral with Mr. Karr in search of facilities for loading and handling munitions. This resulted in many ports in addition to New York being utilised ; the quantity of traffic passing through New York was immediately reduced to 40 per cent. of the total shipped, and the congestion at the port much eased.[1]

The Traffic Department also advised contractors as to the quickest and cheapest route for the despatch of their products. Anticipating a shortage of tonnage when the grain crops began to move to Europe, Mr. Moir had a conference with the Admiralty on 20 June, as a result of which Lieutenant (later Captain Sir) Connop Guthrie was sent to the United States to represent the Admiralty, with power to decide on the spot questions hitherto referred to England. He was allotted offices at 120, Broadway, in order to be in close touch with the Shipping Department of the Munitions Board. The new plan worked well, 131,000 tons of munitions being shipped in August, 132,000 tons in September, 138,431 tons in October, and 154,937 tons of munitions, together with 22,129 tons of oil and wax in November. The monthly tonnage despatched rose later (August, 1917) to 300,000 tons, but a much better distribution of freights over the different ports was reported.

In Mr. Moir's opinion the commission of 1½ per cent. paid to Messrs. Lunham & Moore was excessive (especially in view of the ever-rising freight rates) for the work actually done by them, and a new agreement was entered into by which the British Government agreed to pay 7½ cents per long ton for the first 50,000 tons placed in their hands at New York in any one month, and 5 cents per long ton on all excess beyond 50,000 tons in any such month. All tonnage placed in their hands at ports other than New York was to be paid for at the rate of 5 cents per ton.[2] The shipping agents continued their work on this basis until the end of the war.

---

[1] Hist. Rec./H./1000/5. [2] *Ibid.*

The Traffic Department worked very well, and there was no adverse criticism of its activities, either by the Admiralty or the Shipping Controller. Sir E. W. Moir therefore resisted the Shipping Controller's proposal (20 April, 1917) that his representative in America should take over the whole of the routing. This change, however, was decided upon, and in August, 1917, Sir Connop Guthrie was given entire charge of the Ministry of Munitions traffic in the United States.[1]

In April 1916, Mr. Moir drew the attention of the Minister and of Sir Frederick Black to the fact that materials bought by weight were not checked, the suppliers' invoices being accepted as correct, that there was no Government check on the quantities of goods arriving at American ports from inland, that the supervision of the goods being loaded on to the ships left much to be desired, and that the railway routing of goods was costing far more than was necessary. Messrs. J. P. Morgan & Company, and Messrs. Lunham & Moore both contended that the checking of quantities was not their business. A department to deal with this was instituted by Mr. Moir in June; it immediately discovered discrepancies, and he reported in August that it was doing good work. It checked the goods when they were loaded from the factory on to the railway, and again on being transferred from the railway cars at the port of shipment, and a further check was made when the goods were being placed on board ship.

A branch of the department was formed to give Messrs. Morgan details to enable them to make claims on contractors, railway and steamship companies for any shortages or damages which were found. This had not been done adequately before, the claims to February, 1916, amounting to $7,000 only.

The responsibility for protecting munitions factories in America from damage by enemy agents rested with the manufacturing contractors, whose precautions had been described as thorough and energetic by Mr. D. A. Thomas. In September, 1916, a department for watching and protecting the shipping of munitions was developed in close touch with the Secret Service Department of the Foreign Office in New York. Men were stationed at the points where loaded shell or explosives were handled. In November this force was placed under Mr. Gillan, who was sent out from Scotland Yard, the services of the Doherty Detective Agency appointed by Messrs. Morgan being dispensed with, a refund being made by the Agency to the British Government on account of overcharges in this respect.[2]

VI. Allied and Canadian Competition.

The necessity of having some controlling authority to regulate the purchase of munitions by all the Allied Governments in the United States market was obvious before the beginning of 1916; some

[1] See below p. 73. For this and other reasons Sir E. W. Moir resigned his connection with the American Branch in October, 1917.

[2] HIST. REC./H./1000/5.

steps had already been taken to reduce competition,[1] but no real solution of the question was reached until late in 1918, when the war was nearly over.[2] The difficulties caused by competitive buying were illustrated by Mr. D. A. Thomas when he reported that the Canadian Shell Committee had placed orders in the United States for graze fuses at double the price paid by Messrs. J. P. Morgan, without consulting Messrs. Morgan or the Ministry as to the market price. Other flagrant instances were the orders placed for Canada for copper driving bands in a very tight market, the " poaching " of labour in the United States rifle factories by a Canadian munition factory, and purchases of aluminium for Russian and Japanese fuse manufacturers. In February Mr. Flavelle (chairman of the Imperial Munitions Board of Canada) promised that no Canadian orders would be placed without consultation with Mr. Moir's department, while munitions purchased by Canada in the United States were to be inspected by the American Inspection Department.

Mr. Moir urged that purchases made in the United States for Russia by the British Government should be under the American Branch of the Ministry, and in this General Ellershaw concurred (February, 1916). The fact that Russia wished to place very large orders for railway material in the United States had been intimated by the Foreign Office in April, and on 10 June, 1916, the Russian Government decided that they were willing for their American orders for railway material to be placed through Messrs. J. P. Morgan in consultation with the Ministry of Munitions. Other requirements were being dealt with by the Anglo-Russian Commission, but it was suggested, in June or July, that Mr. Moir's department should take over the inspection for quality and progress of Russian munitions in the United States. Mr. Moir thought this inadvisable, on the ground that his department was not represented on the Anglo-Russian Commission, and that such an arrangement would lead to conflict with the Russian quality inspection department, and to international complications deprecated by the Foreign Office. By August it appeared to be settled that the department should confine itself to giving its views privately, when asked to do so, on the capacity of any specific factory, and that no attempt should be made to push production except at the special request of the Russian Government.

---

[1] See above, p. 37.
[2] See below, p. 70.

CHAPTER V.

ADMINISTRATIVE DEVELOPMENTS IN 1917 AND 1918.

I. Organisation at the Beginning of 1917.

At the beginning of 1917 the organisation of the Ministry in the United States was substantially the same as that which Sir E. Moir had left in May, 1916. Messrs. Morgan were still placing contracts and carrying on negotiations for supplies in accordance with the terms of the Commercial Agency Agreement. There remained an impression in England that the charges made by Messrs. Morgan for their services had become too large, but otherwise there was no dissatisfaction with their work. In the task of securing deliveries from contractors, Messrs. Morgan were assisted by the Progress Department, already described, which was under the control of Mr. (later Sir Henry) Japp; its functions were to watch, record and report the progress of supplies, to supervise the inland transport of munitions from factory to port, and to check quantities delivered from point to point.[1] The department also carried out inspection duties in respect of certain classes of goods.[2] The main work of inspection was under the control of Colonel Kenyon, who had recently succeeded General Minchin. There were also a number of independent inspectors in the country, who had been sent over to deal with specified types of munitions.

The entry of the United States into the war necessitated certain changes. The United States "became a fighting country as well as a producing one. In the former capacity they necessarily compete in their own markets with the Allies; and in the absence of specific arrangements, they inevitably obtain a priority, both of manufacture and transport."[3] Further, the demands of the United States constituted a factor which was certain to neutralise the tendency observable at the beginning of 1917 towards the centralisation in the hands of Great Britain of the purchase of war materials for the Allies in the United States.

The probability that changes in organisation would be necessary was early recognised by both Messrs. Morgan and the British Government. On 5 April, 1917, the Minister of Munitions discussed the question with the London branch of the firm. The decision as to the continuance of the Morgan Commercial Agency depended on the arrangements which might be necessary in order to secure for the British Government and its Allies the advantages arising out of any control of prices which the United States Government might institute. The Minister stated at the same time "that the British Government

---

[1] D.M.R.S./518 E.
[2] See below, p. 72.
[3] Memorandum by Mr. Balfour, July, 1917, pp. 7–8. D.M.R.S./518 B.1.

is considering intimating to U.S. Government at the proper moment and through the proper channel its desire to place at disposal of U.S. Government so far as possible the organisations which have been built up on its behalf in America, such as Col. Kenyon's Inspection Department and Sir E. W. Moir's Organisation." He raised the question as to the possible usefulness to the United States Government of the department created by Messrs. Morgan.[1] Two days later information was received that Messrs. Morgan had already offered their services to the United States Government.[2]

To investigate the new conditions that had arisen, and to carry out negotiations with the United States Government, a British Mission, under the leadership of Mr. Balfour, was sent in April to the United States. The Ministry of Munitions was represented on the Mission by Mr. W. T. Layton, assisted by Mr. C. J Phillips, Mr. M. S. Amos, and Captain Leeming.

The main problems in connection with munitions were summarised by Mr. Layton as follows :—

1. Advisory work in connection with the American programme, and the types of munitions to be adopted.
2. American supplies to the Allies—
   (*a*) Co-ordination of Allies' requirements and purchases in the United States—
      (i) Purchasing authority.
      (ii) Price control.
   (*b*) Protection of Allies' munitions supplies against competitive orders and shortage of labour and materials.
   (*c*) Nature and extent of assistance possible from America to the Allies, and especially Russia.
3. The representation of the Ministry of Munitions in America and the exchange of officers.[3]

The work of the Mission under the first head was purely advisory, and while its representations were considered by the United States Government, their weight being increased by the experience gained by the British in the field, the decisions of the Government were to some extent based on political grounds.

On the question of the system by which Allied purchases should be made in the United States no definite decision was reached. One possible solution—the purchase of all supplies for the Allies by the United States Government, had, as was set forth in the report issued by the Mission, certain advantages.

> "It would be the surest way of placing on the American Government the responsibility of securing deliveries and handling as a whole all questions of priority, etc., while it would be a simple

---

[1] L. 34537.
[2] N.Y. 41640.
[3] *Work of the British Mission to the United States*, June, 1917 (Hist. Rec./R./1141/39).

matter of negotiation to retain those firms which have proved their capacity to produce the special requirements of each Ally. But the organisation of Messrs. Morgan appears the only machinery available in America for handling so large a task, and political reasons prevent the absorption of the organisation as it stands. Tentative enquiries have been made unofficially with a view to absorbing part of the machinery in such a way as to avoid making it appear that the Government is relying on this firm in any way, but the difficulties appear so great that when the Mission was leaving Washington it seemed more feasible that the Allies should retain Morgan's Agency, and that Government control should be limited for the moment to a visa sufficient to enable the Treasury to justify Allied expenditure to Congress. This is however, rather a Treasury view, and it is realised at Washington that it would leave the Allies worse off than before America entered the war, since it gives no help to them in the matter of prices, and leaves them with the responsibility of getting deliveries, while it lays them open to the competition of the American munitions programme without establishing any means of co-ordinating the two sets of demands."[1]

The possibility of continuing the practice of placing British Government contracts through Messrs. Morgan was removed by the action taken by Messrs. Morgan themselves. In a cable dated 24 May, 1917, they stated that they proposed on the day following to hand to the British Ambassador a letter resigning their agency.[2] The reason given for their resignation was the change in conditions following the declaration of war by the United States.

"It appears obvious to us . . . that in the interest of the British Government its purchases for the future should be made by or in connection with the United States Government; indeed, it would seem that the procurement by the British Government of materials and supplies in this country has come to be a matter which can be dealt with satisfactorily through diplomatic channels only.

"Therefore, while we do so with extreme reluctance, in view of our anxiety to render every possible assistance to your Government, we feel constrained to suggest that the arrangement under which we have made purchases on behalf of the British Government be cancelled forthwith."

Messrs. Morgan stated, however, that if the procedure set forth in a memorandum on Allied purchasing, which Mr. Layton, Mr. Phillips and M. Tardieu were to discuss on the following day,[3] were adopted, they would be glad to continue to make purchases for the British Government if so desired.[4] Messrs. Morgan were not immediately

[1] HIST. REC./R./1141/39.
[2] N.Y. 45265.
[3] See below, p. 62.
[4] N.Y. 45265.

relieved of their agreement and they continued to act as purchasing agents until a Purchasing Department of the British War Mission was established. In view, however, of the decrease in their responsibilities after the appointment of the British War Mission, the original agreement was modified, after discussion with Sir Hardman Lever, and the rate of their commission was reduced to ½ per cent., this reduced rate to apply to all contracts becoming effective as and from 1 June, 1917.[1]

The urgency of deciding the method of purchase was further increased by the attitude taken by the United States Government on the subject of loans and credits to the Allies; it became necessary that some authority should be established to settle the relative importance of these requirements. To meet this difficulty the British Mission, in agreement with the French High Commission under M. Tardieu, drew up proposals for the establishment of an Allied Conference in London or Paris to consider the applications which the Allies proposed to make to the United States; the programmes approved of at the conference were to be submitted to the United States Government by a committee of the Allies at Washington. It was proposed at the same time that Allied purchases of munitions, other than raw materials, should be made through the existing agencies, contracts being notified to the United States Government, and the purchase of raw materials for the Allies should be made by the United States Government itself. The prices charged to the Allies for goods purchased by the United States Government were to be the same as those paid by the Government for its own purchases. Similar treatment would be accorded to the United States in its purchases in Allied countries. An American tribunal was to decide priority between the demands of the United States Government and those of the Allies. These proposals were to be submitted to the United States Government by M. Tardieu, either as a joint memorandum or from the French alone. No further action in this matter was taken before the British Mission left Washington.

With reference to the third problem—the representation of the Ministry in America—it was recommended to the Minister of Munitions that a representative of his Department should be stationed at Washington. The question of the exchange of experts between Great Britain and America was not decided. In this, as in all the other matters with which the Mission had to deal, the difficulty that had to be faced was "that the Mission arrived before the Administration had had time to organise any effective control of American industrial resources, or to make any adequate delegation of authority."[2]

The Mission was in Washington from 22 April to 24 May 1917. Mr. C. J. Phillips remained in America to continue the various negotiations pending with the United States Government as regards the supply of munitions.

---

[1] M.F./Gen./1486.
[2] HIST. REC./R./1141/39, p. 7.

II. The Appointment of Lord Northcliffe.

The main task on which Mr. C. J. Phillips was engaged after the departure of the other members of the British Mission was the conclusion of the arrangements regarding Allied purchasing. On 25 May a conference was held at the Treasury, Washington, at which Mr. McAdoo, the Secretary to the Treasury, and the Assistant-Secretary, Mr. Crosby, M. Tardieu and M. Debilly of the French High Commission, Sir Richard Crawford and Mr. C. J. Phillips were present.[1] The discussion was on the lines of the memorandum agreed upon by the French and British Missions. It was stated that the United States Government proposed to appoint a Commission "to arrange prices and to determine priority in manufacture, and inland transport, for the chief, and ultimately perhaps for all, munitions and materials purchased in U.S.A., whether by U.S. Government or by European Allies." Certain temporary arrangements were to be made, pending the appointment of this Commission. It was desired by the United States Government that an Inter-Allied Council should be established as early as possible. After further conferences more definite proposals were made as to the establishment of the Inter-Allied Council; these were cabled to the Ministry by Mr. Phillips on 4 June.[2] The negotiations regarding this machinery were prolonged by various difficulties. There was an impression in England that the addition of American delegates to the Commission Internationale de Ravitaillement was all that was necessary to meet the views of the United States Government, and this, together with the anxiety of the Chancellor of the Exchequer as to the working of the financial side of the proposed system,[3] increased the delay. The matter was, however, made urgent by the decision announced by Mr. McAdoo that the establishment of an Inter-Allied Council was an essential preliminary to the granting of any credits to the Allies beyond the month of July, 1917.[4]

In the meantime, in order to carry out the recommendation of the Mission that a representative of the Ministry should be stationed at Washington, Mr. C. B. Gordon (later Sir Charles Gordon), Vice-Chairman of the Imperial Munitions Board in Canada, was appointed to be in charge of all the organisations of the Ministry in the United States (2 June). Shortly afterwards, it was announced that it had been decided to send a Mission to the United States, known as the British War Mission, under Lord Northcliffe. The purpose of this Mission was:—

> "To co-ordinate and supervise the work of all the departmental missions in the United States, to prevent conflict of interests and loss of effort, to determine priority and to maintain friendly relations both with the Allied representatives in the United States and with the United States authorities themselves."[5]

---

[1] N.Y. 45434. [2] N.Y. 45514.
[3] F.O. Tel. No. 2134, 8 June, 1917 (HIST. REC./R./1141/50).
[4] D.M.R.S./518 E.
[5] L. 38332, 18 June, 1917.

Mr. Gordon was attached to Lord Northcliffe's Mission, and Mr. R. H. Brand, who had represented the Imperial Munitions Board at the Ministry in London, was appointed as his assistant. The Mission arrived in Washington on 18 June, 1917. The work of negotiation with the United States Government was from that date continued by Lord Northcliffe and Mr. Gordon. The latter established his headquarters at Washington, and, under directions from Lord Northcliffe, the office also became the headquarters of the British War Mission in Washington, Mr. Gordon being appointed Vice-Chairman of the Mission.

Lord Northcliffe remained in charge of the British War Mission until November, 1917, when he returned to England, Sir Frederick Black being placed in temporary charge of the Mission.[1] At the beginning of 1918, the Earl of Reading was appointed Ambassador Extraordinary and Plenipotentiary on Special Mission, and also High Commissioner in the United States. He arrived in the United States in February, 1918, and the British War Mission was subordinated to him, Sir Henry Babington Smith, the Assistant Commissioner, being placed in charge of it.

III. The Purchasing Agreement.

The negotiations regarding the establishment of an Inter-Allied Council continued for two months after the arrival of the British War Mission. Mr. McAdoo continued to press the matter. On 18 July he presented to Sir Cecil Spring Rice a note, which had been approved by the President, urging that a Council ought to be established in Europe to consider and report to a Purchasing Commission in America the Allied requirements from the United States of food and munitions. He stated further that the completion of such arrangements before 15 August was regarded " as a condition precedent to the determination after that date of any further loans or credit," an extension of fifteen days being thus granted. After some interchange of views the British Government agreed to the proposals thus formally set forth by Mr. McAdoo, and on 25 August Lord Northcliffe cabled to the Ministry that the agreement had been signed.

The title of the agreement was the " Anglo-American Agreement respecting a Purchasing Commission in the United States." [2] Primarily the British alone of the Allied Governments was concerned, but the change from the original proposals, in which stress was laid on the establishment of an Inter-Allied Council, was not so great as appears at first sight. Article 4 of the agreement ran as follows :—

> " Since other foreign Governments engaged in war with the enemies of the United States may have entered or may enter into similar arrangements with the Secretary of the Treasury, it is

[1] Washington Papers, 3–0–0/1. (These papers have been placed in the Archives Registry of the Ministry of Munitions.)

[2] See text in Appendix VI.

understood that all such Governments shall agree among themselves as to their several requirements and as to the priorities of delivery desired to be observed as between them in respect of matters of major importance. Such agreement may be arrived at by an Inter-Allied Council, sitting in Europe, or, pending the establishment of such Council, by representatives of the Allied Governments acting in the United States."

The agreement laid down that " all purchases in the United States of materials and supplies by or on behalf of the British Government " should be made through or with the approval or consent of the Commission. It was to be the duty of the Commission

" to use their best efforts to obtain offers of the materials and supplies . . . . shown to be required at the best obtainable prices and terms, of delivery and otherwise, and to submit the same to the . . . . person or persons representing the British Government, but it shall be no part of the duty of the Commission to prepare and sign contracts, or to supervise their execution, or to determine technical details, or to carry out the inspection of materials, all of which matters shall be the concern of the British Government."

This definition of functions made it clear that while the assistance rendered by the Commission might be of great value in the placing of contracts, it was none the less necessary to have some organisation in the United States to carry out the business hitherto executed by Messrs. J. P. Morgan, and also to represent the requirements of the British Government to the Purchasing Commission for their approval.

The Commission appointed consisted of three members of the War Industries Board, Mr. B. M. Baruch, Mr. R. S. Lovett, and Mr. R. S. Brookings. The expenses involved and the salaries of the Commissioners, which were not to amount to more than $150,000 per annum, were to be paid by the British Government. When arrangements of a similar nature had been concluded with other of the Allied Governments the expenses were to be borne by each Government in proportion to the value of the purchases made through the Commission.

IV. The Settlement of the Purchasing Authority.

(*a*) Transfer of Functions from Messrs. J. P. Morgan to the Purchasing Department.

The reorganisation of the business of the Ministry in America was delayed for some time, pending the conclusion of the Purchasing Agreement, but as soon as the Agreement had been concluded the work proceeded rapidly. The notice given by Messrs. Morgan of their desire to cancel the Commercial Agency Agreement was not immediately acted upon, although on 16 July[1] they again stated that

[1] N.Y. 47752.

they thought that their work should be transferred to a department of the Ministry. In a letter to Lord Northcliffe (12 July) the firm had suggested that they might continue to act as financial agents at a reduced commission of one-eighth of one per cent., a similar arrangement being made with the French Government, and this suggestion was ultimately adopted, being confirmed by the Treasury on 13 May, 1918.[1] The commission was to apply to contracts for munitions, foodstuffs, and other materials placed by the various purchasing Departments of the British Government, in respect of which detailed invoices were rendered to and verified by Messrs. J. P. Morgan & Company. The commission did not apply to the payments of large sums in round amounts (such as those for the Royal Commission on Wheat Supply, the Remount Commission, the British Inspection Account, or for Canada, when the payments were of the nature of Banking transfers and the firm was not concerned with detailed disbursements), nor to payments for sugar, for which the rate of commission was $\frac{1}{32}$ per cent., nor to payments on contracts already placed under the Commercial Agency Agreement.[2]

The Purchasing Department, which took over the bulk of Messrs. Morgan's work, was established at the end of August, Mr. J. W. Woods being appointed as Director of Purchases.

The functions of the new department did not entirely coincide with those originally exercised by Messrs. Morgan under the Commercial Agency Agreement, since the agents had, as early as April, 1915, resigned to Messrs. Lunham & Moore the task of facilitating "prompt shipment of goods, making all necessary arrangements within their power up to and including the actual shipment." The work transferred consisted in the placing of contracts and the transaction of the negotiations necessary before the contracts were placed, functions in connection with which Messrs. Morgan had undertaken "to secure for His Majesty's Government the most favourable terms as to quality, price, delivery, discounts and rebates," and "to aid and stimulate . . . sources of supply for the articles concerned." It was agreed that Messrs. Morgan should be empowered to make payments against all contracts placed by the Purchasing Department, and that the charge made by them for this service should be a commission of one-eighth of one per cent.[3]

The Purchasing Department was to begin its activities on 1 September, 1917. On 28 August, after an investigation of all the contracts pending, and those which had not proceeded further than the making of preliminary enquiries, they were divided into two groups: those that were to be completed by Messrs. Morgan, and those which were to come under the control of the new department.[4]

---

[1] M.F./Gen./1486.

[2] For further details see Treasury letter, 13 May, 1918. 18462/18 in M.F./Gen./1486.

[3] F.O. Tel. No. 2457 (R.)(A.B./Gen./29).

[4] N.Y. 49999.

The conclusion of the Purchasing Agreement with the United States Government transferred new functions to the authority charged with the duty of placing British contracts. The procedure made necessary by that agreement was firstly, the notification to the Purchasing Department of the requirements of the Ministry and other Departments at home; secondly, the forwarding of these requirements to Sir Charles Gordon's office at Washington; thirdly, the submission of particulars to the Purchasing Commission; and, finally, the communication of the decision of the Purchasing Commission to the Purchasing Department by the Washington Office.

(*b*) INTER-ALLIED ORGANISATION.[1]

The procedure which has just been outlined was only part of the routine through which the orders passed. As has been seen, the Purchasing Agreement provided that the requirements of the Allies should first be approved by representatives of all the Allied Governments concerned; the most convenient form by which this approval might be obtained was submission to an Inter-Allied Council of the type suggested during the negotiations which led to the Purchasing Agreement. After the lapse of some weeks an Inter-Allied Council was established, and its first session was held on 13 December, 1917. Its title was the Inter-Ally Council on War Purchases and Finance. According to the constitution adopted at a meeting on 25 March, 1918, the Council was founded

> "for the purpose of addressing, from time to time, to the Government of the United States recommendations as to the commodities and credits in the United States desired for the prosecution of the war by the European Allied Governments, and, in a general way, for the purpose of studying and recommending to the interested Governments solutions of the economic and financial problems arising out of the purchases of the Allied Governments both in the United States and in the neutral countries." [2]

The chairman of the Council was appointed by the United States; the other permanent members were representatives of Great Britain, France, and Italy, other Allied Powers having the right to present their requirements to the Council for its sanction and support. The decisions of the Council took the form of advice to the Governments concerned, but the chairman was in a position to ensure that its recommendations were not disregarded. In June, 1918, for example, complaint was made by the United States Government to the representatives of the Ministry to the United States that certain demands which had been put forward had not previously been considered by the Inter-Ally Council.[3] When the Inter-Ally Council was formed a British-American Board was created to deal with the demands to be placed before the Inter-Ally Council. It consisted of representatives of the Treasury, the Foreign Office, the Admiralty, the War Office, the Board of Trade, the Ministry of Food and the Ministry of Munitions, and was under the chairmanship of Mr. Austen Chamberlain.

---

[1] See also Vol. II, Part VIII, [2] HIST. REC./R./1010/23. [3] A.B./Gen./81.

In June, 1918, it was thought necessary to establish an inter-Allied organisation to deal with munitions alone, the practice of the Inter-Ally Council on War Purchases and Finance being to lay down general lines of policy rather than to enquire into the details of the requirements submitted. There was formed, therefore, the Inter-Allied Munitions Council, consisting of representatives of France, Great Britain, Italy, and the United States. One of the objects of the Council was to consider the "allocation and transport of raw material for munitions to the various Allied countries." It was responsible to and reported to the Inter-Ally Council for War Purchases and Finance, and it received reports from the various committees already in existence for dealing with specific classes of munitions.

(c) Sub-Contractors and Agents.

By the terms of the Purchasing Agreement the British Government undertook to make purchases in the United States only "through or with the approval or consent of the Commission." This undertaking was generally complied with in the case of orders placed directly on behalf of Government Departments through the adoption of the procedure outlined above. There were, however, occasional deviations from it down to December, 1917.[1] Mr. Brand in his report for November, 1917, stated that there had been great difficulties owing to the tendency on the part of the Departments at home to purchase through agents in England instead of through the Purchasing Department in the United States.

> "Except it be in pursuance of a general plan agreed to by the United States Purchasing Commission, it is absolutely essential that we should carry out our obligations under the McAdoo agreement and make all our purchases through or with the consent of the United States Purchasing Commission. . . . We have made it a rule ourselves in every case to follow the McAdoo agreement and to give United States authorities the fullest possible information about our purchases. . . . Perhaps we have found most difficulty of all in connection with timber, both for aeroplane supplies and for Admiralty and Board of Trade purposes. Our purchases have undoubtedly been retarded by the failure of these Departments to prevent orders being placed through agents, sometimes at extravagant prices. These orders immediately conflict with the control over the whole timber trade now possessed by the War Industries Board, and consequently create a great deal of trouble. We have recently been informed, however, that all further purchases of timber of every kind will be made through us."[2]

Greater difficulties arose in consequence of the lack of machinery for supervising orders placed without reference to the Purchasing Commission, by private firms engaged on sub-contracts for the Government.

---

[1] L. 46586.
[2] Report dated 1 January, 1918 (A.B./Gen./81).

The most important class of goods imported in this way was machine tools. The possible results that might arise from the unofficial character of these orders were shown by a report in July that the United States authorities had requisitioned machine tools which were on order for the requirements of the British Government through licensed British importers.[1] The whole question was raised by the Purchasing Department on 5 September, 1917, in a cable to the Ministry.[2] In the following month, when Sir Charles Gordon arrived in London on a visit, the position had become more serious. Mr. Brand cabled on 12 November[3] that owing to the enormous quantities of machine tools required by the United States Government and their contractors, the Priority Board were issuing class A1 priority certificates to all machine tool manufacturers for United States Government orders; these certificates giving them preference over all other requirements, including British, French, and Italian orders.

Conferences were held on 15 and 16 November, as a result of which a cable was sent to Mr. Brand on 16 November [4] explaining the safeguards already in operation, and those it was proposed to institute in connection with the purchase of machine tools. Already all the orders for American machine tools were placed by importers licensed by the British Government: it was proposed to take immediate steps to limit the orders placed by licensed importers to a maximum of $1,000,000 per month. The British War Mission undertook to recommend the approval of this measure to the United States Government.

Machine tools were not the only class of munitions for which orders were placed independently of the Purchasing Department.[5] Steel and other metals were also being ordered by contractors independently and, on 4 December, a committee met to consider the procedure in relation to all these goods.[6] It was decided (11 December) that all orders for steel and ferro-silicon should be placed through the Purchasing Department. The case of small tools might be dealt with in the same way as machine tools, if this method met with the approval of the United States authorities; this might also be arranged for agricultural machinery and mechanical transport. In the case of aeronautical supplies, arrangements were being made for all orders to be notified to the Aeronautical Supplies Department. For lubricating oil alone it was thought that no special procedure was necessary. The United States Government, however, declared themselves still dissatisfied by the proposed arrangement for limiting the demands for machine tools, and suggested that all purchases by contractors should be preceded by application to the United States Purchasing Commission by the British War Mission, as in the case of Government orders.[7] It was finally decided that all orders placed after 1 January, 1918, should conform to the new regulation.[8] From that time all

[1] L. 38981.
[2] N.Y. 51183.
[3] N.Y. 55459.
[4] L. 44796.
[5] N.Y. 55883,
[6] L. 46497.
[7] M.C./147.
[8] N.Y. 61602.

orders for machine tools in America had first to be approved by the Ministry of Munitions at home; particulars were then cabled to the British War Mission, in order that the necessary permission to purchase and priority rating might be obtained.

The question was even then not settled. On 5 February, 1918, Sir Charles Gordon reported [1] that orders for machine tools continued to be placed by agents in England direct with firms in America without the knowledge of the British War Mission. The whole question of private purchase was becoming serious, owing to transport difficulties; there were large accumulations of goods in the United States, purchased by Allied Governments or by private persons, which could not be shipped. On 16 February, the War Industries Board stated that "a great many purchases continue to be made in U.S.A. without being submitted to U.S. Purchasing Commission for approval,"[2] and action was taken to prevent the continuance of this by the refusal of priority for orders placed in this way after 1 January.[3] The Board proposed to make it compulsory, as from 1 March, 1918, for all purchases, whether for Government or private use, to be submitted to the Purchasing Commission for approval. A cable from Lord Reading, dated 19 February, 1918, gave further details as to the War Trade Board's proposals.

> "Before any order is placed in the United States by any individual or firm in France, Great Britain, Italy, Belgium or Serbia (other than direct Government purchases made through the respective Allied War Missions in the United States) application will first be made to the import licensing authority in the respective country for licence to import. Negotiations, however, may be conducted by the individual or firm, either before or after applying for the import licence; after the import licence is granted the order will then be cabled by the Allied Government to its War Mission in the United States and submitted to the United States Purchasing Commission for their approval. The Purchasing Commission will take into consideration the available supply of the material desired and the position with regard to the shipment of goods already purchased by that Ally. If approved, the application will be returned to the War Mission in question, together with Purchasing Commission's number. The order may then be placed by purchaser with the manufacturer or producer in the United States."[4]

In view of the enormous increase of work which would fall on the Ministry's representatives in America if this plan were adopted, Lord Reading suggested an alternative procedure by which the British importer, after obtaining the import licence from the Imports Restriction Committee, should cable to the exporter in the United States the necessary information with regard to the purchase; the exporter was then to apply to the United States Purchasing Commission and

---

[1] N.Y. 61881.
[2] N.Y. 63398.
[3] N.Y. 63651.
[4] Hist. Rec./R./1141/21.

cable the result to the importer in England. Under this system the War Mission was to be called upon for advice only in case of difficulty. The United States Government agreed to give Lord Reading's method a trial, but later, however, found it necessary to issue regulations embodying the principles suggested by the War Trade Board in February. The new regulations, which were to be effective as from 15 May, 1918, required that an export licence should be obtained with the approval of the British War Mission from the United States War Trade Board, before application for permission to place the contract was made. The regulations made it necessary for the following procedure to be adopted.

1. An import licence had to be obtained from the Board of Trade, on the recommendation of the Ministry of Munitions.

2. The approval of the Department of the Ministry interested in the commodity had to be obtained for the provisional orders.

3. Details of the provisional orders had to be sent to the Purchasing Department, British War Mission. The importer was informed that this had been done and was then at liberty to inform the United States manufacturer that application for permission to purchase was being made.

4. The British War Mission had to apply to the United States authorities for approval, notifying the Department of the Ministry concerned of the decision. The importer was informed of the result of the application, and was then at liberty to communicate the information to the United States manufacturer. The latter obtained confirmation of the decision from the British War Mission.

From the operation of these regulations certain exceptions were made. In the cases of cotton and tobacco, for instance, a general permit was granted covering a given tonnage per month.[1]

It was stated that these regulations would be strictly enforced from 1 July, but on 12 August the procedure was again changed in order to reduce the work falling on the War Mission. The applications for permission to export, instead of being sent to the British War Mission, were to be sent direct to the War Trade Board, who would refer it to the British War Mission. Permission to place the contract was to be obtained by the War Trade Board [2] before the export licence was issued.

It was intended at first that payments against purchases made by private importers should be made out of the dollar credits granted by the United States Government. The desirability of this was stated by the Treasury in a letter dated 12 October, 1917,[3] but there was considerable opposition to the proposal and the Treasury finally agreed that payments for such orders might be left on the exchange.[4]

---

[1] (*Printed*) *Weekly Report*, No. 146, XII (15 June, 1918).
[2] (*Printed*) *Weekly Report*, No. 166, X (A) (2 November, 1918).
[3] M.C./147.
[4] (*Printed*) *Weekly Report*, No. 164, X (A) (19 October, 1918).

(*d*) ORGANISATION OF THE PURCHASING DEPARTMENT.

During 1918 the Purchasing Department was organised as follows, in a number of sections, each under the control of an officer of the department :—

Section.	*Officer in Charge.*
A. Raw Metals, Chemicals	Mr. A. J. McCormell.
B. Locomotives, Agricultural and General Machinery	Mr. W. M. McCutcheon.
C. Scientific Instruments and Materials therefor, Fuzes, Machine Guns ..	Mr. A. W. Manton.
D. Aeroplanes and Appurtenances, Aeroplane Lumber, Electrical Equipments	Capt. G. Sykes.
E. Oils, Miscellaneous Supplies	Major W. J. McNab.
F. Legal	Mr. L. S. Olds.
G. Statistics	Mr. E. S. Toghill.
H. Contracts	Mr. H. W. Hillman.
J. Mechanical Transport and Mechanical Warfare	Major B. C. Crossley.
K. Wood Distillation Products	Mr. P. J. Blackstone.
L. Dunnage	Mr. W. A. Scott.
M. Steel and Iron Shell	Mr. W. Swaine.
O. Other Equipment	Lt. C. Claxton.

V. The Production Department.

(*a*) RE-ORGANISATION IN 1917.

Upon the arrival of Sir Charles Gordon the responsibility for the Production Department (hitherto known as the Progress Department) was transferred to him from Sir Ernest Moir. The department continued under the control of Mr. Henry Japp, and the offices were still at 120, Broadway, New York. The work of the department remained as before "to accelerate output, to assist the contractors to overcome their difficulties as far as possible, and to forecast the probable future deliveries."[1] The department was responsible also for the distribution of cables to and from the Ministry transmitted by Messrs. J. P. Morgan, for the compilation of reports required not only by the Ministry in London but by the headquarters office at Washington, and the Purchasing Department. It was responsible also for checking the weight of munitions delivered at various points; a part of the work was taken over later by the Inspection Department. In the early part of 1917 this department also controlled a section dealing with the inspection of machinery. A year previously the machinery inspection staff had been independent of both the Inspection Department and Sir Ernest Moir's Organisation.[2]

---

[1] *British War Mission in the United States of America*, p. 10 (HIST. REC./H./1141/7).

[2] Inspection of Munitions, Col. Kenyon's Memoranda, etc., Washington Papers, 3–20–1, 5/20.

A new function was added to the department on the institution of the new arrangements in connection with British purchasing, when it became necessary for priority certificates to be obtained in respect of all orders placed. The department was charged with the duty of making out all applications to the Priorities Committee in Washington for principal priority certificates,[1] and of endorsing and forwarding to the Washington office the application for subsidiary priority certificates received from the contractors.

(*b*) TRANSFER OF THE TRAFFIC DEPARTMENT.

At the same time also the department lost one of its sub-sections—the Traffic Department. Sir Ernest Moir had created this department " to keep in touch with supplies from the time they leave the factories until they reach the boats on which they are to go to Europe," [2] and secured the services of Mr. E. J. Karr, of the Pennsylvania Railway, to take charge of it. The department was attached to the Progress Department, and had continued its functions successfully down to May, 1917. During the stay of Mr. Balfour's Mission in the United States the establishment of an Inter-Allied Executive to control transport for all the Allies was suggested, and it was proposed that Captain Connop Guthrie, who was at that time in charge of the shipping of British supplies, should be appointed as chief of the new organisation. It was suggested also that he should take over from the Production Department the responsibility for internal transport. This proposal met with some criticism at first. It was thought that it was essential for the Ministry to retain control over the routing of munitions. Difficulty also arose because M. Tardieu desired the appointment of a Frenchman as Chairman of the Executive. It was, however, arranged in June that a Traffic Executive Directorate should be established, with M. Sevel as Chairman and Captain Guthrie as Director-General. In this capacity Captain Guthrie had executive control.[3] Shortly afterwards the opposition to the transfer of the control of inland transport was also overcome, and it was arranged that as from 22 August the Traffic Department, under Mr. Karr, should be transferred to the control of Captain Guthrie, the terms of the transfer being set out in an Agreement (20 August) between the British Ministry of Shipping and the British Ministry of Munitions of War and the United States. It was provided that the Traffic Department should continue to assist the Ministry of Munitions in pushing forward urgent deliveries, that it should continue to inform the Ministry of Munitions as to the storage of commodities, and that the Ministry of Munitions should continue to give to the Traffic Department estimates of the tonnage of munitions to be shipped from the factories. It was decided also that the question of advanced payments to manufacturers on munitions waiting unduly for steamship space, and, for the time being, that of special bills for storage, etc., would continue to be referred to the Ministry of Munitions.[4]

---

[1] Report of Production Department, 12 November, 1917 (A.B./Gen./81).
[2] Report dated 4 March, 1916 (HIST. REC./R./1141/7).
[3] F.O. Tel. No./1729 (HIST. REC./R./1141/50).
[4] Memo. of Agreement, 20 August, 1917, Washington Papers, 3–20–1 4/6.

(c) The Organisation in 1918.

The Production Department during 1918 was organised into the following sections:—

Section.	*Officer in Charge.*
1. Production of forgings, shell steel, shells, ships' plates, barbed wire, mild steel rods, howitzers and field guns, testing machines, agricultural machinery, etc.	Mr. W. de B. Whyte, *Deputy Director.*
2. Production of rifles, fuzes, metals, explosives, etc.	Lt. E. G. B. Willmer.
3. Production of machine tools, locomotives, etc.	Mr. E. C. Poultney.
4. Priority certificates and applications to purchase in connection with machine tools ..	Mr. W. J. Seig.
5. Special accountant adjustor in connection with munitions and other supplies, taken over by United States Government.. ..	Mr. T. Cureton.
6. Office management, etc.	Mr. W. G. McLaughlin.
7. Imprest accounts	Mr. J. G. O'Keefe.
8. Progress diagrams and tonnage statement ..	Mr. E. F. Houghton.
9. Progress reports and financial and statistical statements	Mr. W. E. Freese.

In March, 1918, Mr. Gerald M. Browne arrived in the United States as representative of the Central Stores Department of the Ministry. He took up functions of a similar nature in the United States and was attached to the Production Department, attending to the verification and stores accounting of the actual deliveries made. The department was known as the Production and Stores Department from July onwards.[1] Shipping documents for the Ministry, Admiralty, Ministry of Shipping, India Office, Stationery Office, New Zealand Government, etc., were transmitted through this department.

VI. The Inspection Department.

On the arrival of Sir Charles Gordon the Inspection Department was attached to the British War Mission and placed under his control. At this time the work of the department was organised in sections, comprising the six main districts of general munitions inspection and three specialised sections concerned with aeroplanes, mechanical transport and gauges. The responsibility of Colonel Kenyon in connection with the mechanical transport section was confined to administrative and disciplinary work. On matters of a technical nature the section was directly under the Mechanical Transport Supply and Inspection Section of the Ministry of Munitions in London. The position of the Aeroplane Inspection Branch was, as Colonel Kenyon stated, "exceedingly ill-defined."[2] There was, further, a staff engaged on small arms inspection which was in no way responsible to him.

---

[1] See N.Y. 77172, 79335. Letter from Mr. C. F. Whigham, 11 September (M.F./Gen./1486). L. 60949.

[2] Report dated 13 June, 1917 (Washington Papers, 3–20–1, 5/20).

Upon the arrival of Sir Charles Gordon, a more definite organisation was established. Before he left England it was decided[1] that Colonel Kenyon " should become responsible for inspection of aeroplanes and engines in America (U.S.A.), choosing from the officers already sent out to America for this work." [2] This change was carried out, and by the end of September the Aeronautical Section was established, with its headquarters at Buffalo, under Captain Rogers. With the approval of the Ministry, Colonel Kenyon arranged with the United States Aeronautical Inspection that the headquarters at Buffalo should be a joint American and British organisation, the staff being partly British and partly American.[3] There were also three sub-districts responsible to Captain Rogers.

Another change in the direction of co-ordination under Colonel Kenyon was the addition to his department of " a good deal of miscellaneous inspection work which was formerly done by isolated individuals sent out here by the different sections of the Ministry." [4] It would appear that the Small Arms Section was included in this description ; at any rate, by 31 October, 1917, the small arms inspection was a branch of Colonel Kenyon's department.

The relations of the Mechanical Transport Department with Colonel Kenyon remained unchanged, and the officer in charge, Major P. C. Cannon, continued to send home reports independent of those of Colonel Kenyon.

VII. The Department of Aeronautical Supplies.

Although the control of Colonel Kenyon over the Aeronautical Inspection Section was established at this time, he took charge of only a part of the staff then in the United States in connection with aeronautical supplies. The work hitherto done by the staff was divided into two branches, one to deal with inspection and one with supply, the latter being established at Washington, under Lieut.-Commander B. O. Jenkins, in July, 1917. In August, Brigadier-General J. P. Cormack[5] was sent out to take the place of Lieut.-Commander Jenkins, and he was appointed by the Air Board as its representative in the United States.

Difficulties arose as to the division of duties between General Cormack and Colonel Kenyon, and the relations between the two organisations. General Cormack was of opinion that the chief aeronautical inspector, Captain Rogers, should report direct to him, and not through Colonel Kenyon ;[6] the result of this would be that aeronautical inspection would cease to be under the Director-General of Inspection and would be attached to the Department of Aeronautical Supplies. This raised an important question of principle, and, after

[1] 7 July, 1917.
[2] Washington Papers, 3–21–1, 5/13.
[3] Report dated 10 December, 1917 (A.B./Gen./81).
[4] *Ibid.*
[5] L. 46780.
[6] Letter to Mr. Brand, 12 November, 1917 (Washington Papers, 3–20–1, 5/13).

considerable negotiation, the matter was referred to the Ministry of Munitions in London;[1] on 15 February, 1918, a reply was received from Sir William Weir to the effect that the system of aeronautical inspection should remain unchanged.[2]

The Aeronautical Supply Department acted in conjunction with the Purchasing Department in the placing of contracts. The former department usually conducted the preliminary negotiations, the latter department being concerned in the actual drawing up of the contract, and the Aeronautical Supply Department carried out in respect of aircraft the "follow-up" work usually performed by the Production Department.[3]

VIII. The Headquarters Office at Washington.

In addition to these various departments there was now the headquarters staff, under Sir Charles Gordon and Mr. R. H. Brand, at Washington. Mr. Brand, on 1 January, 1918, gave the following account of the work on which the headquarters staff was engaged:—

> "The headquarters at Washington, broadly speaking, are responsible for any general policy in connection with the Ministry in the United States, and all matters of importance are submitted to it for decision by the Purchasing, Production and Inspection Departments, and also by General Cormack's Department . . . It is, furthermore, in the closest touch with the shipping and financial representatives of the British Government. . . .
>
> The necessity of obtaining, in the case of every purchase, or even enquiry to purchase, first, the approval of the United States Purchasing Commission, then the necessary priority order from the Priorities Committee, and then the export licenses, entails a great deal of work, both for the Purchasing Department in New York and for the Ministry's organisation in Washington. . . . The ordinary work, however, of obtaining purchasing approval, priority orders and export licenses is now going quite smoothly and satisfactorily. We have had to obtain priority orders for practically all the Ministry's uncompleted orders, and, at the present time, as new orders are placed applications for priority are also made. These applications . . . are . . . sent to the Priorities Committee and followed up until a definite decision has been given. In addition to the Ministry's work, the Priority Department of our office also looks after priority applications for all other departments of the British Government and for the Overseas Dominions. These applications are rapidly increasing in number. The largest number, as is natural, originate from Canada, but we are getting daily applications also from Australia, New Zealand and South Africa."[4]

---

[1] Letter dated 11 December, 1917 (Washington Papers, 3–20–1, 5/13).

[2] Letter dated 23 January, 1917 (Washington Papers, 3–20–1, 5/13).

[3] This arrangement reproduced in America the relationship existing between the Contracts Department of the Ministry and some of the big supply departments.

[4] Headquarters Report, November, 1917 (A.B./Gen./81).

In May, 1918, it was thought desirable to draw the headquarters staff at Washington and the various departments in New York and elsewhere more closely together, by the institution of a department of which all these should be sections. The name adopted was the Department of War Supplies. The headquarters of the new department was at Washington, taking over the old headquarters staff. Sir Charles Gordon received the additional title of Director-General of War Supplies, Mr. Brand was Deputy Director-General, and Mr. T. P. Howard became Deputy Director of War Supplies, with four assistants In July, 1918, Mr. C. F. Whigham, of Messrs. Morgan, Grenfell & Company, London, was appointed Deputy Director-General, *vice* Mr. Brand, who had returned to England in April.

In July, 1918, Sir Charles Gordon found it necessary, owing to the regulations issued by the United States Government as to purchases by private firms, to institute a special branch to deal with the export licences required for such orders. The offices of the branch were in the War Trade Board Building. In June, 1918, 3,050 applications in respect of such orders were approved, in July there were 4,021, and in August, 4,016.

The Department of War Supplies included, besides the headquarters staff at Washington, and the Production, Inspection and Purchasing Departments and the Department of Aeronautical Supplies, a number of other organisations or sections of which some description must be given :—the British Artillery Mission, the Gas Warfare Mission, the Department of Timber Supplies, the Mechanical Warfare Department, and the Anglo-Russian Sub-Committee.

IX. Other Organisations under the Department of War Supplies.

(*a*) The British Artillery Mission.

The advantage of having British experts on ordnance and artillery in America was recognised by Sir Charles Gordon.[1] It had already been decided that Major-General J. Headlam should proceed to the United States as head of an Artillery Mission to be attached to the organisation of the Ministry, and when the Department of War Supplies was formed the Artillery Mission became one of its sections.

On his arrival in Washington in February, 1918, General Headlam secured offices in the building occupied by the Chief of Ordnance. He was assisted by Lieut.-Colonel W. C. Symon, and the British officers who were already in the United States, acting as advisers to various branches of the United States War Department, were attached to General Headlam's Mission.

[1] Report dated 18 January, 1918 (A.B./Gen./81).

The function of the Mission was to give assistance and advice to the United States authorities whenever such assistance and advice should be sought. The presence of the officers of the Mission in close proximity to those of the Chief of Ordnance greatly facilitated informal discussions. It was the policy of General Headlam and his staff, also, to make tours of inspection to artillery headquarters, arsenals, etc., for the purpose of observing the methods and practices in existence, and of giving any information for which they might be asked. Care was taken from the beginning that the French Mission should have no cause to suspect that General Headlam was encroaching on the sphere of training.

On 1 August, 1918, Major Douglas Paige joined the Artillery Mission, to assist in matters connected with gun ammunition, and on 28 October Lieut.-Colonel H. G. Fitzgerald Hay was attached to the Mission for the purpose of advising on the subject of gun ammunition filling plants.

(*b*) The Gas Warfare Mission.

In September, 1917, Captain H. W. Dudley arrived in the United States to give information on the subject of anti-gas work. He was followed by Major S. J. M. Auld, who fulfilled similar functions with regard to gas offence, and by Major H. R. Le Sueur, whose function was to advise the United States authorities as to carrying out experiments in gas warfare. In November, 1918, these officers were organised as a Gas Warfare Mission attached as a section of the Department of War Supplies.

(*c*) The Department of Timber Supplies.

The purchase of timber in the United States during the first six months after the arrival of the British War Mission was undertaken partly by the Purchasing Department and partly by officers independent of the organisation of the Ministry. In January, 1918, it was decided that the Purchasing Department should for the future make all purchases of timber, and a representative of the Timber Controller was appointed to assist in all matters connected with timber purchases. It was arranged that he should be responsible to the representative of the Minister of Munitions, and on the formation of the Department of War Supplies the Department of Timber Supplies became attached thereto.

(*d*) The Mechanical Warfare Department.

In October, 1918, Major N. E. Holden arrived in Washington to establish a section of the Department of War Supplies to deal with work arising from the establishment of the Anglo-American Tank Commission. The department had only just been organised at the date of the Armistice.

(e) The Anglo-Russian Sub-Committee.

Another section of the Department of War Supplies was the British part of the Anglo-Russian Sub-Committee. This Committee had been established in July, 1916, to deal with contracts placed on behalf of Russia in the United States. After the Russian Revolution, the Committee continued operations for the purpose of carrying to a conclusion negotiations arising from the contracts that had been placed.

X. Auditing and Accounting.

From 1 July, 1918, the Commercial Agency Account was reconstructed and all payments other than purely Treasury expenditure were made from it. The Account was sub-divided so as to show the departments on behalf of which payment was made, and each department appointed a representative with power to instruct Messrs. Morgan to make payments on its contracts, and to give general instructions to the firm with regard to its contracts, and all questions arising in connection with them.[1] The previous sanction of the Treasury was required for any increase of price to be paid under a contract, for the acceptance of a dividend in bankruptcy in the event of a contractor becoming bankrupt, and so on.

In the summer of 1918 various circumstances—the change in the relations of the firm with the British Government,[2] the necessity of storing goods in America instead of making delivery from contractors into ships for conveyance to the United Kingdom—combined to make it desirable to institute an audit of Messrs. Morgan's accounts in America, in order that an adequate check might be maintained over deliveries. Lieut. John Armour, an officer of the Finance Department of the Ministry, was stationed in New York to carry out an audit of schedules and vouchers rendered by Messrs. J. P. Morgan, and to secure adequate stores charges from the Stores Officer of the Ministry.[3] Lieut. Armour was later empowered to act on behalf of other Government Departments.[4] The arrangement was not, however, very successful, and at the beginning of November it was decided to recall him and perform the audit, as before, in England.[5]

---

[1] Cables L. 54039 (8 April), N.Y. 69198 (11 April), Treasury letter 13 May, 1918 (M.F./Gen./1486).

[2] The firm pointed out that its functions should properly be limited to effecting payments and accounting therefor (N.Y. 79458, 25 July, 1918), but as there was some doubt whether the U.S.A. contractors would send punctual and accurate invoices to any organisation except that from which they obtained payment on such invoices, Messrs. Morgan agreed to continue to act as a distributing channel (N.Y. 79762, 2 August, 1918).

[3] 3 June, 1918. M.F./Gen./1486. N.Y. 77226 (27 June, 1918), 77248, 80013.

[4] M.F./Gen./1486. Treasury letter, 16 November, 42667/18.

[5] Cables 3 November, 18 November, 10 December, 19 December, 1918, 6 January, 17 January, 1919 (M.F./Gen./1486).

There was much delay in passing the accounts. On 3 August, 1918, the Treasury requested the War Office and Ministry of Munitions to hasten the audit, as apart from the accounts for the first two months of 1915, Messrs. Morgan had not yet been informed that any account had passed the departmental audit, and the delay constituted a serious grievance to the firm.[1] Certain minor points were raised—for instance, the allowance of interest on certain accounts, and the charge of commission on the cost of freight, which had been expressly excluded under Clause 11 of the original agreement. The firm agreed to refund this item, which had been charged through a misunderstanding,[2] and later it was stated (30 June, 1920) that the accounts balanced to date agreed to a penny with Messrs. Morgan's accounts.[3] The work of auditing continued throughout 1919, the accounts to June, 1918, being accepted by the end of July, and those to 31 March, 1919, by April, 1920, while by the end of the year the bulk of the 1920 accounts had been passed.

---

[1] 30209/18 in M.F./Gen./1486.
[2] N.Y. 83063.
[3] N.Y. 17131.

CHAPTER VI.

THE WORK OF THE MINISTRY OF MUNITIONS IN ORGANISING PRODUCTION OF MUNITIONS IN THE UNITED STATES.

I. Introductory.

A report on munitions purchases in the United States, drawn up in December, 1917, by Mr. W. T. Layton and Mr. P. Hanson, summarises the policy of the Ministry with regard to American purchase as follows :—

> "Early in 1915, large orders were placed by the War Office for ammunition in America, owing to the uncertainty as to the development of production at home, and during the rest of that year the Ministry of Munitions greatly extended this policy and applied it to rifles, small arms ammunition, machine guns, explosives, propellants, etc., and, in fact, supplemented by American orders our home output of all classes of munitions, with the chief exception of heavy artillery. British output, however, was so much more successful than it was possible at the outset to assume that during 1916 orders, first for light shell, and later for other classes of munitions were reduced or cancelled.[1] In the case, only, of heavy shell, the enormous demands of the Army, based on experience on the Somme were so far in excess of our assured home capacity that large new orders were placed both in America and Canada. These orders account for the high expenditure in the first quarter of 1917.[2] Home output has, however, proved capable of meeting the greater part even of the heavy ammunition programme, and these are now terminated, except as regards 6 in. shell.[3]
>
> Further, during the winter 1916-1917 dollar difficulties made it necessary to economise in America to a very large extent, and we were able to cut off almost all orders for finished munitions (the chief exception is motor transport and machinery) and obtain only raw materials from the United States. . . .

---

[1] The imports from the United States of light and medium shell in 1916 and 1917 were as follows :—

	1916.		1917.
Light	15,031,700	..	1,086,200
Medium	3,686,400	..	41,400

(Hist. Rec./H./1141·1/1).

[2] $79,700,000 per month, nearly double the average for the second half of the year (C.R. 4296).

[3] The imports from the United States of heavy shell, other than 6 in., were, in 1917, 2,042,600. In 1918 they were only 48,600 (Hist. Rec./H./1141·1/1).

> The policy of buying materials instead of finished munitions economises dollars, but it is wasteful of tonnage. . . . If the tonnage situation is to get steadily worse and credit considerations could be left out of account, our policy should clearly be to use the vast industrial capacity of America to manufacture our ammunition and other munitions as far as possible in that country. In this connection we have already cancelled the scheme for building an enormous factory for making nitro-cellulose which was started last winter with a view to reducing our dependence on America for finished propellant.
>
> . . . In the present programme for U.S.A. there is no item which does not fall under one of three heads ; either (1) the article required cannot be obtained in the United Kingdom at all (*e.g.*, certain kinds of machine tools, certain aeroplane engines, the metal ferro-silicon) ; or (2) it cannot be produced or imported in sufficient quantity without the help of the U.S.A. (*e.g.*, steel, copper, spelter, 6 in. shell) ; or (3) its production in the United Kingdom, or its importation from elsewhere than the U.S.A., would mean a call on our shipping tonnage which it cannot stand (*e.g.*, the case of nitro-cellulose powder already mentioned ; the case of lead. . . .)
>
> The expenditure on munitions account represents a vital part of the munitions programme, and includes in addition to shell steel, over 50 per cent. of our total copper requirements, between 50 per cent. and 60 per cent. of our propellant, 92 per cent. of acetone, 83 per cent. of sulphur supplies, most of our ferro-silicon, 40 per cent. of our aluminium supplies, a considerable proportion of our tank supplies, and all of our spruce. . . . ."[1]

Subsequent reports drawn up by Mr. Hanson show that the policy of reducing to a minimum the imports of manufactured goods was maintained, with some inevitable limitations.[2] The export of raw material was not always regarded with favour in the United States. In July, 1918, the Ministry directed its representatives to inquire as to the possibility of obtaining 1,000,000 tons of pig iron from the United States in equal monthly instalments during 1919. Sir Charles Gordon reported :—

> "This enquiry has been the subject of several conferences with the Director of Steel Supply, who . . . is causing a very exhaustive investigation to be made before giving a decision as to whether or not the pig iron will be available. . . . It must be realised that the sending of this quantity of pig iron out of the country will mean a tremendous strain, particularly in view of the very great requirements of pig iron for the production of

[1] Report dated 21 December, 1917, pp. 2–5 (C.R. 4296).

[2] The high proportion of munitions materials as compared with finished munitions imported from the United States during the last year of the war is illustrated by the table given in Appendix VIII.

steel in the United States. . . . Then, again, the United States would naturally prefer to ship finished steel products to Great Britain rather than pig iron, and it was only with great difficulty that we were able to arrange for the 180,000 tons of basic pig iron ordered by the Ministry in May. . . ." [1]

At the same time it must be noted that the policy of decreasing the imports of manufactured goods was a necessity after the United States munitions programme had come into operation. Sir Charles Gordon drew the attention of the Ministry to the difficulties resulting from this programme in his report for the month of September, 1918.[2]

"Great difficulty is being experienced with respect to orders received from London for the purchase in the United States of materials and equipment, manufacturing capacity for which is entirely taken up with orders for the United States Army. Under the present procedure the applications for the purchase of these materials submitted by us to the Purchasing Commission of the U.S. War Industries Board are referred by them to the United States War Department. Invariably we are informed that the requirements of the United States Army are such that the placing of the orders for the British Government cannot be permitted. A case in point is the order for 50 ten-wheel locomotives required for Mesopotamia. Owing to the locomotive shops in the country being entirely filled with orders for construction of locomotives for France as well as United States Railways, it is necessary for the Allied Purchasing Commission to refer our application for the purchase of 50 locomotives for Mesopotamia to the U.S. War Department as well as to the U.S. Railroad Administration. Both the War Department and the Railroad Administration refused to permit of capacity being released to us, and 30 days' time was lost before the order was placed.

We have several applications pending at the present time for ammunition for Colt Automatic Revolvers, repair parts for Colt Revolvers, and other like materials.

A similar condition exists in regard to some materials required by the French and Italian Governments, and the whole question is now receiving the attention of the Chairman of the War Industries Board, who is endeavouring to work out an arrangement which will be satisfactory to the interests concerned."

The entry of the United States into the war, and the beginning of the United States munitions programme, was followed by a change in the general character of the work of the Ministry in the United States, viewed as a whole. It was still essential that the capacity of new firms should be investigated before their tenders were accepted, that new sources of supply should be sought for where the existing sources were inadequate, that assistance should be given to contractors, both in the way of technical advice and the provision of equipment, that care should be taken that the necessary facilities for transport were not lacking, that

[1] Report of Sir Charles Gordon, dated 30 August, 1918 (A.B./Gen./81).
[2] A.B./Gen./81.

prices were not increased by competition on the part of the various Allies : nevertheless there was a distinct change. From that time the work of the Ministry tended to become less a matter of negotiation with individual firms and groups of firms in the United States, and more a matter of negotiation with the departments of the United States Government. Recognition of this change can be seen in the appointment of Lord Northcliffe in June, 1917, and the transfer of functions from Messrs. Morgan to a department of the British War Mission.

II. The Investigation of Capacity and Sources of Supply.

The work of investigating new sources of supply was at its heaviest in 1915 and 1916, when the technical capacity of American firms had not been tested by experience.[1] On Messrs. Morgan's resignation of the Commercial Agency in 1917 the whole of the work of preliminary investigation passed to the Purchasing Department. The entry of the United States into the war had two effects, operating in reverse directions. In the first place the United States Purchasing Commission, to whom all requirements had to be submitted, by indicating the sources of supply open, restricted the free choice of the Purchasing Department in placing contracts. In 1917, for example, the Purchasing Commission named five firms with whom contracts for 6-in. shell might be concluded, and Sir Charles Gordon reported, in February, 1918, that the delay in deliveries was primarily due to the fact that the Purchasing Department was deprived of discrimination in the matter.[2] There was little to be gained from a preliminary investigation of capacity under these circumstances. Similar conditions prevailed in connection with orders for steel ship-plates in January, 1918. Further, advice as to available sources was given by the War Industries Board, which itself controlled the production of certain materials.[3] On the other hand, the necessity for strict investigation was increased by the fact that many of the firms whose capacity had been tested by experience were occupied with United States Government orders. In October, 1917, for instance, the Purchasing Department reported on the state of the market for ferro-silicon ; in December the Production Department was investigating the plant of firms that had made tenders for the manufacture of automatic pistols for the air service, and as late as October, 1918, the Purchasing Department reported on certain offers that had been made for the supply of diphenylamine.

Such preliminary investigations were essential in order to prevent the placing of orders with firms with no possibility of production ; for example, in January, 1916, General Pease reported that a firm with whom it had been proposed to place a contract for rifles had entirely inadequate facilities for the work.[4] The placing of orders with such a firm would have been disastrous.

---

[1] See above, Chap. III and IV.

[2] A.B./Gen./81.

[3] Memo. on Shipping, Munitions, War Supplies and Shipbuilding, 22 August, 1918 (C.R. 4296).

[4] N.Y. 11881.

As was perhaps inevitable, however, the estimates of probable deliveries formed as a result of these investigations were not very reliable, hence the importance that Sir Ernest Moir attached to the "hustling" work of the Progress Department. The most searching preliminary investigation could not prevent disappointments in deliveries. There were cases, no doubt, in which avoidable mistakes were made; Sir E. Moir commented (31 March, 1916) on the unfortunate choice of firms for the supply of fuzes and copper bands; but, generally speaking, failure in the fulfilment of contracts indicated rather the impossibility of discovering the most successful manufacturers except by experience, and the necessity for giving to manufacturers constant help to enable them to carry out their undertakings.

III. The Development of New Capacity.

By the spring of 1917, as was stated in the report drawn up by Mr. Balfour's Mission, the orders of the Allies in the United States had "developed a vast potential capacity in America in almost all classes of munitions." This development had taken place gradually. At first orders were placed mainly with the larger firms in the Eastern States; as time went on the capacity of these firms was exhausted, and orders had to be given to smaller firms and scattered more widely over the country, the maximum point in the development being reached apparently about the middle of 1916. This development carried with it not only increased work for the officers engaged in inspection and those who, as we have seen, were occupied in investigating new capacity, but also the building by the firms of extensions on a large scale and the acquisition of machinery and machine tools. The firms were, in many cases, not willing to bear the expense of extensions and equipment without financial assistance from the British Government, and they obtained this assistance in several ways, either indirectly through an increase in the price charged for the supplies, or directly by an advance payment of a part of the contract price within a stated time of the conclusion of the contract, or by the grant of a sum of money in addition to the price paid for the goods for the repayment or deduction of which no stipulation was made. Further, mention must be made of the development of new capacity consequent upon measures not of a financial character taken by the British Government.

(*a*) Increased Prices.

On the whole, the prices charged for munitions by United States manufacturers were much higher than the prices paid in the United Kingdom,[1] and manufacturers would only accept contracts at prices which enabled them to write off the cost of extensions and equipment.[2]

---

[1] See Letter from Ministry of Munitions to Foreign Office, dated 4 July, 1917 (Hist. Rec./R./1141/12).

[2] Sir E. Moir referred to the cancellation of contracts as cutting off "the ability to amortize the expenditure on plant," Report dated 9 May, 1916 (Hist. Rec./R/1141/7).

Sir E. Moir commented on the fact in connection with the shell orders placed in America.[1] He calculated that for over one-half of the 9·2-in., 8-in. and 6-in. shell then on order in the United States new equipment had to be installed, and he pointed out the undesirability of paying for such equipment in the contract price when it would, at the end of the contract, remain the property of the United States manufacturers. The difficulty was inevitable, and all that could be done by the Ministry or its agents was to secure the best terms possible from the contractors.

(*b*) Advance Payments.

During the first eighteen months of the war, when the bulk of the extensions and installation of equipment were in progress, the contractors frequently stipulated for the payment of a proportion of the price in advance. The practice dated from the earliest months of the war,[2] and although considered undesirable by the War Office was regarded as inevitable. Advance payments played a considerable part in the development of nitro-cellulose production in the United States during the years 1914 to 1916.[3] The practice of making advance payments was, as has been stated above,[4] strongly deprecated by Sir. E. Moir, on the ground that it led to the extravagant equipment of factories and to a lack of energy on the part of the firm in carrying out the provisions of the contract. It was very much less frequently followed in the latter part of the war. Instances can, however, be found as late as 1917.[5]

The original contracts concluded with three rifle-making companies (30 April, 1915), provided for advance payments of 25 per cent. of the total price, but under the terms of new contracts, superseding the former ones, which were concluded in December, 1916, the plant used in the production of the rifles became the property of the British Government. In March, 1917, the number of rifles to be delivered was still further reduced, and it was anticipated that the plant would shortly be available for further manufacture. Mr. Balfour's Mission arranged that this plant and the material remaining at the works should be sold to the United States Government; and the process of the transfer continued to the middle of 1918. The availability of this plant was one of the factors determining the United States Government to adopt the Enfield 1914 Pattern rifle rebored to take ·300 ammunition.

A variant of the usual form of advance payments was the stipulation that a deposit should be paid on the signing of the contract. This was the subject of a ruling by the Minister of Munitions at a conference on 7 July, 1916, when it was stated that "It is undesirable to place orders with firms which require deposits on signing the contract.[6]

---

[1] Report dated 16 August, 1916 (Hist. Rec./R./1141/7).
[2] See above, p. 25.
[3] Vol. X, Part IV, Chapter VI.
[4] See above, p. 49.
[5] N.Y. 55234, 51605.
[6] Hist. Rec./R./1141/57.

(c) PROVISION OF CAPITAL.

The principle of making a definite contribution towards the cost of extensions of plant and equipment was conceded in the case of a group of shell producers in March, 1915.[1] There was no provision in this case for the repayment of the capital; it was arranged, however, that the plant should be at the disposal of the British Government for further orders, if it was desired that such should be placed, and that certain portions of the plant and equipment might be removed if not in use. The necessity for the provision of capital declined in course of time; however, in December, 1917, a contract was concluded with one munitions company involving the payment of an irrecoverable sum in addition to the purchase price;[2] and in January, 1918, arrangements were made for the financing by the British Government of an extension of plant for the production of acetone and methyl-ethyl-ketone, at a total cost of $1,250,000. At the same time, similar extensions of plant to the value of $7,000,000 were financed by the United States Signal Corps.

The great development of output attained by some American firms in response to British orders is illustrated in a memorandum by Colonel Phipps (16 February, 1917):—

> "Scovell and Sons, Waterbury, Connecticut, had no buildings up to December, 1914, yet in 1915 this firm produced millions of No. 85 T. & P. fuze. . . . In 1916, the capacity over that of 1915 was quadrupled, so that the firm was ready, in May, 1916, to produce 40,000 of these fuzes *per diem*. This same firm specialised in No. 85 (an American) fuze, and in 18-pdr. brass cases; of the latter some fifteen millions were made. . . . Previous to 1915, the firm had never made a brass cartridge case and only 5,000 fuzes (total). . . .
>
> Bliss and Co., Brooklyn, New York, manufacturers of torpedoes, undertook to make shell late in 1914, and at once began to put up shell factories. The capacity went on increasing and in the early months of 1916, this firm was giving us one million 18-pdr. shells per month, besides numbers of other natures of shells. . . .
>
> Traylor and Co., Allentown, Pennsylvania, started shell manufacture early in the war and reached in sixteen months an output of one million 18-pdr. shells per month (this with the aid of sub-contractors). . . .
>
> The Bethlehem Steel Co. had orders for a variety of munitions, many hundreds of various natures of guns and carriages, many millions of complete rounds of 18-pdr. and 13-pdr. Q.F., also large contracts for heavy shells; within a year of starting work the Bethlehem Steel Company were able to give us half a million complete rounds of 18-pdr. per month, and within eighteen months the output was three-quarters of a million per month."[3]

---

[1] See above, p. 25. [2] N.Y. 57880. [3] HIST. REC./H./900/2.

The existence of the plant used for the production of British equipment was a strong factor in deciding the types to be adopted by the American army; although it was not thought well to adopt British types entirely, the choice made allowed of the utilisation of existing plant. Thus in April, 1918, Colonel Symon reported that the Midvale plant installed for the manufacture of 8-in. howitzers for the British Government was being used for the manufacture of 8-in. howitzers for the United States Government.[1] Further, before placing orders the United States Government asked for the advice of British officers as to the firms with which they should be placed. Thus a list of firms with whom gun orders might advantageously be placed was drawn up by Colonel Kenyon in May, 1917, with comment on their capacity as proved in the fulfilment of British orders.[2]

IV. Speeding up Supply.

The work of speeding up production, which had been done by the Progress Department of the British Munitions Board,[3] passed to the Production Department under the British War Mission. It continued on the same lines as before. It compiled reports on the progress of contracts then running and attempted to "hustle" production in every possible way. Further, advice was given as to the sources of raw materials, and assistance in securing deliveries of equipment and manufactured parts necessary for output. The following extracts from the monthly reports of the Production Department[4] give some indication of the character of its work:—

> "*Acetone*. . . . The works of [a manufacturing company] were visited on the 31 October. . . . Our representative obtained a list of equipment for which this Company has placed orders, with a view to assisting them in getting promptest possible delivery of such equipment.
>
> *Fuzes*. . . . As bushes for fuze No. 106 are urgently required by the Ministry, we have made every effort to expedite deliveries. Every assistance has been afforded the contractors in the matter of obtaining steel. . . ."[5]
>
> "*Shell Steel Billets, Ingots and Forgings*. All plants are more or less in difficulty from lack of raw materials and also due to shortage of empty railroad equipment. These conditions have been promptly investigated by us, and brought to the attention of the Government authorities through the Washington office."[6]

---

[1] Report of General Headlam to the Ministry of Munitions, 23 April, 1918. Washington Papers, 1–11-6, 2/3.
[2] D.M.R.S./518 H.
[3] See above, p. 45.
[4] A.B./Gen./81.
[5] October, 1917.
[6] November, 1917

"*Carbon Electrodes and Powders.* . . . . We have rendered considerable help to contractors in getting shipment of raw materials to themselves, and in getting their electrodes and powder shipped when ready. . . .

Corundum Grinding Wheels. These contracts were followed up, and assistance and advice rendered to contractors in getting material, etc., to their works."[1]

"*Acetone.* . . . During the month, the efforts of this Department were for the first time exerted on behalf of [a firm who were] re-modelling their distillery in order to manufacture Acetone. The Company was aided in securing priority certificates to cover their orders for seed, mash, fermenting and inoculating tanks, steam pumps, valves and fittings, and miscellaneous building materials."[2]

The value of this work is difficult to estimate; it was increased by the good relations established between the firms and the representatives of the Ministry, the latter being regarded as a source of help on which to rely in time of difficulty.

V. Technical Assistance and Advice.

One of the most important functions of the Ministry's representatives in the United States was the giving of advice on technical matters. From the placing of the first orders for war supplies in the United States, the necessity for the appointment of technical officers was recognised. The first technical officers sent over were inspectors, and throughout the period of the war advice and assistance were given by the inspectors in addition to their purely inspection work. The officers of the inspection staff had special opportunities for knowing in what direction assistance was needed, and in the case of the larger firms they were on the spot, stationed at the works for inspection purposes. It was found, however, that the inspection officers, occupied as they were with other duties, had not time to give the firms all the help they needed. and, therefore, when the "E. W. Moir Organisation" was established it undertook to give technical as well as other help to manufacturers, this work passing later to the Progress Department, and thence to the Production Department. The Inspection and Production Departments continued to exercise these functions simultaneously, there being, fortunately, only occasional friction and little overlapping. They were assisted further by successive missions which came to the United States for varying periods to deal with some special matter of a technical character.[3]

---

[1] January, 1918.
[2] February, 1918.
[3] Technical help of special importance was given by Mr. C. G. Atha when he visited the United States to investigate sources for the supply of shell steel billets and to give technical assistance to firms engaged in the production of steel.

Colonel Phipps, who was in charge of inspection in the United States from January, 1915, to May, 1916, recognised from the first the assistance which it was possible for him and the officers who worked with him, to render to the manufacturers.

> "Our time on arrival in U.S.A.," he states in his report,[1] "was well occupied in seeing representatives of firms. It was soon realised that we would have to teach firms and help them with their work. . . . The success out here depended a good deal on the firms learning their new work quickly and on their acquiring complete confidence in the British inspecting officers. . . . We helped them and they responded to our requirements with every feeling of confidence, knowing that they were on the right track in their manufacture."

The principle thus enunciated by Colonel Phipps was continued by his successors, General Minchin and Colonel Kenyon. A few examples of the kind of work done may be quoted. Considerable difficulty had been found by manufacturers of H.E. shell.[2] With the exception of the Bethlehem Steel Company, there were no steel makers in the United States with any experience in the manufacture of shell steel. The steel works were organised to produce commercial steel, and the main object appeared to be "to produce the maximum quantity of steel in a minimum of time, often without much regard to quality." The methods of manufacture and of testing differed in many respects from those prevalent in England. One of the changes introduced on the advice of the inspectors was the adoption of the scribed line test for the yield point in lieu of the drop of beam method hitherto universal, the Carnegie Steel Company and their many subsidiary concerns being among the later converts. Again, there was, in the opinion of Colonel Kenyon, in the latter part of 1916, considerable scope for improvement in the quality of the shell forgings produced. Accordingly a memorandum was drawn up to guide manufacturers,[3] which dealt amongst other particulars, with the chipping of billets, the heating of the furnace, the setting down of billets. Another example of the work done by inspection officers in promoting production is seen in the publication towards the end of 1917 of a pamphlet on gauges by the officer in charge of the gauge section of the Inspection Department.[4]

In a memorandum dated 13 June, 1917,[5] Colonel Kenyon stated that useful work had been done by members of Mr. Moir's staff in the early stages of munitions production in the United States; they had visited firms starting on some branch of munitions and had given help and advice; he did not think, however, that such instruction was any longer necessary.

---

[1] HIST. REC./H./900/2.
[2] Report of Mr. A. H. Collinson, Washington Papers, 3–20–1, 5/14.
[3] *Ibid.*
[4] Report of Inspection Department for November, 1917 (A.B./Gen./81).
[5] Inspection of Munitions, Col. Kenyon's Memoranda, etc., Washington Papers, 3–20–1, 5/20.

The fact that there were two sets of officers engaged, partially at any rate, on similar work led to attempts on the part of manufacturers to appeal from one to the other; thus complaints were frequently made to the Production Department of the high standard demanded by inspectors. In November, 1917, the difficulties of contractors engaged in the production of bushes for fuze No. 106 led to negotiations between the Production and Inspection Departments which resulted in a temporary relaxation of rigour on the part of the inspectors, but it was found later that the requirements of the inspectors should have been tightened rather than made more lenient. On some occasions, however, the Production Department secured useful concessions in the contractors' favour, as occurred in the case of a manufacturer of screw gauges in January, 1918.

To a great extent Colonel Kenyon's criticism was justified, and after the reorganisation under Sir Charles Gordon the work of the Production Department in giving technical assistance to firms was far less prominent than in earlier times, being overshadowed by the other activities of the department.

VI. Transport.

The work of the Ministry in relation to transport covered only the period from the appointment of Mr. Karr in March, 1916, to the transfer of the Traffic Department to the control of the Ministry of Shipping in August, 1917. During that period useful work was done in diminishing congestion at the ports and on the railroads, but the vast amount of stores moving towards the seaboard inevitably disorganised transport facilities.

The type of difficulty which Mr. Karr's department had to meet is set forth in a cable from Messrs. J. P. Morgan on 31 December, 1915,[1] referring to the railway embargoes, which were refusals of individual railways to accept freight for some particular district owing to the fact that freight was accumulating at that point faster than it could be removed by the consignee. At that time New York was the district against which embargoes had been issued. All the railroads were more or less affected by the embargoes. Each railway created its own list of articles which it refused to accept; the existing embargoes were directed against manufactured goods of all classes, steel and wire, automobiles, machinery and all munitions of war except explosives. Originally these restrictions were directed only against articles for export, but they had been extended to cover other goods also. The length of time over which the embargoes were valid varied with the different railways, continuing until the congestion on the particular route was relieved. These embargoes carried with them the danger of serious delay to the execution of contracts. On the other hand the possibility had to be guarded against that manufacturers might use the railway congestion as an excuse for late deliveries.[2]

[1] N.Y. 11823. [2] N.Y. 13307.

Mr. A. E. Fellowes had been sent out to expedite shipments of machine tools for private owners and raw materials[1] and in April, 1916, he, with Mr. Karr, who had been deputed to investigate the causes of the congestion, made various recommendations. Sir Ernest Moir reported on 16 August, 1916, that the shipment of munitions was proceeding much better than before, and later, in October, he reported that the recommendation put forward by Mr. Fellowes and Mr. Karr that more use should be made of ports other than New York had resulted in a better distribution of freight over the various ports. On 5 February, 1917, Mr. Japp stated that although the shortage of cars on the railways continued and the movement of raw materials to the various plants was still very slow and consequently retarded the transportation of the finished product, he had been able to push forward the transport of munitions and other freight in which the Government was interested.

The condition on the railroads grew worse after the entry of the United States into the war. In May, 1917, information was received from the Railroad Car Commission in Washington that instructions would be given to the railroads not to allow any more movement of munitions to the seaboard until the munitions then on hand were shipped. Two months later it was reported that the position had eased somewhat owing to the decrease in the quantities of grain being moved, but shortly afterwards it again became difficult as the available routing facilities were largely monopolised for the conveyance of United States material and troops.

The function filled by the Traffic Department was to watch the routing conditions to prevent lack of transport facilities from holding up supplies. To carry out this work a detailed knowledge of the contracts which were approaching completion or partial completion was essential; hence the necessity for close co-operation between the department dealing with transport and that dealing with production.

VII. Prevention of Allied Competition.

Reference has already been made to the disadvantages that arose owing to Allied competition in American markets,[2] and to the measure of remedy provided by the partial centralisation of buying under Messrs. J. P. Morgan.[3] Before the entry of the United States into the war, the position of Great Britain as the dispenser of credit to the Allies enabled her to institute some control over Allied purchases, and this control was fairly effective in the cases of Russia, Serbia, and Italy. After the settlement in 1917 of the system by which United States credits were distributed to the European Allies competition was to a great extent prevented by the necessity of submitting requirements for approval to inter-Allied bodies in Europe, and of obtaining permission to purchase, priority ratings, etc.,

[1] C.R./4548. [2] See above, p. 37. [3] See above, pp. 38-42.

from the United States Purchasing Commission and War Industries Board. It was further avoided by the formation of inter-Allied committees and by inter-Allied conferences in the United States. For example, when the question of the supply of wood distillation products was urgent in the spring of 1918 frequent conferences were held; on 9 February a conference of United States, French, Italian, and British representatives determined the division of acetone, methyl-ethyl-ketone, etc.,[1] further meetings being held in March.

Throughout the period of the war arrangements were made from time to time for the purchase of specified commodities by the Ministry for other of the Allies, especially with regard to metals.

In August, 1915, for instance, France, Belgium, and Italy had been asked to refrain from making enquiries respecting aluminium, except through the Ministry, as prices in America were rising rapidly.[2] In 1915, also, arrangements were made, which were confirmed at the Paris Conference in April, 1916, that the Ministry should undertake all purchases of copper in America on behalf of the French Government. It was agreed that all demands for copper received by the French Ministry of Munitions from Italy, Belgium, or any other Allied country, should be forwarded to the British Ministry.[3] Again, in April, 1916. it was decided after consideration at the Paris Conference that while France should make her own arrangements for the supply of zinc, Russian requirements for 1916 should be purchased by the Ministry of Munitions. This ruling applied to all purchases, not only to those made in the United States.[4] At the same time arrangements were made for assistance to be given to Russia in the supply of aluminium.[5]

Similarly, in 1916, it was arranged that Russian and Italian requirements for nitro-cellulose powder from America should be met through the instrumentality of the British Ministry,[6] and again, in December, 1917, it was agreed that purchases of acetone for the French and Italian Governments in the United States should be made by the representatives of the Ministry.[7] The possible difficulties arising from Russian competition were largely obviated after June, 1916, by the existance of the Anglo-Russian Sub-Committee.

---

[1] (*Printed*) *Weekly Report*, No. 143, XIV (25 May, 1918).
[2] HIST. REC./H./1830/1.
[3] HIST. REC./H./1820/1.
[4] HIST. REC./H./1840/1.
[5] HIST. REC./H./1830/1.
[6] Vol. X, Part IV, Chapter III.
[7] (*Printed*) *Weekly Report*, No. 125, XV (12 January, 1918).

CHAPTER VII.

THE INSPECTION OF AMERICAN MUNITIONS.

I. Development of Inspection Services, 1914 to 1916.

(*a*) Inspection before January, 1915.

When the first orders for munitions were being placed in America, Major Burdon and two assistant foremen were sent out from Woolwich, in September, 1914, to inspect certain Bain and Studebakker wagons before shipment to England.

Another inspector, Major Farmar, was sent out at the same time to inspect small arms and small arms ammunition and in October he received the assistance of nine examiners. More staff followed, as orders placed with American firms increased, and on 30 December Lieut.-Colonel Phipps left England to take charge of the work of inspection in America.

(*b*) Inspection under Lieut.-Colonel Phipps.

Lieut.-Colonel Phipps landed at New York on 9 January, 1915, and proceeded at once to Bethlehem, the headquarters of the firm with which some of the most important munitions orders had been placed. The work in hand at that time amounted in value to about £13,000,000, and his staff, which was all that Woolwich could spare, was conspicuously inadequate.[1] The work was centred in three districts, Bethlehem, Pittsburgh, and Waterbury. Lieut.-Colonel Phipps established his headquarters at Bethlehem in the main offices of the Bethlehem Steel Company, and Colonel Embury remained with him to deal with guns and carriages.

A considerable amount of preparatory work was necessary before much progress could be made with inspection. In the first place forms had to be designed for the proof of guns, carriages, primers, cartridge cases, fuzes, propellants, for inspection certificates, for testing of materials, for chemical analysis, and for gun measurements ; secondly instructions had to be issued to contractors regarding the use of inspection certificates, packing and shipping of stores ; thirdly, a local staff of examiners had to be engaged to supplement the very small staff sent out from Woolwich ; and lastly, it was necessary to obtain gauges, proof shot, guns for proof, tools and instruments, and to issue drawings to contractors. As soon as this had been arranged for, the next task was the preparation of the proof grounds ; to this Colonel Phipps gave his personal attention.

[1] This staff consisted of the Deputy Chief Inspector, Colonel Embury, six officers, two writers, one chemist, eight examiners, thirteen fuze examiners, six cartridge examiners, twenty-one shell examiners, and nine small arms examiners.

Proof grounds were established at Cape May and Redington. At Redington, Colonel Phipps had first to arrange for the erection of large sand butts to permit the firing of H.E. shell for proof recovery: he had to obtain and experiment with 18-pounder guns, 5-in. howitzers, 4·5-in. howitzers, 60-pounders, 4·7-in. and 6-in. B.L. Particular difficulty was found in connection with the proof recovery of the 6-in. gun shell, but these difficulties were overcome.[1] Colonel Phipps stated that in all this work he received great help from the Bethlehem Steel Company.[2]

From March, 1915, onwards the number of munitions contracts placed in America increased enormously. Colonel Phipps in his report [3] instances two contracts, each for 5,000,000 complete rounds, placed with the American Locomotive Company and the Bethlehem Steel Company; these involved large numbers of sub-contracts, which were scattered all over the United States, several of them a thousand miles away from headquarters. The work continued to increase during the spring and summer of 1915, and the staff at the disposal of Colonel Phipps became more and more inadequate. In July a small number of assistant inspectors and examiners were sent out in response to the repeated requests of Colonel Phipps, and a further number were sent out later in the year: the most important accessions to the inspection staff were two officers who came out in the summer of 1915. The help was much needed, for by August the value of the contracts in hand had increased to £150,000,000, as compared with £13,000,000 in January, and by April, 1916, the value had further increased to £450,000,000.[4]

In the spring of 1916 the transfer of the Inspection Department's headquarters to New York, which had been recommended by Mr. D. A. Thomas and Mr. Moir, was carried out,[5] and General Minchin was sent out to reorganise the Department.

The necessity for these changes was emphasised by the arrival of unsatisfactory material from America. The lack of sufficient inspection staff had made it impossible for inspection to be carried out as thoroughly as in England, and it was therefore arranged that all stores should be re-inspected on arrival in England.[6] A considerable proportion had to be rejected, though rectification was possible in many cases. Especial difficulty had been found in connection with the No. 100 fuze. Mr. Moir had reported (January, 1916) that American manufacturers seemed to have surprising difficulty

> "in working to the limits of accuracy which are imposed upon them by the War Office specifications. A good deal of leeway

---

[1] It would appear that 6-in. shells could not be proved in United States until January, 1916, owing to the absence of the 6-in. gun (L. 12458, N.Y. 13226). Even then some delay was caused by the breaking of the breech magazine at the first round (N.Y. 13422).

[2] HIST. REC./H./900/2.

[3] *Ibid.*

[4] These figures are given by Colonel Phipps (HIST. REC./H./900/2).

[5] See above, p. 46.

[6] D.F./3/P.A.C./37.

has, as a matter of fact, been given them by the inspection department, in order to enable them to produce munitions in any quantity; especially is this so in connection with fuzes.

"Their difficulty in producing the ·303-in. cartridge is to me extraordinary, but I do not think they have put forward their best efforts, and this, to my mind, is due largely to the fact that nearly all the small arms ammunition people have got higher prices from the Allies, and the Spaniards . . . than they have got from us."[1]

Mr. Moir did not agree with General Pease's opinion that no better results could be obtained. That there were instances in which defective stores had been delivered was acknowledged by Colonel Phipps; he mentions in particular in his report certain 6-in. Mark XIII shell and the No. 100 fuze; but, as he said, if his lack of adequate assistance and the enormous quantity of material delivered were considered, it could not be maintained that the results on the whole were unsatisfactory. Mr. Moir, however, was of opinion that the standard of inspection might have been improved if Colonel Phipps had allowed himself sufficient time free from the details of the work to visit his district inspectors and co-ordinate their work.

II. Reorganisation of the Machinery of Inspection, 1916.

General Minchin arrived to carry out his task of reorganisation on 5 April, 1916. The improvement in the efficiency of inspection which followed was due to this reorganisation and to a large increase in the size of the inspection staff, which in May and June, 1916 was doubled. Even then the inspection service was not perfect, for a considerable quantity of defective shell (6-in.) and fuzes was sent to England.[2]

The difficulty that arose in connection with General Minchin's work was one of administration. On the departure of Sir E. Moir for England, the Inspection Department was made subordinate for administrative purposes to the "E. W. Moir Organisation," while on technical matters it continued to correspond direct with Woolwich. This arrangement was not a very satisfactory one, and on General Minchin's resignation (September, 1916) a mission was sent out under Mr. A. H. Collinson to investigate the work of inspection in the United States, the responsibility for the work of the Inspection Department devolving temporarily upon Colonel L. R. Kenyon, who had been assisting General Minchin since his arrival in America in June, 1916.

Mr. Collinson arrived in New York on 5 November, 1916. The appointment of Colonel Kenyon was confirmed, and the title of Director of Inspection (U.S.) given to him.

---

[1] First Report of Mr. Moir, dated 28 January, 1916 (C.R./4548).

[2] Six-inch shell showed most defects on re-inspection in England, because contracts had been placed with smaller and less capable firms than for the larger sizes (Hist. Rec./H./900/16).

The division of the work of the inspection of general munitions into geographical areas was left untouched, there being now six districts, Bethlehem, Pittsburg, Waterbury—Colonel Phipps' original districts—New York, Chicago, and Philadelphia, with an inspector and assistant inspectors in each.

A detailed investigation into the methods of inspection and the causes of defects in the various classes of stores shipped followed. The enquiry showed that very considerable differences existed between inspection in England and in the United States. In the first place, in America the contractors were not under Government control, and therefore special consideration had to be shown for their difficulties. Owing to the urgent need for supply it was not possible to include in the terms of contract any kind of penalty clause, either delaying full payment until after final inspection in England, or imposing conditions of replacement in the case of the delivery of defective stores. Further, the difficulty of inspection in America was increased by the immense distances between various centres of production; this factor resulted in a tendency for the standard of inspection to differ in different localities. It was decided that an attempt should be made to remedy this by the appointment of two travelling inspectors, who, with the assistance of three or four examiners, were deputed to visit works and re-examine a percentage of inspected work, making reports direct to headquarters as well as to the District Inspector concerned. This system came into operation in January, 1917. It was considered by Colonel Kenyon to have been very successful. Towards the end of 1917 it was thought that the decrease in shell and steel work justified the cessation of the functions of these officers, but the result was so unsatisfactory that in February,1918, a travelling inspector was reappointed.[1]

Another difference between inspection in England and in the United States was caused by the fact that there were no central bonds, where the examination and packing of stores could take place. It was thought at the time that this difference could not be eradicated, owing to the disadvantages that would result from the institution of central bonds, either under British Government control, when it might cause international complications, or under the auspices of large American firms, when trade rivalry would be roused.

There was, further, a fourth difference, to which the wide geographical area covered and the lack of central bonds contributed; that was, the far greater reliance which was placed on shop inspection by the contractors. This was largely necessitated by the smallness of the inspection staff in the United States as compared with that in England. Mr. Collinson reported that the manufacturers, partly because they wished to make a good name in English markets, partly because they were anxious to keep their organisations together ready for trade after the war, and partly, especially later on, from a wish to assist the Allied cause, had

[1] Report of Inspection Department, dated 5 March, 1918 (A.B./Gen./81).

shown great readiness to produce munitions of a high standard. Colonel Phipps, in his reports, laid stress on the friendly relations existing between the firms and the inspectors, and Mr. Collinson also noted this as a factor making possible the comparatively scanty system of inspection.[1]

The number of examiners of all grades employed by the Inspection Department in November, 1916, was 1,336, of whom 113 had been trained at Woolwich. This figure may be taken to represent about one-tenth of the number necessary if inspection had been conducted in accordance with home standards. Similarly the cost of inspection in America (without the salaries and wages of the staff sent out from England) worked out at about one-tenth of one per cent. of the cost of the work inspected, as compared with a cost of about 1 per cent. in England.[2] The explanation of this difference lies to some extent in the fact that the examiners in America worked at least twice as fast as those in England[3]; but the main cause was that, owing to the confidence placed in the shop inspection system established by the leading American firms working on munitions contracts, only a percentage examination was, in most cases, carried out by the British inspectors. This was especially so in the case of shell. Mr. Collinson reported as follows :—

> "Preliminary examination is carried out on all shell, but, as regards main examination, only a percentage are fully gauged and examined, with certain exceptions, viz., fuze hole, visual examination, and hammer testing. At the rapid production plants, in fact at all the works, examiners get through the work at an amazing rate, when home standards are taken into consideration.
>
> "For instance, the Woolwich standard rate of examination for a 9·2-in. shell is laid down at one per man per hour. This figure is probably, however, exceeded in practice. For the same calibre shell, D.I.M.A. average, spread over the country, is four per man per hour, while at a few individual works six and a quarter per man per hour are being fully examined.
>
> "In America, at some of the works producing 3,000 9·2-in. shells per day, some 15 examiners are employed altogether on main examination. These men, in addition to fully gauging a percentage of the 3,000, hammer test, visually examine, and gauge fuze holes of the whole 3,000, or at a rate for these three last operations only, assuming a ten-hour day, equalling 20 per man per hour."[4]

---

[1] The Inspection Department reported that the standard of American inspection was as high as, though different from that at home, but that if home standards had to be enforced not only would contractors not face the rejections which might be incurred, but they would have lost interest in keeping up their own high standard of work and maintaining a thorough shop inspection of their own. It would also have entailed a British staff of ten times the size. (HIST. REC./H./900/16.)

[2] *Ibid.*

[3] Report by Mr. A. H. Collinson, Washington Papers, 3–20–1, 5/14.

[4] Washington Papers, 3–20–1, 5/14.

Mr. Collinson instanced various points in the inspection of different classes of munitions in which the procedure was not the same as at home. In the case of steel it had been found impossible to induce American steel manufacturers to accept contracts under the conditions laid down in the British home specification for H.E. shell steel. American manufacturers were accustomed to work on a very large scale, producing steel suited for general purposes, and their methods of casting, which were not adapted to the production of the high class of steel required for H.E. shell, led to the delivery of unsound steel and steel with secondary piping. A special form of specification was finally agreed upon, which differed from that in force at home, particularly with regard to the methods of removing discard, of fracturing the bars, and of taking mechanical tests. Mr. Collinson comments :—

> "With regard to these modifications, it is noted that steel is sentenced in the States on the results of tests taken from a normalised bar and the cast accepted,[1] it being understood that the forgemaster will be fully conversant with these conditions. . .
>
> "In America the usual forging practice puts a good deal more work into the steel than is often the case in this country.[2] For instance, billets are invariably set down in the dies before punching, and at approximately 50 per cent. of the works, in addition to setting down and punching, drawing is also employed. Again forgemasters are equipped with normalising and annealing furnaces, by either of which forgings are subsequently treated. In this country at many of the forgemasters, only one operation, viz., punching, is common, and few works are equipped with proper normalising furnaces, so that it may frequently happen that forgings made here from American steel will fail on mechanical tests." [3]

It was noted in connection with the inspection of steel that the selection of tests and the witnessing of breaking had been in the past largely left in the hands of examiners and that the tests were taken by the firm. It was decided by Colonel Kenyon, on the recommendation of Mr. Collinson, that, as soon as the senior staff was strengthened, the breaking of all test pieces should be witnessed by an inspection officer, who would take his own records of the results, and sentence accordingly. The specification only insisted on 10 per cent. of the bars in a cast being fractured. This was insufficient as a safeguard against piping. It was not thought possible for any change in specification to be introduced into the terms of contracts placed in America ; it was hoped, however, that some modifications might be made by steel manufacturers as a matter of arrangement, without any alteration in the contract specification, and in December, 1916, the Inspection Department induced American steel makers to adopt the scribed line test for yield point in lieu of the drop of beam method.

---

[1] When the test piece was normalised it could be improved to a greater extent than it was possible to improve the bulk of the cast.

[2] This made it possible to employ steel of a poorer quality.

[3] Report of Mr. A. H. Collinson, Washington Papers, 3–20–1, 5/14.

With reference to finished shell the attention of inspection officers was drawn to the main defects found on re-inspection in England; these were low fuze hole and bad varnish. It was thought that the bad varnish was confined to firms using shellac varnish, the use of which had been permitted only in the case of the smaller natures, and that the defects found in fuzes in England were due in many cases to differences in gauges and in the methods of applying them. In America only a percentage examination was made of finished stores, the shop inspection provided by the firms being relied upon to a large extent.

In the case of cartridge cases a thorough 100 per cent. inspection was made, and few complaints were received from England with respect to them.

A percentage examination only was the rule for small arms ammunition. A sample was taken from each lot of 200 cases, and the cartridges were gauged for head thickness, head diameter, length of socket, and inspected for all visual defects on cases and bullets. If the gauging and inspection gave satisfactory results the cases were then set aside for firing proof. This was carried out in accordance with the methods in force at Woolwich. It was not considered desirable to make the great changes necessary in order to institute a 100 per cent. examination.

All gauges for small arms ammunition were checked twice weekly, and sometimes even more frequently, by the examiner in charge. There was a general shortage of gauges, especially of screw fuze hole gauges, a fact that partly accounted for the defective fuze holes found in American shell. It is to be noted that the gauges in America were supplied by the contractors. There was also a lack of check gauges, with the result that gauge checkers had to rely largely on measuring instruments.

The nitro-cellulose powder supplied by Messrs. Du Pont and other firms was proved in America and re-proved in England. Samples of T.N.T. and ammonium nitrate were sent by the Inspection Department to English chemists for testing. The T.N.T. was very satisfactory, but the ammonium nitrate contained various impurities.[1]

Among the other stores inspected were brass rod, zinc and copper—the last being of such satisfactory quality that inspection was waived in February, 1917.

The question of delaying full payment on American munitions contracts until after inspection in England was also discussed, but the bulk of the contracts did not permit this. Shells and fuzes were re-inspected in England, but not guns and carriages. Re-inspection of shell was conducted on the same lines as inspection in America; that is, a full visual and fuze hole examination, and a percentage complete examination. It was thought that much more detailed reports on the results found from such re-inspection should be made, as this would be of great assistance to the Inspection Department in America. This

[1] HIST. REC./H./900/16.

recommendation was put into effect at an early date.[1] Colonel Kenyon, however, noted, in February, 1918, that insufficient detail was still given in reports on aeronautical supplies.

III. The Centralisation of Control, 1917 to 1918.

As has already been stated, one of the first results of Mr. Collinson's Mission was the confirmation of the appointment of Colonel Kenyon. It was further decided that the old system of communication with Woolwich on technical matters and administrative subordination to the "E. W. Moir Organisation" should be abandoned, and that the American Department should be directly under the control of the Director-General of Inspection of Munitions at home. A branch was established at the Ministry to deal with the work of inspection in the United States and Canada.

The organisation of the Inspection Department was continued with little change. The six main districts under the district inspectors were retained, and there was also a system of specialised inspection in connection with proof ranges, and for optical instruments, etc.[2] The inspection of small arms remained as before under Colonel Webley Hope, entirely independent of Colonel Kenyon, and aeronautical inspection and mechanical transport inspection were outside Colonel Kenyon's organisation. The mechanical transport section was placed under Colonel Kenyon for administrative and disciplinary purposes only early in 1917; the responsibility for the inspection of aircraft was finally allotted to Colonel Kenyon's department in September, 1917; and before the end of the year a section in charge of the inspection of small arms was included in the department.

The staff of inspectors and examiners was, in accordance with the recommendations of Mr. Collinson, increased, reaching a maximum in March, 1917, of 2,538 men and 192 women. The increase was justified by the improvements effected during the early months of 1917 in the quality of the munitions shipped. These improvements were no doubt due primarily to the changes in method resulting from the investigations made by Mr. Collinson in conjunction with Colonel Kenyon. The most conspicuous improvement was in graze fuzes. In December, 1916, rejections in this class of store, when re-examined at Woolwich and Perivale amounted to 20 per cent., but by the end of March the percentage had fallen to less than two. It is noteworthy that one firm engaged on the manufacture of fuzes paid a special visit to England, during this period, in order to study English methods and standards of accuracy. In the case of shell, the defects remained as before—low screw holes and, in the lighter natures, bad varnish; a decrease in the percentage of defective screw holes resulted from the reorganisation of gauge inspection by Colonel Kenyon in February,

[1] HIST. REC./H./900/16.

[2] Some indication of the scope of the work at the end of 1916 is given by the table in Appendix IX, which shows the weekly output of certain stores from each district.

1917. Changes were also made in the proof of nitro-cellulose powder. Further, the recommendations of Mr. Collinson in respect of the testing of steel were put into effect; the Inspection Department took over 5 per cent. of the tests, and arrangements were made that the firms' measurements should be carried out in the presence of an assistant inspector. There was, in consequence, an improvement in the quality of steel shipped from America during 1917, although the percentage of rejection—2·46—was still regarded as too high.

Again, in the early part of 1918 considerable difficulty was experienced in connection with shell steel and ship plates. It was found that some firms avoided the obligation to roll the shell steel to the Gothic section, with the result that the machining firms found it difficult to use the steel. A great deal of difficulty was caused by this matter, owing to the powerful influence of members of the large steel-making corporations. Finally, however, in June a compromise was arranged in conjunction with the United States Ordnance Department. The difficulty in the case of ship plates was to secure adequate inspection, some of the firms being of opinion that inspection on one side of the plates only was all that was necessary.

The difficulties experienced by the Bethlehem Steel Company in the production of satisfactory 9·2-in. howitzer equipment in May, 1918, was partly due to the greater elasticity of the American steel used for making the cradle. Colonel Symon was lent to the Inspection Department by General Headlam to assist in setting the matter right. An improvement was remarked in June.

During 1917 the orders for shell and fuzes placed in America were greatly decreased as compared with the previous year, and as the Inspection Department was informed that no further time fuzes would be ordered in America, the proof establishment at Cape May was broken up and the staff sent back to England. When, later in the year, an order for 1,000,000 No. 185 fuze was placed, arrangements were made for the firing proof to be carried out in Canada.[1]

Complaints were received from England in April, 1918, as to the quality of the machined crankshafts supplied by one firm, and the situation was complicated by disagreement between the inspection staff and the British aeronautical supply staff responsible to General Cormack. It was decided in May that the United States Signal Corps should take over from the joint British and American Aeroplane Inspection Department at Buffalo the inspection of American aircraft. The joint inspection had hitherto worked well, but it was thought that the financial and other control possessed over the firm in question would enable the United States Government to depend largely on the firm's own inspection. Captain Rogers retained control of the inspection of American naval boats. The transfer of work to the United States Signal Corps was complete by the beginning of June.

[1] Report of Inspection Department dated 10 December, 1917 (A.B./Gen./81).

During 1918 there was a considerable extension of chemical inspection work, and in August the Inspection Department was asked by the United States Government to undertake the inspection of the wood distillation products.

Later on, Colonel Kenyon protested against certain mechanical transport contracts being placed in accordance with which inspection would be carried out by the United States authorities instead of by the British Inspection Department; and against authority being given to the Purchasing Department to waive inspection where this was regarded as desirable. Already there had been an instance of the insertion of a clause into a contract for crankshafts to the effect that the Inspection Department should not be consulted as to the quality of the steel used. Sir Charles Gordon, however, regarded it as inevitable that American inspection should be relied on in the case of the mechanical transport contracts, since the goods were bought direct from the United States Government.

On the whole, the system of inspection in America and re-inspection in England appeared to work well. By 15 September, 1917, when the contracts for shell had been either completed or cancelled, about 13,000,000 empty shell had been supplied and only about one-half per cent. were found to be unserviceable, though over 1,500,000 required rectification after re-inspection in England. From the financial point of view the value of the stores rejected and the cost of rectification, up to December, 1917, amounted to £557,000, representing ·4 per cent. on a total value of £137,000,000.[1]

Some of the rejections were, no doubt, due to damage in transit, and the total financial loss was regarded as much smaller than the expense that would have been incurred in setting up in the United States a staff large enough to make a full examination. The question of recovering the value of the rejected stores from the contractors was raised by the Treasury, but in view of the fact that American contracts provided for payment on the result of inspection in America only, and the probability that many of the rejections were due to damage in transit, or to unnecessary rigour in re-inspection, and the general policy of keeping on good terms with American contractors, it was deemed politic to let the matter drop, and the Treasury sanctioned the loss being written off (28 May, 1918). Certain contracts for heavy natures, which had been shipped to England in advance of proof (May, 1916), fell into a different category, as the contractors had undertaken to make good any shell rejected if claims were preferred within six months; but the percentage of rejections was very small, and no claims having been preferred within the stipulated period the Ministry decided not to press the matter (12 April, 1919).[2]

[1] This includes Canadian stores. D.F. 3/P.A.C./37.

[2] M.F./Gen./51. D.F. 3/P.A.C./37.

Rejections of American and Canadian Shell and Shell Components, &c., upon Re-examination in England, up to 31 December, 1917.[1]

Description.	Quantity Shipped.	Purchase Value.	Rejected.	Rectifiable.	Approx. Cost.	Unrectifiable.	Purchase Value.	Approx. Scrap Recovery.	Loss.	Net Loss including Cost of Rectification.
		£			£		£	£	£	£
Shells, all natures ..	30,000,000	114,000,000	1,436,000	1,353,000	60,000	83,000	240,000	20,000	220,000	280,000
Fuzes Nos. 100, 101, 85 ..	27,157,000	13,538,000	2,964,000	2,351,000	58,000	613,000	257,300	67,550	189,750	247,750
Gaines	9,433,000	488,000	88,000	24,000	200	64,000	3,500	50	3,450	3,650
Friction Tubes ..	915,000	29,000	189,000	—	—	189,000	6,000	900	5,100	5,100
Forgings 4·5 ..	1,155,000	1,182,000	5,000	—	—	5,000	5,000	500	4,500	4,500
Small Arms Ammunition	1,236,032,000	8,110,000	6,391,000	—	—	3,000,000	23,000	7,000	16,000	16,000
		£ 137,347,000			£ 118,200		£ 534,800	£96,000	£438,800	£557,000

[1] D.F.3/P.A.C./37.

CHAPTER VIII.

NEGOTIATIONS WITH THE UNITED STATES GOVERNMENT REGARDING MUNITIONS SUPPLY, 1917—18.

I. Prices.

As has been seen the anticipated effect upon munitions prices of buying by the United States Government after it became a belligerent had led to the termination of Messrs. Morgan's Purchasing Agency.[1] At the time of Mr. Balfour's Mission the question of price control was being discussed but had not been decided at Washington, and one of the functions assigned to the Mission was to negotiate with the United States on the subject of the prices to be charged to the Allies. Some members of the Council of National Defence were so impressed by the difficulty of discovering a "fair price," that they suggested that it would be better to leave prices uncontrolled and compensate the Government by a very heavy excess profits tax. The Mission pointed out the undesirability of the adoption of such a plan from the Allied point of view. The difficulties of the United States Government in settling the question of the prices to be charged to the Allies was complicated by the fact that before the arrival of the Mission in America the Advisory Commission of the Council of National Defence had succeeded in persuading copper producers to sell to the Government at the low rate of $16\frac{3}{4}$ cents per lb., though they were not prepared to sell to the Allies at this price. The Mission received repeated assurances from unofficial sources that the President "would not hear of any suggestion that the Allies should be given less favourable terms than the American Government," but it was found impossible to get the matter settled while the Mission was in Washington.

After the departure of the Mission the negotiations were continued by Mr. C. J. Phillips. On 7 June, 1917, he cabled to the Ministry of Munitions :—

> "There is every indication that the policy of the U.S. Government will be to secure that prices arranged for basic materials shall be the same for European Allies as for U. S. Government itself. One of the chief difficulties which confront the Government here appears to be the widespread belief that the British Government have proceeded, and may continue to proceed, on quite other lines in fixing prices for materials supplied by Great Britain to her European Allies, *e.g.*, coal and steel, and that higher prices are being paid to British colonies than Great Britain will pay for similar materials in American market, *e.g.*, the purchase of copper in Australia is said to have been made at a price above the price then current in American market."[2]

---

[1] See above, p. 66.

[2] N.Y. 45619.

A reply was sent on 11 June describing the policy which had been followed by Great Britain, and it was demonstrated that there would be no divergence between British and American action.[1]

The matter was still unsettled when the British War Mission arrived. With regard to copper a move was made on 28 June, when information was received that copper producers were prepared to sell to the United States Government and Allies at 25 cents. This was not regarded as a satisfactory figure, but Sir Charles Gordon stated that "the broad question of making fixed prices by the Government for steel, copper, etc., was still unsettled and therefore for immediate delivery we may be compelled to accept prices named by producers."[2] On 10 July Sir Charles Gordon cabled to Dr. Addison that he had decided to stay in Washington for the time being, as the fixing of prices was being considered. The general opinion among Government officials seemed to be that the price fixed for the United States would apply to the Allies.[3] On 1 August Mr. Crosby, Assistant Secretary of the Treasury, urged that the system of Allied Purchasing through the American Purchasing Commission should be introduced as soon as possible, as this was the only means by which the United States Government could assist the Allies to secure reasonable prices. Mr. Crosby laid stress on the point that no legal power existed by which the Allies could claim the same prices as those which the United States Government ought to be able to obtain, and that no likelihood existed in the near future of that power being asked for from the United States Congress, but he thought that a great step in the way of the British Government obtaining the same prices might be taken through joint purchasing.[4] At a meeting on the following day, however, with the War Industries Board a more hopeful view was taken. The Board thought that they had adequate powers to deal with the situation and detailed a proposed procedure, which involved the principle of equal prices. The Board laid stress on the fact that the proposals for identical prices were conditional upon the other Allies charging both the United States and one another the same prices for all materials used for war purposes, drawing attention to the prices at which British coal was sold to the Italian Government and the prices paid for pig iron and copper to Canadian producers.[5] On 8 August the War Industries Board made an official statement to the effect that it would use all its powers to end "the extortion now exacted for many commodities of prime necessity" supplied to the United States Government, the Allies, and the consuming public.[6] Two days later a more definite statement was made in the Press to the effect that equal prices should be paid by the United States Government and the Allies.[7] The delay was becoming serious as no contracts could be placed pending a decision. The Minister had pressed the urgency of placing contracts for copper and spelter on July 25, and orders for 6-in. shell had to be placed.[8] The War Industries Board required the purchases to be made through

[1] L. 38152.
[2] N.Y. 47312.
[3] F.O. Tel. No. 1941 (HIST. REC./R/1141/50).
[4] N.Y. 49295.
[5] N.Y. 49295.
[6] D.M.R.S./518 E
[7] N.Y. 49468.
[8] L. 40205.

them, and they were unwilling that the prices asked by the manufacturers should be paid.[1] On 22 August Sir Charles Gordon reported that the Purchasing Commission had been appointed, but nothing had been done in the way of price fixing.[2] The question was at last decided on 20 September, 1917, the price of copper being fixed at 23½ cents per lb., which Mr. Brand reported to be a price very satisfactory to the copper producers. The price was subject to revision at the end of four months, and was dependent on certain conditions being observed—that wages were not to be reduced, that the Allies and the public were to pay the same prices as the Government, that the copper companies were to distribute the copper by direction of the War Industries Board, and that the companies pledged themselves to keep the production of copper up to the maximum so long as the war lasted.

On 12 October, the British War Mission were informed that the price of 6-in. shell steel had been fixed at 3½ cents per lb. Shortly afterwards, the prices of all shell steel, steel bars, shapes, plates, wire rods, coke, pig iron and coal were also determined, and subsequently prices of other materials were fixed, or altered to suit new conditions from time to time.

The War Industries Board, as has been seen, was from the first opposed to the placing of munitions contracts at high prices. The question of prices was again prominent during the negotiations regarding purchases by agents and sub-contractors; the high prices paid were one of the objections to the absence of control over such orders. Objection was raised on the same ground to the placing of orders for small tools with jobbers and dealers instead of with manufacturers direct.[3]

II. Priority.

The negotiations regarding the determination of priority proceeded at the same time as those regarding prices. This question also was discussed by Mr. Balfour's Mission, and Mr. M. S. Amos, who accompanied the Mission as one of the advisers on munitions problems, explained to various officers of the United States Government the working of the British priority system. When the price of copper was fixed in September, an understanding was reached that war demands should, under direction from the War Industries Board, receive full priority over other demands. By November, the priority system had been established and the routine by which applications were submitted was in full operation.

Negotiations for securing priority remained one of the functions of the Ministry's organisation in America down to December, 1918. No evidence has been found as to any difficulties in obtaining satisfactory priority ratings for direct Government orders.

---

[1] N.Y. 49570.
[2] N.Y. 49813.
[3] (*Printed*) *Weekly Report*, No. 154, X (10 August, 1918).

III. Supply of Raw Materials, Fuel, etc.

When work on the United States munitions programme began the question of the supply of materials required for the fulfilment of British orders became serious. The difficulty was experienced by all the Allies, and in the case of some materials the negotiations resulted in inter-Allied agreements for the distribution of available supplies.[1] The normal procedure with regard to such materials was the submission of probable requirements for the ensuing period of a year or six months by Sir Charles Gordon to the Purchasing Commission,[2] these requirements having been first placed before the Inter-Ally Council on War Purchases and Finance. Sometimes more lengthy negotiations were necessary, as in the case of pig iron and iron and steel products in July, 1918.[3]

In January, 1918, the critical condition of railway transport in the United States led to the issue of a fuel restriction order. It was required, in the interests of the supply of coal to railways, that all factories should be closed on Monday in each week from 25 January to 25 March, and that there should be an industrial holiday from 18 to 22 January. Certain exceptions were made from the operation of this order, but it was necessary for the Production Department to make special application in order to secure exemption for many firms holding British contracts.[4]

IV. Imported Materials to be used for War Purposes only.

On 6 October, 1917, Mr. Brand cabled to the Ministry[5] that the Purchasing Commission had stated on the previous day that they were having considerable difficulty, and expected to have more, in persuading American producers and manufacturers that materials supplied to the Allies of which there was a shortage in America were not being used for competitive industrial purposes by the Allies, either at once or after the war. The Commission wished to have authoritative information to counteract these suspicions. The point was raised in connection with copper, of which it was certain there would be a shortage, temporarily at least, for industrial needs. A reply was despatched on 12 October[6] to the effect that the Purchasing Commission was fully justified in assuring American producers and manufacturers that the materials were not being used for competitive industrial purposes.

The matter was raised again by Mr. McAdoo in January, 1918, this time direct with H.M. Treasury, and the question was referred to the Ministry of Munitions in so far as that Department was concerned, an assurance on the same lines being given.[7]

---

[1] *e.g.*, Wood distillation products. See above, p. 93.

[2] *e.g.*, Steel, spelter, aluminium, etc. (*Printed*) *Weekly Report*, No. 117, X (10 November, 1917).

[3] (*Printed*) *Weekly Report*, No. 162, X (5 October, 1918).

[4] Report of Production Department for January, 1918. (A.B./Gen./81.)

[5] N.Y. 53109.

[6] L. 42877.

[7] C.R.V./U./218; Hist. Rec./R./1141/28.

V. Exchange of Materials with the United States.

The importance of equipping the United States army and preparing it for the field as rapidly as possible led to the supply to the United States forces both in Great Britain and France of large quantities of munitions.[1] Except where allocations were made out of stocks which had accumulated in excess of requirements, any munitions produced for America had to be made either directly or indirectly at the expense of British needs,[2] and it was necessary therefore that some system should be established for the replacement of these materials. It seemed desirable that the munitions or munitions materials supplied by the United States in replacement should not be reckoned as part of the total quantity allowed against United States credits.

No definite procedure appears to have been formally accepted at this time (January 1918), but the United States War Department agreed, in February, to replace certain amounts of steel and lumber which had been supplied to the American forces in France.[3] No provision was made at the time for the shipping of these stores, and it became clear later that shipping was the determining factor, and that owing to shortage of transport the United States Government was not really in a position to guarantee immediate replacement.[4] Mr. Brand reported that he had experienced great difficulty in persuading the United States War Department to acknowledge the obligation to furnish these supplies from the United States. An undertaking, however, was ultimately given,[5] that 10,000 tons of steel plates would be shipped from the mills in March and April, and deliveries of the remainder of the material were promised as soon as possible.[6] Arrangements were later made for the replacement of 30,000 tons of ship-plates, 20,000 tons of lumber and 300 tons of pig lead.[7] Meanwhile negotiations as to replacements were being carried on by the Minister of Munitions, General Biddle, General Pershing, and others. On 29 May, 1918, certain proposals for settling the terms of replacement were outlined, and on 6 July General Pershing recommended their acceptance to the War Department.[8]

The procedure to be followed was announced by the Ministry on 17 June. Demands for the replacement of material were to be put before the American Board, and supported by the same details as in an ordinary request for supply ; the orders for their satisfaction, however, might be placed either by the British War Mission or by the American Government, this question to be left to negotiation between

---

[1] HIST. REC./R./1141/53.
[2] Memo. by Mr. Layton and Mr. Hanson, 10 January, 1918 (HIST. REC./R./1141/9).
[3] (*Printed*) *Weekly Report*, No. 129, XV (9 February, 1918).
[4] (*Printed*) *Weekly Report*, No. 133, XIV (9 March, 1918).
[5] See also HIST. REC./R./1141/61.
[6] Report dated 6 March, 1918. (A.B./Gen./81.)
[7] L. 52733.
[8] HIST. REC./R./1141/61.

the two parties concerned. Instead of any system of exchange, the United States Government should pay for supplies in England, and the Ministry for material in replacement provided from America, subject to any necessary financial readjustment. It was agreed that a replacement credit was not important from a supply point of view. In any case material in replacement of supplies to the American Expeditionary Force was only to be obtained from America if absolutely necessary. If the material could not be spared by America without damage to the Allied cause as a whole, the demand could obviously not be pressed, although it might be in replacement of supplies to the American Expeditionary Force.[1]

Matters, however, did not even then proceed absolutely smoothly, although the decision was in agreement with the views of Mr. Crosby, the president of the Inter-Ally Council on War Purchases and Finance.[2] On 23 July Sir Charles Gordon stated that it had not yet been decided whether replacement orders should be placed by the British War Mission or by the United States Government,[3] and there were many difficult points still outstanding when the Armistice was signed.

VI. Provision of Technical Assistance.

It was in the interests of the Allies as well as of the United States that the experience in technical matters gained in the years of war should be placed at the disposal of the United States Government. Hence there were attached to Mr. Balfour's Mission not only representatives of the Ministry whose functions were to secure the continuance of British supplies from America, but also experts whose function was to provide information on technical matters. Captain Leeming, of the Trench Warfare Department, for instance, took with him a large number of samples and drawings of which he gave exhibitions to members of the Ordnance Department, etc.

Several British officers were already in 1917 attached to various United States Departments in an advisory capacity, and these were, as has been stated above, placed under the control of the British Artillery Mission after its arrival in the United States in February, 1918. The work done by General Headlam, whose mission had originated in a request for assistance from the United States Government, is set forth in the series of reports made by him to the Minister of Munitions.[4] The sphere of his work was technical assistance in connection with artillery, tactical questions being dealt with by a French Mission; but the questions with which he dealt were largely determined by the action of the United States authorities in seeking advice. In a letter to the Minister, dated 6 March, 1918, General Headlam gave a list of

[1] (*Printed*) *Weekly Report*, No. 147, XII (22 June, 1918).
[2] Meeting of American Board, 21 January, 1918 (Hist. Rec./R./1141/20).
[3] N.Y. 79372.
[4] Washington Papers, 1–1–16, 2/3, and Hist. Rec./R./1141/45.

some of the subjects on which discussions had already taken place. A selection of them may be quoted :—

(1). General development in the tactical use of artillery and consequent technical changes.
(2.) Means of maintaining touch between the artillery at the front and the Design and Supply Departments.
(3.) Value of various natures of existing American guns for work in France, and methods of utilization.
(4.) Expenditure and probable requirements of ammunition.
(5.) Changes in the proportions of different natures of projectiles, fuzes, etc.
(6.) Casualties to artillery material.
(7.) Wear of guns and methods of diminishing it.
(8.) Repair of guns and carriages, organisation and work of field workshops, and provision and supply of spare parts.
(9.) Possibility of changing to the manufacture of the later marks of 8-in. and 9·2-in. howitzers.[1]

Colonel Leahy, one of General Headlam's officers, made tours of inspection of mobilization centres, ordnance depôts, magazines and wharves from which stores were shipped, and was able to give valuable advice, as he found that conditions were in many respects similar to those prevailing in England in 1914.[2] Colonel Symon, also, made tours of inspection of the works where orders for the United States gun programme had been placed, and made reports as to the conditions of production and the probability of deliveries. General Headlam reported that the expectations of the practical value of these tours had been more than realised, and that American officers seemed "daily more inclined to invoke our assistance in questions of speeding up production as well as of design."[3] General Headlam further brought to the notice of Mr. Stettinius on his appointment as Assistant Secretary of War, several instances in which it appeared that the necessity for keeping always in view the most economical utilization of the whole Allied resources in money, material, and labour appeared to have been overlooked; such as, for example, "the proposal to erect a very large new organisation for manufacture of small arms ammunition, the large orders for trench mortars and ammunition in contemplation."[4]

VII. Conclusion.

Upon the signing of the Armistice instructions were sent to the Department of War Supplies for the cancellation of large numbers of contracts. This work of cancellation was to be carried out by Sir Charles Gordon, in conjunction with Sir Hardman Lever, and the United States War Industries Board, who were to use their discretion as to whether in the event of heavy compensation being required it would be more profitable to allow the contracts to be completed.

---

[1] Washington Papers, 1–1–16, 2/3. [2] *Ibid.*
[3] Report dated 4 May, 1918. Washington Papers, 1–1–16, 2/3.
[4] Similar work was done by the Gas Warfare Mission, which is treated in detail elsewhere.

Contracts in respect of carnotite ore, bright steel, wire rods, electrodes, copper wire, tungsten products, and certain other specified stores were to be completed.[1] At the same time the United States authorities attempted to facilitate the return to peace conditions by the revocation of priority ratings. The work of the Department became from this time mainly the closing up of contracts placed or under negotiation; a few new contracts, however, continued to be placed.

It was decided that no applications for permission to purchase need be made to the Purchasing Commission after 10 December, 1918, and as from 16 December export licenses were necessary for shipment to Allied countries only in respect of certain articles. The business of the various departments was gradually brought to a close and the staff dispersed.

The enormous scale of the transactions that have been briefly reviewed is indicated by the fact that the expenditure of the Ministry of Munitions in the United States averaged £150,000,000 a year, involving in 1918 the importation of over 1,800,000 tons of stores and materials, or fifteen per cent. of the total munitions imports.[2]

United States manufacturers found unexpected difficulties in producing munitions which conformed to the very accurate limits laid down by British specifications, the stringent character of which was due to the fact that weapons and ammunition had to be built up from a large number of interchangeable components. This led at first to disappointing delays in deliveries, and a high percentage of rejections. These initial failures may have been due to some extent to the fact that experience of armament work was almost entirely confined to the Government arsenal. But once these preliminary difficulties had been overcome United States manufacturers were extremely successful in large scale production—as might have been expected in a country which is the home of mass production and automatic machinery, and which has no trade union customs restricting output—and their later deliveries were as satisfactory as their earlier ones had been disappointing.

The preceding pages have emphasised the value to the Allied cause of this practical monopoly of United States resources, and sketched the process by which the centralised machinery required for the proper utilisation of those resources was evolved. The three lines of development followed in that process of evolution have been outlined—purchase through an agent, a departmental organisation on the lines of the Ministry at home, and the inter-Allied arrangements from which emerged in the final stages of the war, their logical sequence, an inter-Allied organisation. Attention has also been drawn to another factor of considerable importance—the value of personal missions like those of Lord Rhondda, Lord Reading and Lord Northcliffe—which did much to facilitate elaborate and sometimes delicate and difficult negotiations.

---

[1] (*Printed*) *Weekly Report*, No. 168, X (A) (16 November, 1918).

[2] From the tonnage point of view the traffic with Spain and the Mediterranean was a more formidable problem than that with the United States and Canada. See Vol. VII, Part V.

APPENDICES

APPENDIX I.

(CHAPTER II, p. 6.)

The Morgan Agreement.

AN AGREEMENT made the 15th day of January, 1915, between His Majesty's Army Council and the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland (hereinafter called His Majesty's Government) on behalf of His Majesty of the one part and Messieurs J. P. Morgan & Company of 23, Wall Street in the City and State of New York, U.S.A. (hereinafter called the Commercial Agents) of the other part.

(1) The Commercial Agents will as from the date of this agreement place their services at the disposal of His Majesty's Government for the purchase of such goods and supplies as they may be instructed to buy in the United States of America.

(2) The Commercial Agents undertake in respect of the said purchase of goods and supplies to use their best endeavours to secure for His Majesty's Government the most favourable terms as to quality, price, delivery, discounts, and rebates, and also to aid and stimulate, by all the means at their disposal, sources of supply for the articles required.

(3) The relations between His Majesty's Government and the Commercial Agents shall be that of principal and agent respectively.

(4) The Commercial Agents are not to have any liability for delivery, quality, or prices of purchases, but are to be responsible solely as agents for their good faith and best endeavour.

(5) Full specifications will be supplied by His Majesty's Government through their duly accredited representatives, either directly or through Messieurs Morgan, Grenfell & Company, who will at all times have authority to act in London on behalf of the Commercial Agents. The responsibility of inspection to rest with His Majesty's Government, who will, if they think desirable, appoint representatives to inspect in the United States of America and accept on their behalf goods for shipment. The Commercial Agents shall co-operate fully at all times with the accredited representatives.

(6) The Commercial Agents will use their discretion in employing such buying corporations or experienced brokers to effect purchases as may seem to them to be in the best interests of His Majesty's Government, having due regard to deliveries, quality, and price.

(7) His Majesty's Government will repay to the Commercial Agents all commission, if any, paid to such buying corporations or brokers as may be employed; and His Majesty's Government shall receive all rebates, discounts, etc., which the Commercial Agents may be able to obtain.

(8) The Commercial Agents shall have general supervision over and will in every way facilitate prompt shipment of goods, making all necessary arrangements within their power up to and including the actual shipment.

(9) His Majesty's Government shall furnish the Commercial Agents with a list of all buyers of goods and supplies for the War Department now and from time to time acting for the said Army Council in the United States of America with full information regarding contracts already executed, orders now being filled and negotiations pending. All such buyers will be instructed to place themselves in touch with the Commercial Agents and to place no further orders (unless expressly instructed by His Majesty's Government to do so in particular cases) except through the Commercial Agents.

(10) The Commercial Agents shall, if required, facilitate the completion and shipment of orders now being filled, and shall, if required, assist in the completion of contracts now being filled and shall, if required, assist in the completion of contracts now being negotiated, but no commission shall be payable for these services unless His Majesty's Government expressly state that they will pay commission thereon in respect of any particular negotiation.

(11) His Majesty's Government shall pay to the Commercial Agents in compensation for their services a commission of two per cent. upon the net price of all goods and supplies purchased through them under this agreement until such net price shall amount in the aggregate to a sum of £10,000,000, and thereafter a commission of 1 per cent. upon any excess beyond such aggregate amount

of £10,000,000. His Majesty's Government shall pay at the outset the sum of £10,000 for outlays and as a retaining fee, which sum shall be credited against and absorbed by commissions as they accrue. The Commercial Agents will, as far as possible, purchase all goods direct from the manufacturer, and their commission before mentioned will be payable upon the net price of the goods delivered at the factory, less all rebates and discounts and exclusive of all commissions, freight and other out-of-pocket expenses. In the case of goods which it is found necessary to purchase either from manufacturers or from merchants, agents, or otherwise, on terms of delivery at some place other than the factory, the net price for the purpose of calculating commission shall be deemed to be the invoice price at the place of delivery, less all rebates and discounts, and exclusive of all commissions, freight, and other out-of-pocket expenses, provided that sea freight and all other expenses of or connected with shipment or transit by sea will, in every case, be excluded from the net price on which the commission of the Commercial Agents is payable.

(12) The Commercial Agents shall keep special books for the recording of all transactions connected with this agreement, and such books shall be open to the inspection of any officer or accountant appointed by His Majesty's Government for the purpose. Such extracts of these accounts as may be required shall be forwarded to London for inspection.

(13) Subject as hereinafter mentioned, it is the intention of the said Army Council that orders on behalf of the War Department shall be placed through the Commercial Agents for the purchase of any goods or supplies which it may be desired to purchase in the United States of America during the currency of this agreement except purchases effected by or through the Remount Commission or their agents. It is the intention of the Admiralty, with a view to secure co-ordination between the purchasing of Admiralty and War Department supplies of the same general character, to place their orders through the Commercial Agents upon the terms of this agreement so far as in their opinion they are able conveniently to do so without undue interference with their established channels of purchasing their requirements in the United States of America.

(14) The expressions of intention set forth in the last paragraph shall not in any way, however, be binding on His Majesty's Government, who expressly reserve the right to make purchases otherwise than through the Commercial Agents if in the opinion of the said Army Council or the Admiralty as the case may be there is good and sufficient reason for doing so. In so far as they may find practicable, and in order to avoid complications His Majesty's Government will keep the Commercial Agents fully posted as to purchases, if any, made otherwise than through them.

(15) Without prejudice to the generality of the provisions of the two last foregoing clauses, in cases where contracts providing for the delivery of specific goods at stated times and in agreed quantities have already been entered into, a further order for additional supplies, under an extension of such already existing contracts, involving no negotiations may be excluded from the operation of this agreement.

(16) It is understood that the Commercial Agents will not make any undisclosed profit directly or indirectly out of the purchases made through their agency, and in the event of the Commercial Agents being financially interested in the profits of any companies or firms from whom purchases may be made, a note will be attached to the record of the purchase for the information of His Majesty's Government, giving particulars of the interest of the Commercial Agents in such companies or firms.

(17) This agreement may be terminated at any time by either party by notice transmitted by post or cable to the other, the notice to take effect as from the time in ordinary course of post or cable delivery the same ought to reach the other. Notwithstanding such notice the Commercial Agents shall facilitate the carrying out, completion and shipments of all outstanding orders placed through them.

Any notice by or on behalf of His Majesty's Government may be signed by the Secretary of the War Office, or by the Secretary of the Admiralty.

As witness, etc.,

R. H. BRADE.
W. GRAHAM GREENE.
J. P. MORGAN & COMPANY.

APPENDIX II.

(CHAPTER II, p. 6.)

Memorandum of Treasury Meeting, 25 January, 1915.[1]

A meeting was held at the Treasury on Monday, 25 January, to consider the arrangements for remitting funds to America in connection with the contract of Morgan, Grenfell & Company, and sundry accounting points arising therefrom.

There were present Mr. Edward Grenfell and Mr. Whigham, of Morgan, Grenfell & Company, Mr. Ramsay, Mr. Blackett and Mr. Robinson of the Treasury, and Mr. Edwards of the Accountant-General's Department at the War Office.

Mr. Edwards explained that in respect of contracts made by the War Office before the Morgan contract was concluded an account was opened at the First National Bank, New York, on which General Benson and Mr. O'Keeffe, the War Office accountant, were empowered to operate. It was agreed that the balance of this account should be allowed to run off and that thereafter the whole of the banking arrangements in connection with pre-Morgan contracts as well as the new Morgan contract should be effected through Morgan, Grenfell and Company, in London, and J. P. Morgan, in New York. Mr. Grenfell stated that no friction would arise as regards the First National Bank from the adoption of this procedure.

As regards new arrangements it was settled that two accounts should be opened with the firm of J. P. Morgan in New York. The first would be operated upon by General Benson and/or Mr. O'Keeffe for the purpose of making payments due under pre-Morgan contracts.

General Benson or Mr. O'Keeffe would be instructed to inform the War Office from time to time of the sums that would be required to keep this account in New York in funds and the War Office would arrange to make the necessary remittances, spreading them as much as possible so as to avoid exchange difficulties, through Morgan, Grenfell & Company in London. The second account in New York would be a general account for the purpose of making payments maturing under the Morgan contracts, and the firm of J. P. Morgan would advise Morgan, Grenfell & Company in London of the sums required to keep this account in funds from time to time, again spreading the remittances so as to obtain the greatest advantage from exchange, and Morgan, Grenfell & Company would draw on the War Office for funds to cover the payments due in New York.

It was settled that all sums required at this end for feeding the New York accounts would be provided by the War Office, who would pay the amounts in question to the credit of the ordinary account of Messrs. Morgan, Grenfell & Company at the Bank of England, and Morgan, Grenfell & Company would remit these moneys to the New York house for the credit of either General Benson's account or for the Morgan account under the contract, as the case may be

Mr. Ramsay pointed out that under the Morgan contract Messrs. Morgan might have to effect purchases for departments other than the War Office, but in his view the payments in respect of purchases for such other departments would bear a very small proportion to the payments to be made in respect of supplies for the War Office. In these circumstances it seemed simpler that the War Office should undertake the task of making all advances necessary for purchases under the Morgan contract and should reclaim from other departments the cost of any supplies which had been purchased through Morgan for them.

---

[1] 0153/2039.

Mr. Edwards, of the War Office, fully agreed that this was the most convenient procedure. The alternative would be to feed the account of Morgan, Grenfell & Company at the Bank of England direct from the Treasury, who would then apportion the proper sums to the War Office and the other departments concerned. This alternative was dismissed. Mr. Edwards undertook that the War Office should issue the necessary instructions to Messrs. Morgan, Grenfell & Company and to General Benson and Mr. O'Keeffe in New York.

Two further points may, perhaps, be noted :—

(1) It was agreed that the Special Stores Account already opened at the Bank of England should be kept entirely distinct from the transactions discussed above, and Messrs. Morgan, Grenfell will continue to account for the former directly to the Treasury.

(2) J. P. Morgan & Company will be merely bankers as regards the Benson-O'Keeffe Account with them ; the firm will not examine the account or stores save in very exceptional cases where they have been ordered by the War Office to inspect, *e.g.* in the case of certain railway sleepers which have already been ordered.

APPENDIX III.

(CHAPTER II, p. 13.)

Letter from the Treasury to Ministry of Munitions, 24 March, 1916.[1]

Sir,

I am directed by the Lords Commissioners of His Majesty's Treasury to acquaint you for the information and guidance of the Minister of Munitions that Messrs. J. P. Morgan & Company having raised certain questions in regard to the interpretation of their contract of Commercial Agency with His Majesty's Government, the matter was discussed with representatives of the firm by the Chancellor of the Exchequer. An agreement was arrived at, which was expressed in the letters of 8th instant, copies of which are enclosed herewith.

I am to add that the firm took the same occasion of referring to the method by which instructions are given to their London Agents to request payment in the United States of America of accounts due by His Majesty's Government. No question appears to arise in respect of payments falling on the Commercial Agency Account in respect of Orders placed through Messrs. Morgan, or in respect of payments from the Treasury Account. In the former case directions are given by the Contracting Department without reference to this department, and this applies to orders placed by the British War Office on Russian account; in the latter, directions are given by the Treasury (with certain specified exceptions agreed between this department and the departments concerned). In this category fall payments to the New York Agents of the Russian and Italian Governments.

But I am to enquire what is the practice of your department in regard to payments from the Commercial Agency Account in respect of orders placed otherwise than through Messrs. Morgan. In certain classes of cases, the Treasury is notified before transfer is requested; but it does not appear whether Messrs. Morgan are ever requested to make such payments without reference to the Treasury, and, if so, in what class of case. My Lords think that the position should be regularised, and they will issue further directions on learning what is the practice at present followed by your department.

I am, etc.,

ROBERT CHALMERS.

The Secretary,
Ministry of Munitions,
Whitehall, S.W.

---

[1] 6744/16 filed in 0153/2371.

APPENDIX IV.

(CHAPTER II, p. 14)

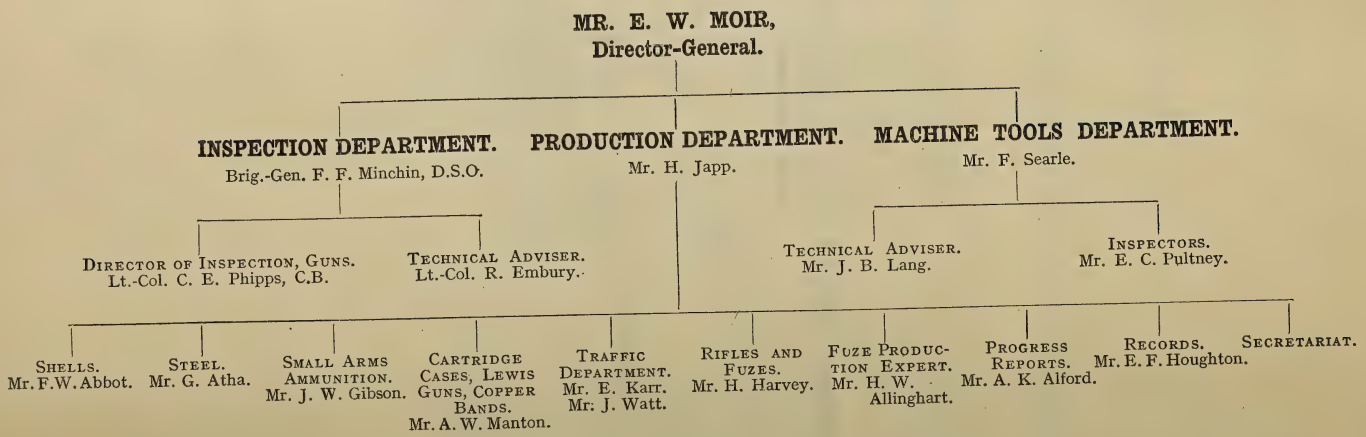
Approximate Value of Contracts placed by Messrs. J. P. Morgan and Company.

	To March, 1916.	1916–7.	1917–8.	Total.
	$	$	$	$
Ministry of Munitions	714,500,000	726,800,000	120,000,000	1,561,300,000
War Office	14,100,000	6,700,000	2,000,000	22,800,000
Admiralty	4,000,000	—	—	4,000,000
Allies	395,500,000	79,750,000	—	475,250,000
	1,128,100,000	813,250,000	122,000,000	2,063,350,000

APPENDIX V.

(CHAPTER IV, p. 48)

Organisation in the United States, May, 1916.



APPENDIX VI.

(CHAPTER V, p. 64.)

Anglo-American Agreement Respecting a Purchasing Commission in the United States.[1]

MEMORANDUM of an Arrangement entered into this 24th day of August, 1917, by the Secretary of the Treasury, with the approval of the President of the United States and Lord Northcliffe, acting for and on behalf of the Government of the United Kingdom of Great Britain and Ireland, hereinafter called the British Government.

THE following arrangement is entered into as one of the arrangements necessary or desirable for establishing such credits in the United States for the British Government as may from time to time be determined by the Secretary of the Treasury, with the approval of the President, under the authority of the Act of Congress approved the 24th April, 1917, or any subsequent similar act :—

(1) Bernard M. Baruch, Robert S. Lovett, and Robert S. Brookings are hereby designated a Commission through whom or with whose approval or consent all purchases in the United States of materials and supplies by or on behalf of the British Government shall be made.

(2) The British Government, from time to time, shall, subject to the provision of Article 4 hereof, communicate its requirements for materials and supplies to the Commission, through such person or persons as shall be from time to time designated to the Commission as empowered by the British Government to make purchases on its behalf.

(3) It shall be the duty of the Commission, subject to the provision of Article 4 hereof, to use their best efforts to obtain offers of the materials and supplies so shown to be required, at the best obtainable prices and terms, of delivery and otherwise, and to submit the same to the said person or persons representing the British Government, but it shall be no part of the duty of the Commission to prepare and sign contracts, or to supervise their execution, or to determine technical details, or to carry out the inspection of materials, all of which matters shall be the concern of the British Government. Said Government shall be under no obligation to make purchases of materials and supplies at the prices and upon the terms so submitted by the Commission, but it is agreed that it shall not, during the continuance of this arrangement, make purchases in the United States otherwise than through or with the approval or consent of the Commission. Such approval of the Commission may be given from time to time, according to the circumstances of each case, with reference to purchases of a specified general character, or specifically with reference to stated transactions; and the Commission may, according to the circumstances of each case, determine from time to time to give its consent, with reference to purchases of a specified general character or specifically with reference to stated transactions, that the same be made without the intervention of the Commission.

(4) Since other foreign Governments engaged in war with the enemies of the United States may have entered or may enter into similar arrangements with the Secretary of the Treasury, with the approval of the President of the United States, it is understood that all such foreign Governments shall agree among themselves as to their several requirements and as to the priorities of delivery desired to be observed as between them in respect of matters of major importance.

---

[1] Enclosure in Sir C. Spring-Rice's despatch No. 717, 31 August, 1917.

Such agreement may be arrived at by an inter-Allied Council sitting in Europe, or, pending the establishment of such Council, by representatives of the Allied Governments acting in the United States. The Commission, in making negotiations and arranging for deliveries, shall take into consideration the recommendations of such foreign Governments, so arrived at, and it shall be guided, so far as practicable, by such recommendations, as well as by the conditions existing in the United States with reference to the possibilities of production and manufacture and the requirements of the United States.

(5) The British Government shall use its best efforts to the end that this arrangement shall extend to and bind the dominions and dependencies of the British Empire beyond the seas.

(6) The Commission shall determine their own organisation and rules and methods of procedure, and may employ counsel and clerical assistance, all subject to the approval of the Secretary of the Treasury. The Commission shall be under no liability except in good faith to use their best efforts as aforesaid. The expenses of the Commission and their compensation, which together shall not exceed 150,000 dollars per annum, shall be borne by the British Government. It is understood that in the event of other foreign Governments entering into similar arrangements, such expenses and compensations shall be borne by each of them in proportion to the purchase of such foreign Government through the Commission.

(7) Any or all members of the Commission may be removed by the President of the United States, who may, from time to time, fill vacancies, and designate an additional member or members of the Commission, or reduce the number of members of the Commission.

(8) This arrangement shall continue until the expiration of ninety days after written notice shall have been given by the Secretary of the Treasury to the British Government, or by the British Government to the Secretary of the Treasury, of his or its desire to terminate the same; but in no case shall this arrangement continue beyond the termination of the war between the United States and its enemies.

(9) Any notice hereunder to the Secretary of the Treasury shall be deemed sufficiently given if delivered at the State Department in Washington, for transmission to the Secretary of the Treasury. Any notice hereunder to the British Government shall be deemed sufficiently given if delivered, addressed to said British Government, to its agent designated as herein provided, or at the Embassy of said Government in Washington.

10. Nothing herein contained, expressed, or implied, nor anything done or omitted by the Commission, shall impose any obligation or liability upon the United States, whether to advance moneys, to establish credits, or otherwise.

McADOO, *Secretary of the Treasury.*

(For and on behalf of the British Government),
NORTHCLIFFE, *Chairman of the British War Mission.*

APPENDIX VII.

(CHAPTERS VI and VIII.)

Comparison of Principal Manufactures during Specified Months, 1916 to 1918.

	January, 1916.	June, 1916.	December, 1916.	June, 1917.	August, 1917.	December, 1917.	June, 1918.
Small Arms Ammunition	Number. 45,600,000	Number. 52,500,000	Number. 50,039,000	Number. —	Number. —	Number. —	Number. —
Rifles	—	—	—	87,321	—	—	—
Shells of all natures	1,725,119	1,801,889	601,425	66,157	11,480	—	308,587
Shells in complete rounds	272,300	639,600	429,700	—	—	—	—
Shell Forgings, all sizes	267,054	114,556	429,220	379,750	163,114	146,551	—
Fuzes, all types	1,452,325	2,580,640	2,154,996	807,517	1,006,471	516,920	—
Cartridge Cases, 18-pdr. and 4·5-in.	1,421,050	1,621,544	—	—	—	—	—
Driving Bands, all types	300,400	691,070	1,607,428	536,973	234,468	—	—
Shell Steel	Tons. —	Tons. —	Tons. 37,698	Tons. 59,247	Tons. 107,546	Tons. 70,771	Tons. 23,174
Pig Iron	—	—	8,125	15,265	7,740	1,367	—
Non-Ferrous Metals	—	—	25,737	39,415	10,815	27,580	21,091
Tonnage shipped	42,000	72,000	166,000	211,796	309,265	180,145	140,870

APPENDIX VIII.

(CHAPTER VI, p. 82.)

Imports of Munitions and Munitions Material from the United States of America, January to December, 1918.

Description.	Imports from U.S.A.	Total Imports from all sources.
	Tons.	Tons.
Iron Ore	—	*6,565,860*
Other Ores, etc.—		
Manganese Ore	—	316,471
Magnesite	—	42,493
Total	—	*358,964*
Finished Munitions—		
Guns and small arms	6,506	6,516
Shells and rounds	67,351	521,974
Shell components	1,480	26,869
Total	*75,337*	*555,359*
Ferrous Metals, etc.—		
Shell steel	660,660	666,077
Shell forgings	30,179	62,793
Stampings and bars	778	778
Pig iron	102,959	141,979
Swedish steel	—	22,822
General steel (U.S.A.)	63,307	63,307
Ferro-silicon	2,585	25,053
Total	*860,468*	*982,809*
Non-Ferrous Metals, etc.—		
Aluminium	1,076	10,075
Bauxite	—	56,648
Copper	136,288	213,879
Copper ore and regulus	—	37,704
Lead	74,411	212,181
Spelter	54,695	65,816
Miscellaneous	33,796	337,132
Total	*300,266*	*933,435*
Explosives and Explosives Material—		
Toluol benzine	—	96,678
Nitrate of Soda	—	533,600
Pyrites	—	794,073
Sulphur	12,958	75,644
Phosphate rock	22,512	460,926
Cordite	—	8,586
N.C.T.	43,018	51,838
Miscellaneous	32,479	79,316
Total	*110,967*	*2,100,661*

APPENDIX VIII—*contd.*

Description.	Imports from U.S.A	Total Imports from all sources.
	Tons.	Tons.
Lubricating Oils and Wax	*311,526*	*311,526*
Miscellaneous—		
Railway materials	19,188	19,376
Mechanical transport supplies	24,017	24,017
Aeronautical supplies	2,939	3,005
Machine tools	38,478	38,853
Agricultural machinery	62,746	72,946
Rubber	—	11,164
Total	*147,368*	*169,361*
GRAND TOTAL	**1,805,932**	**11,977,975**
Percentage to Total	15·2	100

APPENDIX IX.

(CHAPTER VII, p. 101.)

Inspection of Munitions: Approximate Weekly Output of Certain Stores in each District, December, 1916.[1]

District.	H.E. Shells.					Forgings.					Steel (tons).	Driving Bands.	Fuzes.	
	12-in.	9·2-in.	8-in.	6-in.	60-pdr.	12-in.	9·2-in.	8-in.	6-in.	4·5-in.			No. 101.	No. 85.
Bethlehem, Pa.	—	400	—	—	—	—	—	—	—	30,500	—	—	—	32,000
Philadelphia ..	3,700	—	—	12,300	—	—	—	2,000	—	9,500	—	—	35,000	42,000
New York ..	—	450	—	—	5,800	—	1,250	—	—	—	—	83,000	3,500	10,000
Waterbury ..	1,000	—	—	2,200	—	—	—	—	—	—	—	59,000	331,500	181,000
Pittsburgh ..	1,650	27,500	40,000	21,000	33,000	3,000	6,000	16,000	23,500	3,000	4,700	50,000	51,000	—
Chicago, Ill. ..	—	700	13,700	10,000	—	—	—	3,600	—	—	4,700	—	—	—
Total Weekly Output ..	6,350	29,050	53,700	45,500	38,800	3,000	7,250	21,600	23,500	43,000	9,400	192,000	421,000	265,000

[1] Many important stores are entirely omitted, *e.g.*, 9·2-in. howitzers and mountings; 4·5-in., 18-pdr. and 13-pdr. guns, carriages and limbers at Bethlehem; 8-in. howitzers and mountings at Philadelphia; explosives, miscellaneous metals (Pig Iron, Aluminium, Spelter, Brass Rod), etc.

APPENDIX X.

Supply of Munitions and Materials from the United States of America, 1914–18.

Store.	1914	1915	1916	1917	1918	Total.
	(*Figures represent numbers*).					
Gun Bodies (Arrivals in U.K.).						
Light.—						
13-pdr. 6-cwt.	—	—	100	—	—	100
18-pdr. I. and II.	—	189	246	260	156	851
12-pdr. 6-pdr. 2-pdr. Davis	—	—	52	—	—	52
Medium.—4·5-in. How.	—	—	—	150	—	150
Very Heavy.—						
8-in. How. VI.	—	—	—	96	4	100
9·2-in. How. I.	—	—	—	90*	53	143
Total	—	189	398	596	213	1396
Gun Carriages (Arrivals in U.K.).						
Light.—13-pdr.	—	—	11	89	—	100
18-pdr.	—	174	339	137	—	650
Medium.—4·5-in. How.	—	—	—	150	—	150
Very Heavy.—						
8-in. How. VI.	—	—	—	92	8	100
9·2-in. How. I.	—	—	—	50	84	134
Total	—	174	350	518	92	1,134
*Empty Shell** (Arrivals in U.K.).						
Light.—						
13-pdr. H.E.	—	162,600	278,600	—	—	441,200
S†	—	—	66,500	427,000	—	493,500
18-pdr. H.E.	—	800,700	7,885,700	36,800	—	8,723,200
S‡	—	1,830,800	6,800,900	622,400	—	9,254,100
Medium.—						
60-pdr. H.E.	—	—	216,400	17,300	—	233,700
S.	—	—	533,800	100	—	533,900
4·7-in. H.E	—	33,700	290,300	7,000	—	331,000
S.	—	22,100	88,200	13,200	—	123,500
4·5-in. H.E.	—	384,700	2,072,600	3,800	4,900	2,466,000
5-in. H.E.	—	155,200	485,100	—	—	640,300
Heavy.—6-in. H.E.	—	142,100	997,500	1,472,800	1,471,500	4,083,900
Very Heavy.—9·2-in. Gun H.E.	—	—	—	1,000	—	1,000
12-in. Gun H.E.	—	—	—	2,300	—	2,300
8-in. How. H.E.	—	14,300	581,000	1,035,600	31,100	1,662,000
9·2-in. How. H.E.	—	7,400	497,100	914,000	17,500	1,436,000
12-in. How. H.E.	—	—	100,300	92,600	—	192,900
15-in. How. H.E.	—	—	3,400	400	—	3,800
Total Light	—	2,794,100	15,031,700	1,086,200	—	18,912,000
Medium	—	595,700	3,686,400	41,400	4,900	4,328,400
Heavy	—	142,100	997,500	1,472,800	1,471,500	4,083,900
Very Heavy	—	21,700	1,181,800	2,045,900	48,600	3,298,000
Grand Total	—	3,553,600	20,897,400	4,646,300	1,525,000	30,622,300
Rifles. (Acceptances by Inspection Department)	—	—	373,282	870,283	—	1,243,565
Small Arms Ammunition. (Acceptances by Inspection Department).						
Mark VI.	15,780,000	22,340,000	25,200,000	1,140,000	—	64,460,000
Mark VII.	1,700,000	155,850,000	528,680,000	175,200,000	270,000	861,700,000
Total	17,480,000	178,190,000	553,880,000	176,340,000	270,000	926,160,000
Aeroplanes and Flying Boats (Quantities "handed to Services.")						
Aeroplanes (Two Seaters)	—	210	251	200	—	661
Flying Boats.	4	54	—	47	100	205
Total	4	264	251	247	100	866

*Figures are not available for gun ammunition components.
†Figures for 13-pdr. S. include 427,000 complete rounds.
‡Figures for 18-pdr. S. include 4,476,900 complete rounds.

Appendix X—*contd.*

Store.	1914	1915	1916	1917	1918	Total.
*Aero-Engines** (Quantities "handed to Services")						
90-h.p. Curtiss	—	28	144	806	1,231	2,209
400-h.p. Liberty	—	—	—	—	1,074	1,074
200-h.p. Sunbeam Arab	—	—	—	—	116	116
Total.	—	28	144	806	2,421	3,399
	(*Figures represent short tons*).					
High Explosives (Arrivals in U.K.).						
Picric Acid	—	483†	81	882	—	1,446
T.N.T.	—	900†	5,326	6,032	—	12,258
Ammonium Nitrate	—	—	65	7,535	2,047	9,647
Total.	—	1,383†	5,472	14,449	2,047	23,351
Propellants (Arrivals in U.K.).						
Cordite	—	2,000†	12,230	8,030	—	22,260
N.C.T.	—	9,831†	34,863	98,228	48,881	191,803
Total.	—	11,831†	47,093	106,258	48,881	214,063
Explosives Materials. (Arrivals in U.K.).	(*Figures represent long tons*).					
Nitrates, pyrites, phosphate rock, sulphur, wood distillation products, etc.	—	88,576	86,691	82,612	74,964	332,843
	(*Figures represent numbers*).					
Mechanical Transport Vehicles (Arrivals in U.K.).						
Lorries, Heavy.	—	—	8,632§	5,254	2,269	18,630
F.W.D.	—	—		1,129	798	
Light.	—	—		225	323	
Motor Cars	—	—	5,099§	518	156	21,445
Ford Cars‡	—	—		1,420	2,243	
Ford Vans‡	—	—		6,900	4,008	
Ford Ambulances‡	—	—		584	517	
Motor Cycles	—	—	—	350	—	350
Caterpillar Tractors	—	—	690§	409	414	1,513
Total.	—	—	14,421	16,789	10,728	41,938
Railway Material.						
Locomotives, Standard Gauge	—	—	—	325	99	424‖
60-c.m. Gauge	—	—	133	462	—	595
Petrol Tractors	—	—	—	32	—	32
Total.	—	—	133	819	99	1,051‖
	(*Figures represent tons*).					
Machine Tools (Arrivals in U.K.).	—	20,465	32,693	25,685	38,478	117,321
Agricultural Machinery (Arrivals in U.K.)	—	10,472	11,859	27,017	62,746	112,094
Iron and Steel (Arrivals in U.K.)						
Shell Steel	—	—	268,683	1,064,212	690,839	2,023,734
General steel, pig-iron, ferro-silicon	—	651,351	399,747	363,732	169,629	1,584,459
Total.	—	651,351	668,430	1,427,944	860,468	3,608,193
Non-Ferrous Metals (Arrivals in U.K.).						
Aluminium, bauxite, copper, lead, spelter, zinc concentrates, nickel, tin, etc.	—	245,489	224,080	329,452	300,266	1,099,287
Lubricating Oils and Wax (Arrivals in U.K.)	—	240,188	232,024	219,199	311,526	1,002,937

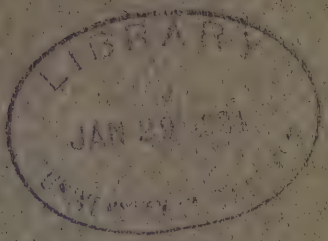
*Exclusive of spare parts.
†Figures for 1915 are approximate only.
‡Assembled in U.K.
§Figures represent approximately total imports up to the end of 1916.
‖A later return shows slightly increased totals:—Standard gauge locomotives 485; 60-c.m. gauge locomotives 595; standard gauge tractors 32; 2-ft. 6-in. gauge tractors 25; standard gauge track (second-hand) 76 miles.

Appendix X—*contd.*

Store.	1914	1915	1916	1917	1918	Total.
Summary of Imports.						
Finished Munitions*	†	54,526	547,521	348,349	75,337	1,025,733
Explosives and Explosives Materials		97,346	137,153	183,345	110,967	528,811
Mechanical Transport Vehicles		—	19,857	38,106	24,017	81,980
Railway Material		—	29,386	58,738	19,188	107,312
Machine Tools		20,465	32,693	25,685	38,478	117,321
Agricultural Machinery ..		10,472	11,859	27,017	62,746	112,094
Ferrous Metals		651,351	668,430	1,427,944	860,468	3,608,193
Non-Ferrous Metals		245,489	224,080	329,452	300,266	1,099,287
Lubricating Oils and Wax ..		240,188	232,024	219,199	311,526	1,002,937
Miscellaneous‡		—	—	3,514	2,939	6,453
Total.		1,319,837	1,903,002	2,661,349	1,805,932	7,690,121
Percentage of Total Munitions Imports		*12·5*	*15·2*	*21·6*	*15·2*	*16·2*

*Including gun ammunition components.
†No figure available for 1914.
‡Including aeronautical and optical supplies.

HISTORY OF THE MINISTRY OF MUNITIONS



VOLUME II

GENERAL ORGANISATION FOR MUNITIONS SUPPLY

PART IV

MUNITIONS ORGANISATION IN CANADA

1922

VOLUME II

GENERAL ORGANISATION FOR MUNITIONS SUPPLY

PART IV

MUNITIONS ORGANISATION IN CANADA

CONTENTS.

(5037) Wt. 24290/X3926 250 2/22 Harrow G.36

CHAPTER IV—*cont.*

CHAPTER V.

The Supply of Munition Materials.

CHAPTER VI.

Canadian Munitions Finance.

CHAPTER VI—*cont.*

APPENDICES.

CHAPTER I.

INTRODUCTORY.[1]

It was in August, 1914, that the War Office first appealed to Canada for assistance in providing munitions, and it was due to the energy of Sir Sam Hughes that Canada, although entirely without experience in munition making, immediately responded. The Shell Committee was formed in the manner explained in the following chapter,[2] and in the course of a year rapidly developed the production of munitions in Canada. By July, 1915, however, Mr. Lloyd George, who was then Minister of Munitions, came to the conclusion that it was desirable to ascertain more closely what the Shell Committee was doing, since contractors were very far behindhand, and Mr. D. A. Thomas (afterwards Lord Rhondda) was sent over by him for this purpose. Mr. Thomas came to the conclusion that the Shell Committee was not adequately organised for the great task that it had undertaken. Nevertheless, after spending some months in Canada, he was not able to reach an agreement with Sir Sam Hughes and the Canadian Government as to the character and personnel of any body which should take its place. Since, moreover, he wished to return to England, Mr. Lloyd George requested Mr. W. L. Hichens, Chairman of Messrs. Cammell, Laird & Company, to replace him. Mr. Hichens, accompanied by the Hon. R. H. Brand, who, with Mr. Lloyd George's permission, was associated with him in the work, left in October, and, after spending six weeks in Ottawa, succeeded in securing the resignation of the Shell Committee and replacing it by the Imperial Munitions Board, being assisted in the task of reorganisation by Sir Sam Hughes.

The manufacture of munitions in Canada had enormously developed in the course of 1915, and although the members of the Shell Committee had done most excellent work during their period of office, its organisation was quite inadequate for the task it had undertaken.[3] The representatives of the Ministry were fortunately able to secure for the work of the new Imperial Munitions Board the services of Mr. (later Sir Joseph) Flavelle, as Chairman, of Mr. (later Sir Charles) Gordon, as Deputy Chairman, of Mr. Edward Fitzgerald, who was then in the service of the Canadian Pacific Railway, of Mr. F. Perry, and of Mr. Edwards, as Chief Accountant. These gentlemen all remained with the Imperial Munitions Board during the whole of its tenure of office, and it was to their energy and ability in the main that the great success of the Board was due. Immediately after the formation of the Board Mr. Hichens and Mr. Brand left Canada in order to give the Board an entirely free field.

---

[1] This chapter is based upon a somewhat fuller review prepared by the Hon. R. H. Brand. (Hist. Rec./H./1142/10.)

[2] See below, pp. 6-12

[3] See below, p. 15.

During the course of its existence the Imperial Munitions Board spent over £200,000,000 of the British taxpayers' money. It provided between one-quarter and one-third of all the shells used by the British Army. It built both steel and wooden ships for the Ministry of Shipping, besides providing steel and other materials.[1] Its annual expenditure considerably exceeded that of the Canadian Government itself. Besides employing hundreds of contractors throughout Canada, it conducted huge factories of its own.

On his return to London, Mr. Brand was requested by Sir Joseph Flavelle to look after the interests of the Board in London, and from March onwards he had his own office and staff in the Ministry of Munitions. The work of the Board's representative in England was of a peculiar character. It was his business to see that no friction or misunderstanding arose between the Ministry of Munitions, the Ministry of Shipping and the Treasury in England on the one hand, and a great organisation, 3,000 miles away, carrying on this huge work and spending many millions every month, on the other. In the course of three years the office sent and received 16,000 cables. Naturally, owing to the difficulties of conducting business at a great distance many opportunities of friction arose. It was necessary not only to keep the Board in Canada fully informed, but, a more difficult task, it was necessary to see that Canada got proper treatment from all the different departments of the Ministry, that orders were not placed in the United States which might equally well have been placed in Canada, that when the Ministry's programme was made up for a period many months ahead, as was always necessary, the task that Canada was to perform was fully considered and determined upon, and, lastly, that proper financial arrangements were made to provide the Board with the necessary funds.

In the first year or so of the war the possibilities of munition making in Canada were not fully recognised in England, and very large orders were placed in the United States which it would have been to everyone's interest to place in Canada. When once a huge programme had been started in the United States it was a matter of some difficulty and many months to get it transferred to Canada. Other British Departments similarly undervalued the great assistance that Canada could render. For some months Mr. Brand urged unsuccessfully on the Board of Trade that Canada could build ships to assist in meeting the submarine crisis, and on the War Office and the Admiralty that Canada could provide not only aeroplanes, but an air force. Even in December, 1916, the Board of Trade stated that they did not require any ships from Canada, and it was only after the Ministry of Shipping was formed that the Board was authorised to begin a shipbuilding programme in Canada. Similarly, it was only when the Air Board, the forerunner of the Air Ministry, was formed that serious attention was given to the possibilities of Canada in this direction. Shortly after the first meeting of the Air Board a programme was agreed upon; the Board was instructed to begin building aerodromes and

[1] See below, Chap. V.

aeroplanes, and the Air Ministry took steps to start, in conjunction with the Canadian Government, the Canadian Air Force, which later supplied so many pilots.

One of the most interesting and difficult aspects of the Board's work was its financial problem.[1] From the very first there was difficulty in providing the sums necessary to meet the Board's great expenditure, and as the war went on the problem of providing American dollars to meet American expenditure, and Canadian dollars to meet Canadian, became one of the most pressing of the problems of the British Government—a problem, indeed, which, had it not been for the entry of the United States into the war, might have had a deciding influence on the whole course of the struggle. When in Ottawa, Mr. Hichens and Mr. Brand formed the opinion that the Canadian Government should itself finance, on behalf of the British Government, at any rate a very large proportion of the Board's expenditure. Canada had hitherto always been a borrowing country. She had borrowed before the war some £40,000,000 a year from England, and it required a great effort of imagination on the part of the Canadians to realise not only that they were to cease borrowing from England, but that they were actually rich enough to lend her large sums of money. Such a development had, in fact, never crossed their minds. While in Canada Mr. Brand urged publicly in speeches before the Canadian Clubs at Montreal and Ottawa that it was the duty of the Canadian Government and people to lend money generously to the British Government in order to finance the munition programme, and, while the representatives of the Ministry were still in Ottawa, the Canadian Government announced that they had decided to lend $50,000,000 to the British Government for this purpose. A little later, as is fully explained in one of the following chapters,[2] the Canadian banks came forward with another large credit, and in later months the Canadian Government and banks continued to supply large sums of money.

Nevertheless, the financial position of the Board was always difficult and often acute, and constant negotiations with the British Treasury at home and the Minister of Finance in Canada were necessary. It was natural that the Canadian Minister of Finance should disclaim responsibility for the Board's expenditure. The scale of that expenditure had been determined entirely by the British Government, to which the Board was solely responsible, and it was the duty of the British Government to provide that its expenditure should be duly met. On the other hand, the exigencies of war had forced the British Government into incurring both in the United States and in Canada obligations far greater than they could meet by their own unaided resources. In America, indeed, the British Government gambled on being able somehow or other to raise the money required from the American financial community; a gamble which would certainly have failed, had not the United States come into the war. In Canada, perhaps naturally, the British Government assumed that the Canadian

[1] See below, Chap. VI.

[2] See below, p. 59.

Government would strain every nerve that the munition programme which the Ministry of Munitions thought necessary for the safety, not only of the British, but also of the Canadian Army, should not fail for want of funds. The Canadian Government and banks responded nobly to the task, but the former were naturally concerned to make it clear that the aid they gave was of a voluntary character and that they could not be committed to financial obligations the extent of which they had no means of controlling. In the end, by the joint efforts of both Governments, through the assistance also of the Canadian banks, and owing to the fortunate entry of the United States into the war, the task was accomplished, and all the commitments of the Board were punctually fulfilled, though it was found necessary towards the end to curtail the Board's programme.

In the first half of 1917 the Ministry of Munitions decided, as did all the other Allied Governments that, owing to the entry of the United States into the war, it was necessary to have a representative of the Department at Washington, in order to deal with the United States Government direct, and to control the activities of all the Ministry's departments there. Sir Charles Gordon, who was then in England, was appointed as representative at Washington. Mr. Brand accompanied him and remained in Washington until April, 1918, Mr. Perry representing the Imperial Munitions Board in London during his absence. During the last months of the war—from April to October, 1918—the financial position of the Board was easier, as its programme had been reduced, and as the United States Government was by that time providing the British Government with large dollar credits in New York.

The Imperial Munitions Board may be regarded as a notable experiment in Imperial co-operation. It was not, however, so much an example of co-operation between two Governments, *i.e.*, the British and Canadian Governments, as between the British Government and a great Canadian organisation directly responsible to that Government. The experiment was indeed rendered easier by the fact that the Canadian Board was not a political body, responsible to the Canadian electorate, but a purely executive body, responsible to and financed by the British Government. It could, therefore, afford to ignore and, thanks to the determination of its chief officers in Canada, it succeeded in ignoring politics and regarding every problem before it from the single standpoint of efficiency and good service.

Mr. Brand's experience as the Board's representative in London demonstrated the necessity of an effective liaison service. If the Imperial Munitions Board had had no responsible representative of its own in London, charged with the duty of interpreting its wishes and wants and difficulties to the Ministry of Munitions, friction would have been constant and inevitable. The officers of the Ministry were overwhelmed with their own duties; they did not know Canada, or understand Canadian problems; they did not realise that cable correspondence between men 3,000 miles apart is the most fruitful mother of misunderstandings. The experience of the Imperial Munitions Board, therefore, should be of value in the consideration of the

wider problem of the relations between the different Governments of the Empire. So far as that experience is a guide, it points directly to the immense value of such a development as the appointment of resident Ministers of the Dominions stationed in London.

The spirit of the war-period assisted Sir Joseph Flavelle and his colleagues in their great work, and he has paid tribute to the splendid energy and skill of the Canadian munition-makers and their staffs. Nevertheless, the controlling hand was his, and perhaps the finest tribute to his services is the success of the Imperial Munitions Board. Further, after an examination of the Board's undertakings the Comptroller and Auditor-General reported, in 1920, that " excellent accounting conditions " prevailed and that it had not been considered necessary to make further local test examinations.[1]

[1] H.C. 97 of 1920.

CHAPTER II.

THE CANADIAN SHELL COMMITTEE.

I. Establishment of the Shell Committee.

Canada had been unable, even under peace conditions, to satisfy from domestic sources the requirements of her Militia, so that the outbreak of war found her completely unprepared to meet the need for expanded output. The Dominion Arsenal at Quebec, producing a small number of shell,[1] the Ross Rifle Factory, the Ottawa Car Company, engaged on a small order for 18-pdr. gun carriages, the Dominion Cartridge Company, just beginning to produce rifle ammunition, and the Canadian Explosives Company manufacturing a small quantity of military explosive, were the only establishments doing armament work. There were no facilities for manufacturing ammunition for the heavier guns needed for field service and for fortress and coast defence, nor for manufacturing the numerous parts essential to complete a round of ammunition.[2]

An early appeal for help was made to Canada by the War Office, on 24 August a cable was sent to Colonel Sir Sam Hughes, Minister of Militia, asking if his Department could provide, or obtain from the American trade, empty 18-pdr. shrapnel shell without cases or fuses. Colonel Hughes replied on the following day that large quantities and speedy deliveries could be obtained from the United States. At the same time he turned his attention to the possible developments of Canadian resources. On 2 September he convened a meeting of Canadian manufacturers likely to be interested in the production of shell, and placed the War Office inquiry before them. Colonel Lafferty, Superintendent of the Dominion Arsenal, was present and explained details of manufacture and inspection, and it was decided that the shells could be manufactured in Canada. Colonel Bertram was appointed chairman to the meeting (which resolved itself into an informal committee), with full power to act as a link between the manufacturers and the Minister of Militia in formulating some plan of organisation.

As a result of this meeting the Minister of Militia cabled to the War Office that Canadian manufacturers were turning their hydraulic presses to work on shell, and that a weekly delivery of 4,000 18-pdr. shrapnel could begin within four weeks' time, with an early increase to more than double that quantity. The question of price was not discussed. The War Office in reply, dated 3 September,

---

[1] In September, 1914, the rate of production of the Arsenal was such that it would have taken eleven years to complete the first order for 200,000 shells received by Sir Sam Hughes. (*Royal Commission on Shell Contracts, Minutes of Evidence*, Part I, pp. 32, 447.)

[2] Hist. Rec./R./1142/8.

asked for 100,000 18-pdr. shrapnel and 100,000 15-pdr. shrapnel without bursting charges or fuses, at the same time indicating that more could not be ordered, as the production of No. 80 fuses could not keep pace with the manufacture of shells.

Sir Sam Hughes, who was at this time at Valcartier Camp engaged in the organisation and equipment of the first contingent for overseas service, next proceeded to appoint the Shell Committee. There was a certain informality in the appointment of the Committee, and there was no specific definition of its functions and duties.

Having obtained War Office approval to the appointment of a committee of manufacturers strengthened by military experts, he summoned Colonel Bertram, Mr. Cantley and Mr. Watts[1] to meet him at Valcartier on 7 September, and on the same day they, as original members of the Shell Committee, held their first meeting. Colonel Lafferty was also appointed on 7 September, and immediate additions brought the Committee to its full strength as follows :—

Manufacturers.

Colonel A. Bertram (Chairman), Messrs. James Bertram & Sons, Dundas, Ontario.
Mr. T. Cantley, Nova Scotia Steel and Coal Company.
Mr. G. Watts, Canadian General Electric Company.
Mr. E. Carnegie, Electric Steel and Metals Company, Wallsend.

Representing the Militia Department.

Colonel Lafferty, Head of the Dominion Arsenal.
Colonel Benson, Master-General of Ordnance.
Colonel Harston, Chief Inspector of Arms and Ammunition.

Subsequent additions to the Committee were Mr. J. W. Borden (as finance member) and Mr. T. Carnegie, both in April, 1915.

An expert Ordnance Adviser, Mr. David Carnegie, late of Messrs. Hadfield, Limited, Sheffield, was appointed on 24 September by Colonel Bertram and Mr. Cantley, acting on the authority of the Minister of Militia.

The offices of the Shell Committee were at first established in Montreal, but were in May, 1915, removed to Ottawa.

General Bertram and Mr. David Carnegie were practically the executive officers of the Committee throughout its career. They devoted the whole of their time to its work and to them were entrusted the fixing of prices and the placing of contracts. The other members attended meetings and otherwise assisted in an advisory capacity.

The Shell Committee as an executive body occupied from the first a somewhat anomalous position. It was controlled by a department of the Canadian Government although, in theory, it possessed an independent character. Its contracts were not subject to the approval of the Canadian Government and all its expenditure was met by the

[1] The two last named were members of the informal manufacturers' committee mentioned above.

Imperial Government. Its responsibility to Sir Sam Hughes was not in his official capacity as Canadian Minister of Militia but as agent for the Secretary of State for War in Great Britain. Sir Sam Hughes himself said later that he attended but two of their meetings, one for the purpose of organisation and one for dissolution. " My injunctions to them were of the most general character and may be summed up in these three words : Speed, Prices, Canada."[1] These words, while certainly understating the work he did with and for the Committee, give nevertheless a correct impression of its real independence.

The method adopted by the Minister of Militia to define his position as agent for the British Government was, after consultation with the Prime Minister and the Department of Justice, to enter into contract relationship with the four manufacturing members of the Shell Committee in their capacity as private individuals. Three such formal contracts, arising from War Office orders, were eventually entered into on 1 October, 1914, on 20 October, 1914, and on 1 July, 1915, the last named including a schedule of all orders placed after 20 October, 1914.[2] The contracts were all drawn up in the same way as between Colonel Bertram, Mr. Cantley, Mr. Watts and Mr. E. Carnegie on the one part, and " Colonel the Honourable Sir Sam Hughes, His Majesty's Minister of Militia and Defence of Canada, acting for and on behalf of His Majesty's Secretary of State for War " on the other.

The position of these four members of the Shell Committee in relation to the War Office was theoretically that of ordinary contractors and carried with it the ordinary contractor's liability to profit and loss. It was not indeed, during the first few months, expected that the question of profit would arise and the Canadian Prime Minister appears to have given the Committee, on 19 September, an informal guarantee against loss.[3]

Each order on its receipt from the War Office was resolved into its component parts which were sub-contracted to manufacturers by General Bertram, acting on behalf of the Committee, described in the agreements with sub-contractors as " a body appointed by the Honourable the Minister of Militia and Defence in Canada for the purpose of purchasing munitions of War for the British Government." The raw material for carrying out the contract was in every case supplied by the Committee.

II. Contracts with the War Office.

Under the first of the three contracts made by the Shell Committee with the Minister of Militia (1 October, 1914) were included the earliest War Office contracts, dated 19 September, 1914, for 100,000 empty 18-pdr. shrapnel and 100,000 empty 15-pdr. shrapnel, asked for in the War Office cable of 3 September.[4] These were supplemented by further War Office contracts, dated 19 October, 1914, for 25,000 18-pdr. ammunition boxes, 25,000 projectile boxes and 100,000

[1] *Royal Commission on Shell Contracts, Minutes of Evidence,* Part II, p. 1215.
[2] See below, p. 9.
[3] *Royal Commission on Shell Contracts, Minutes of Evidence,* Part I, p. 461.
[4] A2. Returns No. 64, pp. 12, 20.

cartridge cases. These orders were embodied in the second contract (20 October, 1914) between the Shell Committee and Sir Sam Hughes.[1]

A schedule of all orders placed with the Committee by the War Office between November, 1914, and June, 1915, was included in the final contract with Sir Sam Hughes dated 1 July, 1915.[2] From November onwards the pressing demand of the War Office from Canada was for the complete round. At this time the Shell Committee had no practical experience as to the capacity of the Canadian manufacturers for producing the complete shell, though Mr. Carnegie had by this time visited most of the factories, which had undertaken shell work, and had been immensely impressed by the skill and ingenuity shown in overcoming initial difficulties as to the manufacture of steel and the treatment of shells. He therefore felt justified in urging that everything possible should be done to secure orders for shell. Both the Minister and the Committee believed that Canada was able to produce the complete round, which belief, combined with the ever-present fear lest orders should be diverted to the United States, impelled them to action.

Matters were precipitated by the report that an order for 2,000,000 18-pdr. shrapnel had been given to the Bethlehem Steel Company, and Sir Sam Hughes, on 10 November, offered the War Office on behalf of the Committee any reasonable quantity of shells up to 6-in. shrapnel or lyddite " as cheap and as good " as the Bethlehem Steel Company. The War Office in reply asked how many rounds of 18-pdr. ammunition, complete with shell, cartridge case, primer, fuse and propellant, could be supplied by 1 June. The fuse was from the first a source of difficulty in Canada and the Committee decided at this stage not to undertake to provide it. They therefore offered the complete round without the fuse, and, on 26 November, received an order for 200,000 18-pdr. shrapnel to be delivered at Halifax by 1 June, 1915. At the same time they received a continuation order for 400,000 empty 18-pdr. shrapnel. A month later a further contract was placed with the Committee for 1,650,000 fixed rounds of 18-pdr. shrapnel to be supplied at the rate of 150,000 a month.[3]

As regarded 18-pdr. H.E. the Committee offered 100,000 fixed rounds monthly, but negotiations were prolonged until the beginning of 1915, when Mr. Carnegie, who was at that time in England, obtained a formal contract, dated 15 January, for 800,000 rounds to be delivered at the rate of 100,000 a month.[4]

During this visit Mr. Carnegie had endeavoured to impress on the War Office the value of Canadian manufacture and was met by the promise of any amount of work if Canada could give the complete round. Special facilities were given him to see processes at Woolwich, where he investigated the manufacture of fuses. His attempt to obtain the services of an expert on fuses for Canada failed, but his

[1] A2. Returns No. 64, pp. 45, 49; *Royal Commission on Shell Contracts, Minutes of Evidence*, Part I, p. 33.

[2] *Royal Commission on Shell Contracts, Minutes of Evidence*, Part I, pp. 139–141.

[3] A2. Returns Nos. 37, 64, p. 8.

[4] A2. Returns No. 64, p. 9.

researches encouraged him to hope that, if the War Office would grant an order, it might be possible to begin fuse manufacture in Canada.

He was more successful in getting the War Office to consider the question of allowing basic steel for shell, since acid steel, the only material hitherto accepted for the manufacture of high explosive shell, was not made in Canada. After much discussion the War Office ultimately agreed to the use of basic steel as long as it answered to the required physical and chemical tests, and, after elaborate and costly experiments, Colonel Cantley, of the Nova Scotia Steel Company, succeeded in producing a quality of basic steel which, after exhaustive tests, was accepted by the War Office.

At the beginning of 1915 the progress made by the Committee was considerable ; seventy-two companies were engaged in machining and assembling shell, and sixty-seven were manufacturing components. The materials required for these orders, including 15,118 tons of steel, 2,600 of brass, 647 of copper and 10,550 of lead, had all, with the exception of copper, been obtained from the Dominion. By the close of January, 1915, 30,000 18-pdrs., which had passed government inspection and proof, had been shipped.[1]

On 10 February an order was received for 700,000 4·5-in. howitzer empty shell to be delivered at the rate of 50,000 rising to 100,000 a month, and on 13 February supplementary contracts were given for monthly deliveries of fixed rounds of 150,000 18-pdr. shrapnel and 100,000 18-pdr. H.E., respectively. On 2 April an order was also obtained for 300,000 60-pdr. H.E. shell, to be delivered at the rate of 50,000 a month.[2] But the Committee was still prevented by the fuse difficulty from offering the complete round. While in England Mr. Carnegie had, after some demur, obtained from the War Office an experimental order for 20,000 fuses on the terms that the cost of manufacture should be paid by the Shell Committee. This contract was offered to the Canadian General Electric Company but was refused for financial reasons. Various enquiries made in February, March and April came to nothing, but proposals made in March to the Committee by Mr. Harris on behalf of the Manufacturing and Contracting Company of Canada and submitted to the War Office ultimately resulted in a contract. On 7 April Colonel Bertram, in an interview with Sir Robert Borden, expressed his conviction that the experience gained by the factories during the last six months might lead to a considerable increase in output and reduction in price, if four or five million additional shells were ordered by the War Office. Sir Robert cabled to this effect to Lord Kitchener. No mention was made of the complete round in his cable, but, on 14 April, the Committee made a definite offer of this quantity of 18-pdr. shrapnel and 18-pdr. H.E., complete with fuse.

The War Office in reply offered a contract for five million complete rounds, to be divided into equal quantities of 4·5-in. howitzer lyddite, 18-pdr. shrapnel and 18-pdr. H.E., expressly stating that existing orders for fuses in the United States must not be interfered with.

---

[1] HIST. REC./R./1142/26. [2] A2. Returns No. 64, p. 17.

This contract was accepted by the Shell Committee and was to be completed by March, 1916.

When it came to sub-contracting for this order, the Committee very soon realised that it was impossible to produce the loaded time-fuses in Canada within the time required. They were therefore compelled to go to the United States for the fuses, justifying an action so avowedly opposed to their general policy on the ground that " every fuse placed in the States meant a shell for Canada."[1]

Negotiations with two American syndicates for the supply of 5,000,000 time fuses were carried on throughout April and May. On 28 May, Colonel Carnegie first became aware that one third of the shells were to be fitted with graze fuses, a type of fuse which undoubtedly could have been made in Canada within the required time. The matter had now become one of extreme urgency ; weeks had already been spent in fruitless negotiations as to the price of the time fuse, and Colonel Carnegie decided to avoid the further delay which would arise if the subject of manufacture in Canada were re-opened. The fuse contracts were accordingly allotted to two American syndicates, the International Arms and Fuse Company receiving an order for 1,666,666 graze fuses and 833,334 time fuses, while the 2,500,000 time fuses remaining to complete the contract went to the American Ammunition Company. The placing of these contracts, as will be seen, was to become the pivot of the adverse criticism later levelled against the Shell Committee.[2]

Some idea of the extraordinary increase in the work of the Committee that had taken place during the last two months is afforded by statistics drawn up for the period ; there were now 504 firms employed on munitions ; the total value of orders received from the War Office was $170,261,430, of which orders to the value of $102,000,430 had been placed in April and May, 1915 ; the deliveries of munitions and components to the Shell Committee up to 31 May were valued at $5,514,670·81, of which $701,361·58 had been delivered in April and May.[3]

These figures gave sufficient indication that deliveries were in arrears, a matter which was already occupying the attention of the Imperial authorities with regard to Canada. The system under which orders were split up into component parts lacked co-ordination as to rate of output ; at first this did not matter, as the rate was the maximum possible, but later some components outstripped others, with bad results. The great progress in the manufacture and completion of steel shell bodies blinded both the authorities and the public to the fact that, owing to the deficiency of other components of the complete round, deliveries of fixed ammunition were seriously behindhand.

Primers in particular were a difficulty, and Canada had been instructed by the War Office to deliver without them if necessary ; all of the 21,132 18-pdr. shrapnel fixed rounds delivered before 31 May, 1915, were without either primers or fuses. No shipment had been made at this date of 18-pdr. H.E. complete rounds. The early orders

[1] *Royal Commission on Shell Contracts, Minutes of Evidence*, Part I, p. 327.
[2] See Appendix I.
[3] *Royal Commission on Shell Contracts, Minutes of Evidence*, Part II, p. 1450.

for empty 18-pdr. shrapnel and 15-pdr. shell had, however, been delivered by the beginning of June.

On 23 June, 1915, Lord Curzon, replying to Lord Devonport on the question of orders placed in Canada for shell, had stated in the House of Lords :—

> " And I am bound to tell him, as regards Canada, to which he specially directed his remarks, that the delivery of shells from Canada under such orders as have been placed there has been unsatisfactory, and does not encourage orders being given on an extended scale to individual firms."[1]

This statement aroused great indignation in Canada, but as Mr. D. A. Thomas pointed out, at this date Canadian manufacturers had redeemed their promises of delivery to the extent of 2 per cent only.[2]

III. The Armaments Output Committee and the Supply of Munitions from Canada.

In April, 1915, the War Office Armaments Output Committee considered the question of the development of Canadian output. Canadian manufacturers had grievances directed both against the Imperial authorities and the Shell Committee. They complained that, at the beginning of the war, they had come over to tender for munitions and had been refused contracts. Reports, exaggerated in character, were current as to the extent of the war purchases in the United States, and there was a widespread feeling that the claims of the Canadian producer had not received sufficient consideration. The War Office had also been much harassed at a time of great stress by groups of Canadian speculators, who, with no factory equipment, endeavoured to obtain orders. It was difficult to discriminate between the genuine and counterfeit, and all offers connected with munitions were referred to the Shell Committee. Manufacturers complained that the Committee distributed a series of small orders which could be executed by the adaptation of existing machinery, rather than liberal orders justifying extension of plant and productive power.

On 5 May the Armaments Output Committee summoned the London representatives of Canadian railway, banking and engineering interests to a meeting to discuss these grievances. The question of bringing over suitable skilled labour from Canada to Great Britain, which was then being dealt with by the Munitions of War Committee,[3] was also discussed, and a resolution was passed that it would lead to unnecessary delay in the production of munitions. The point emphasised by the Canadian representatives and endorsed by the Committee was the importance of placing orders more freely and extensively in Canada ; she would then absorb her own labour, and machining and skilled labour would gravitate as required from the United States.

Other circumstances contributed to the conclusion arrived at by the Armaments Output Committee that the work of the Shell Committee

---

[1] *Parliamentary Debates* (1915), *H. of L.*, XIX, 111.
[2] HIST. REC./R./1141/5, p. 18.
[3] Vol. I, Part II, pp. 18–21.

should be reorganised and its scope enlarged. At this time the following arrangements for the purchase of supplies by the British Government from Canada were in operation :—

(*a*) Orders for munitions of war were placed through the Shell Committee.

(*b*) Orders for forage were placed by the Contracts Department of the War Office through the Canadian High Commissioner in London.

(*c*) Remounts were purchased by a Commission sent out from England under General Sir F. Benson.

(*d*) All other supplies were by recent agreement purchased through the agency of the Canadian Pacific Railway.[1]

In addition, the French and Russian Governments were making independent purchases in Canada.

Such conditions were bound to lead to overlapping and competition, and plans for reorganisation, drawn up for the Armaments Output Committee at this time, are interesting as embodying certain suggestions later carried out. In a memorandum dated 28 April it was proposed that the Committee should send out a representative to Canada, with two experts from the War Office, to form a committee of leading business men, to act in touch with Mr. G. M. Booth, with power to make contracts, purchase tools, spend money on contracts, etc. A month later a scheme was elaborated for the establishment of a Canadian Supplies Department, to be the sole purchasing agent for the British, French and possibly Russian Governments, by the amalgamation of the Hudson Bay Company's and the Canadian Pacific Railway's purchasing departments. Representative committees for this department were to be established in London and Canada and were to work in close co-operation with each other. The Shell Committee was to be represented on the new committee, but all new orders would be placed through this department. The chairman suggested for the Canadian Committee was Mr. Flavelle.

The further organisation and development of munitions production in Canada was one of the first matters dealt with by Mr. Lloyd George after his appointment as Minister of Munitions. On 4 June Dr. Addison handed him the Armaments Output Committee's memoranda, on 7 June he arranged to discuss the whole Canadian position with Sir Percy Girouard. On 12 June Mr. Booth, in a letter to Dr. Addison, pointed out that while Canadian resources had not perhaps been fully tapped, the orders which had been placed were badly in arrears and, in his opinion, contractors should be incited to raise their output to their

[1] Purchases falling under (*d*) had hitherto been made through a variety of agents, *e.g.*, foodstuffs were mainly bought through brokers in London, while orders for manufactured goods were in some cases sent to the Minister of Trade and Commerce. The arrangement with the Canadian Pacific Railway had been made partly from political reasons. The appointment of Messrs. Morgan as War Office purchasing agent in the United States had caused further dissatisfaction, as it was expected to lead to a substantial increase of business. It was hoped that this dissatisfaction would be allayed by a similar appointment in Canada, bringing the War Office in closer touch with Canadian production and opening up fresh sources of supply. (HIST. REC./R./1142/1.)

original promises before fresh orders were placed. By 23 June Mr. Lloyd George had decided to send Mr. D. A. Thomas on a mission to the United States and Canada. On that day he announced in the House of Commons:—

> "I felt, in consequence of the great importance of the American and Canadian markets and of the innumerable offers which I have received, directly and indirectly to provide shell munitions of war from Canada and the United States of America, it was very desirable I should have someone there who, without loss of time, which must necessarily take place when all your business is transacted by means of cable, should be able to represent the Munitions Department in the transaction of business there and find out exactly the position. . . . I propose to ask Mr. D. A. Thomas to go over to America for the purpose of assisting us in developing the American market. He will represent and exercise the functions of the Munitions Department, both in Canada and the United States. . . . Mr. Thomas will co-operate with the representatives of the Government, both in Canada and the United States of America. There is not the slightest idea of superseding our existing agencies there. They have worked admirably. They have saved this country, I believe, millions of money . . . . While invested with full powers, he will no doubt act in consultation with the authorities at home except in cases of urgency."[1]

On the same day, in the House of Lords, Lord Devonport raised the question as to the treatment accorded to individual Canadian firms, and cited specific instances where direct offers of large quantities of munitions had been declined. In reply, Lord Curzon (Lord Privy Seal), while explaining the method hitherto adopted, by which all offers were referred to the Shell Committee, mentioned that Mr. Thomas was on the point of going to America and Canada to see what changes or improvements in organisation could be effected.[2]

IV. Mr. D. A. Thomas' Mission.

Mr. Thomas arrived in America on 5 July; his intention had been to proceed straightway to Canada, but, owing to the absence in England both of the Prime Minister and of Sir Sam Hughes, he decided to defer his visit until their return. As their absence was prolonged beyond his expectation, and as the postponement of his visit was causing some public irritation in Canada, he went to Ottawa on 24 July without waiting for the return of the Prime Minister and the Minister of Militia.

Mr. Thomas, on his arrival, found that there was general uneasiness felt both by the Canadian Cabinet and the Canadian public as to the way in which the Shell Committee was discharging its functions. Suggestions were rife in the press that political influence was being exercised or that commissions were being demanded for the placing of contracts, and the recent exposures of graft in the Manitoban

[1] *Parliamentary Debates* (1915), *H. of C.*, LXXII, 1203.
[2] *Parliamentary Debates* (1915), *H. of L.*, XIX, 98–114.

Government and of corruption in the purchase of remounts for the Militia Department had prepared the public mind for further revelations. Investigations were to prove that the work of the Committee was entirely free from any taint of this nature, but were also to show that there was a pressing need for reorganisation.

In the first place, Mr. Thomas considered that the personnel and organisation of the Committee had become inadequate to the needs of the work, and his conclusion was borne out later by Mr. Hichens and the Royal Commission on Shell Contracts.[1] Their task, which from the outset was one of considerable magnitude, had by the summer of 1915 developed into a business requiring for its successful conduct a large and powerful organisation. Apart from the appointment of Mr. Riddell as financial adviser in May, 1915, there had been no attempt to expand the original organisation. All executive responsibility remained vested in General Bertram and Colonel Carnegie, who were snowed under by a mass of administrative detail which should have been delegated to subordinates. In this way Colonel Carnegie's value to the Committee as an eminent steel expert was seriously imperilled. In Ottawa, too, the Committee and their staff were very badly housed in the two upper floors of a building at some distance from the Militia Department. There was no waiting room at the Shell Committee's offices, and the landing and staircase were thronged daily with manufacturers or their representatives soliciting interviews with General Bertram or Colonel Carnegie.

Moreover, General Bertram had hitherto pursued a policy in placing orders which had for some time ceased to be the best adapted, from a business point of view, to meet the circumstances. The original order from the War Office had been comparatively small, for 200,000 empty shrapnel, and in order to spread the work where, owing to industrial depression, it was most needed, and to familiarise as many firms as possible with the process of shell manufacture, he split up the order into small quantities and assigned them to a number of different manufacturers. He continued the same policy when larger orders were received from the War Office, considering that to concentrate the work on the bigger firms would be prejudicial to the interests of the small firms and the smaller manufacturing towns. Mr. Thomas was of opinion that production would have been developed more expeditiously and satisfactorily if the larger firms had in the first instance been given large enough orders to warrant them equipping themselves so as to produce rapidly and on a large scale. It was, he considered, a sacrifice of business to a mixture of political and philanthropical considerations, and was excellently illustrated in the allocation of shell orders to British Columbia, which province had perhaps suffered most industrially from the war, and had also done better than any other province in recruiting men for the forces. This was recognised by the allocation of shell orders, although, in addition to the higher cost of labour in the province, there had to be added the heavy freight charges involved in the carriage of steel blanks or forgings over a

[1] Hist. Rec./R./1141/5, pp. 12, 14; *Report of Royal Commission on Shell Contracts*, pp. 20, 21; 94/Gen./226; Hist. Rec./R./1142/26.

distance of some 2,000 miles from Eastern Canada to the West and their return in the form of finished shells, owing to the fact that no steel was manufactured in the West and no forging plants or rolling mills were available. Political considerations may have made it worth the while of the Imperial Government to pay heavily for munitions in this case, but the policy as a whole was a leading factor in the irritation felt by the Canadian manufacturers against the Shell Committee.[1]

These grievances, together with evidence of inherent weakness in the organisation of the Shell Committee, were disclosed to Mr. Thomas as his mission proceeded. Between July and October he spent the greater part of his time investigating conditions in Canada. He made an extensive tour through Quebec, Nova Scotia and New Brunswick, where he visited the loading and assembling plant at Vandreuil, the Dominion Bridge and Canadian Pacific Railway Works at Montreal, the Dominion Arsenal and Ross Rifle Factory at Quebec, the Nova Scotia Steel and Coal Works and the Eastern Car Works at New Glasgow, the Nova Scotia Steel plant and the Dominion Iron and Steel Works at Sydney, and, in addition, smaller factories in these towns, in Halifax and in St. John, New Brunswick. He also visited Western Ontario and inspected a number of factories in Toronto and Hamilton.

Mr. Thomas acted in frequent consultation with Sir Robert Borden and Sir Sam Hughes after their return. The former from the first recognised the necessity of reorganisation; the latter was averse to drastic change; as he put it, the Shell Committee was his "baby" and had been a "model to the whole world."

Sir Robert Borden summed up his official views in a letter dated 9 September, to Mr. Thomas. After outlining the circumstances under which the Committee had been created, he stated that both he and the Minister of Militia had recently had under consideration an Order defining its powers and duties more precisely. The recent departmental reorganisation in Great Britain, resulting in the new Ministry of Munitions, combined with the enlarged scope of production in Canada, rendered it, in his opinion, desirable that the Committee should in future receive its authority and instructions from that Ministry.[2]

Meanwhile, Canadian manufacturers were clamouring for orders for larger shell, and had also taken up enthusiastically the possibilities of gun manufacture. Major-General R. H. Mahon, who had accompanied Mr. Thomas as technical adviser, submitted a comprehensive scheme for the manufacture of heavy ordnance in Canada to General Bertram and Sir Sam Hughes. It was adopted on 2 September at a large meeting of manufacturers, attended by Sir Robert Borden and Sir Sam Hughes.[3] A committee was appointed, and there was some question of its superseding the Shell Committee and

[1] HIST. REC./R./1141/5, p. 13. [2] C.R. 4504.

[3] The scheme contemplated the manufacture of two or three thousand guns which were to be assembled at a central government plant. For further details see HIST. REC./H./1142/4.

undertaking the responsibility for both ammunition and ordnance manufacture. All this happened during the absence, in New York, of Mr. Thomas, who was never very optimistic as to the capacity of Canada for ordnance work. The ordnance proposals were ultimately modified, but, after lengthy negotiations and further investigations carried on by Sir Frederick Donaldson, it was decided by the Ministry, on 16 November, 1915, having regard to the difficulty of providing superintendence and shop management and to the delay that was inevitable in getting machinery, that the idea of gun production in Canada should be abandoned.

Mr. Thomas had received general instructions from the Minister to place with Canada, in addition to existing contracts, orders for weekly supplies of 5,000 13-pdr. shrapnel, 8,000 60-pdr. shrapnel, 3,000 60-pdr. H.E., 22,000 6-in. H.E., and 6,000 8-in. H.E.[1] He seized the opportunity of these new contracts to persuade the Committee to adopt what he felt to be a strongly needed reform—the substitution of competitive tenders for the hitherto prevailing flat rate. He met with unexpected difficulty. The Committee maintained that, even apart from the general lack of experience, there was no common basis of competitive tender where no one firm undertook the whole number required; thirty or more different firms might undertake varying numbers, and the price was bound to vary. They wrote to Mr. Thomas, on 5 October:—

> "We have always considered it to be the business of the Committee to decide what prices should or should not be paid for any component part of the total article or articles placed with the Committee by the War Office.
>
> "We have had to pay at times more and sometimes less for component parts, but we have considered that so long as we supplied the completed article, passed and accepted by the proper authorities and at the price accepted by the War Office, no one had any right to criticise either the prices we paid for component parts or the methods adopted by the Committee in placing the work at these prices."

Mr. Thomas pointed out that whatever the position had been in the past, in future the purchasing organisation for munitions in Canada would be directly responsible to the Ministry of Munitions; the prices allowed hitherto had been too high, and the allocation of further orders would depend on the extent to which Canadian prices could be brought into line with others. In the first instance, the invitation of competitive tenders for large shell proved a failure, mainly because the Committee allowed it to be understood that these tenders would merely be used as a guide for fixing flat rates in the usual way.[2] The natural result

[1] Cable No. 7609, dated 4 September, 1915.

[2] Mr. Thomas reported that so little did the Committee appreciate the significance of this change of policy that they continued to place large continuation orders for 18-pdr. shrapnel on the old flat-rate basis in face of offers from some of the larger and more efficient manufacturers to undertake the work at considerably lower prices than those fixed by General Bertram. (Hist. Rec./R./1141/5, p. 17.)

was the submission of tenders so high that they could not be considered. After lengthy discussion of the principles involved, Mr. Thomas and Sir Frederick Donaldson finally overcame the reluctance of General Bertram and Colonel Carnegie to the competitive system, and tenders of which the Ministry was ultimately able to approve were submitted.[1]

Mr. Thomas felt very strongly that the question of a general reduction of the prices paid by the Shell Committee for component parts of ammunition was an urgently needed reform. The curious position, mentioned above, in which the Committee were acting as contractors to the War Office should be borne in mind. The component parts of the first and succeeding orders had been sub-contracted at prices which, when added together, in the majority of cases did not equal the price which the War Office had fixed for the whole article, so that before the close of 1914 General Bertram became aware that, so far from those four manufacturing members of the Committee who had accepted the responsibility of contractors running the risk of loss, there was likely to be a profit on the first order. They might, strictly speaking, have claimed to retain this profit, but it cannot be too clearly stated that it was never their intention to do so. General Bertram at first suggested that any surplus should be handed over to the Patriotic Fund, but it was eventually agreed by all four contractors that it should be handed over to the War Office on the conclusion of the contracts concerned. Not unnaturally they were inclined to claim a certain kudos for handing back a sum which, had their contracts been completed when they went out of office, would have amounted to something like $30,000,000.

Such a saving on a total estimated expenditure of $300,000,000 was considerable, but evidence pointed to greater economies which could have been effected. The flat rates at which components were sub-contracted often allowed of gigantic profits. Mr. Thomas instances the case of the machining of 18-pdr. shrapnel, which was let by the Shell Committee, in the first instance, at $5.15 per shell, reduced on the second order to $3.80, and on the third to $3.15, the current price in the summer of 1915. Mr. Thomas saw the cost sheets of an efficient shell factory in Canada which proved that the actual cost per shell was 94 cents, while the costs at the Dominion Arsenal (where, however, overhead charges were on a different scale from an ordinary commercial firm) worked out at 77 cents. The order for graze fuses placed with the American Ammunition Company at $4 each, which was more than double the price at which orders for the same fuses had been regularly placed in the United States by Messrs. Morgan, was another case in point.[2]

It should be pointed out in this connection that Mr. Hichens, as a result of his later investigations, gave a more guarded opinion as to the excessive prices offered by the Committee. Certain prices were, he allowed, too high and were being gradually reduced, and reduction might have come earlier. No doubt mistakes had been made, but, bearing in mind the novelty of the work, the urgency of the situation, which did not admit of cool deliberation or prolonged negotiations,

[1] HIST. REC./R./1141/5, p. 16. [2] HIST. REC./R./1141/5, p. 18.

and the fact that heavy amortisation allowance had to be made in respect of new plant, the difficult task of fixing prices had been well done. Mr. Hichens' opinion is also borne out to a considerable extent by the findings of the Royal Commission as to contracts placed by the Shell Committee,[1] based on the testimony of Mr. Charles B. Gordon.

At the close of September popular outcry was increasingly insistent in demanding reform, and was fed by a press loud in criticisms of the unbusinesslike methods of the Committee and the exorbitant profits of the manufacturers. The attitude of Sir Robert Borden now held up Mr. Thomas' plans of reconstruction, for, influenced by Sir Sam Hughes' extreme unwillingness that the Committee should be withdrawn from the jurisdiction of the Militia Department, he showed signs of going back on his expressed wish that the Ministry of Munitions should take over the Shell Committee. On 30 September Mr. Thomas cabled that there seemed little hope of doing more than strengthening the Committee by withdrawing members interested in contracts and substituting independent business men. A suggestion was made at this date by the Ministry and favoured by Mr. Thomas, that an organisation should be formed in Canada along the lines of the Export Department managed by Mr. Stettinius for Messrs. J. P. Morgan and Company. The department of the Canadian Pacific Railway under Mr. Fitzgerald, already acting as purchasing agent for certain supplies for the British Government, was obviously fitted for such a purpose, but serious opposition from political and trade interests would be aroused unless it was temporarily at least detached from the Canadian Pacific Railway. Sir Thomas Shaughnessy was prepared to agree to this dissociation, and a scheme was outlined under which Mr. Fitzgerald's organisation should be associated with a purely advisory committee, of which General Bertram and Colonel Carnegie should be members. It was held up pending the arrival of Mr. Hichens, whom the Ministry of Munitions had announced their attention of sending out as their direct representative in succession to Mr. Thomas, whose mission had already been prolonged and who was asking for his recall.

Meanwhile, the question of replacing the Chairman of the Shell Committee by someone unconnected with munitions contracts was being discussed. It seemed impossible to find a suitable person on the spot. The Ministry proposal that Mr. Hichens should come out as provisional Chairman was agreed to, unwillingly, by Sir Robert Borden, but meanwhile Mr. Hichens himself had refused, and in the end it was decided that no change should be made until after his arrival.

V. Reorganisation by Mr. Hichens.

Mr. Hichens' commission gave him very wide power in discussing with Sir Robert Borden the new organisation to be set up. The Minister pointed out that it should be essentially non-military and non-political, and suggested that reform should, as far as possible, move in the direction of a Munitions Supply Board, with a strong

[1] See Appendix I; *Report of Royal Commission on Shell Contracts*, p. 16.

chairman, four directors and a general manager, to which technical advisers and manufacturing experts should be attached for specific work. Mr. Hichens was also to investigate the position as to contracts already placed, to organise a system of weekly reports of progress and deliveries, and to enquire into the capacity of firms not employed, or only partly employed, on munition work.[1]

Mr. Hichens had requested that Mr. Brand should be associated with him in his mission and should accompany him. They arrived at Ottawa on 26 October. At this juncture, Sir Robert Borden, anxious to disarm popular clamour, had issued a public statement to the effect that the Committee was to be reorganised and placed under the direct control of the Ministry of Munitions. Meanwhile, the work of the Committee suffered owing to the prevailing uncertainty; in particular, decision as to the allocation of the orders for big shell had been deferred by Mr. Thomas until Mr. Hichens could be consulted.

From the first Mr. Hichens fully recognised the good work done by the Shell Committee, and emphasised the fact that any future reorganisation was rather a matter of normal evolution than of destruction and reconstitution. In his first interview Sir Robert Borden agreed as to the wisdom of effecting a gradual transition to the new regime. The following day, however, he urged Mr. Thomas to establish some new organisation at once before leaving the country. It was, however, impossible for Mr. Thomas to impose so hurried and unpremeditated a change, even had Mr. Hichens been prepared to accept it, for no details for reorganisation had yet been worked out. On their representations the Prime Minister once more returned to his former point of view, and agreed that a definite step such as he had suggested was premature until some concrete scheme had been established. Two days later Mr. Thomas left the country.

Mr. Hichens had intended to concentrate at first on reorganisation and not to interfere in placing the orders for large shell, but he speedily realised that the sums involved were so large and the opportunities for economy were so great, that he was bound to take part in allocating the work. This involved many complicated negotiations and much hard bargaining. "The Hotel," wrote Mr. Hichens, "is flooded with would-be shell makers, and we are besieged all day long with applicants for interviews, both here and at the Shell Committee's offices."

At the same time, this enabled Mr. Hichens and Mr. Brand to gain a very clear insight into the organisation of the Shell Committee, and to see, as Mr. Thomas had before them, that its weakness lay in the concentration of its executive organisation in the hands of the Chairman and Colonel David Carnegie, which resulted in a serious congestion of work. They investigated the accusations against the Chairman, and found them to be without foundation. His detractors had insinuated that no contractor could secure an order for shells unless he purchased his machines from Messrs. John Bertram and Sons, of which General

[1] D.D.G.(B)15.

Bertram was the President. "Suggestions of this nature are bandied about in Canada, and should not be taken too seriously," wrote Mr. Hichens.

After a fortnight at Ottawa, Mr. Hichens and Mr. Brand went to Montreal to learn at first hand the views of leading business men as to the reorganisation of the Committee. They had also to decide on whom they should select for the very difficult and arduous work entailed in the carrying out of such reorganisation, and in this connection they discussed with Sir Thomas Shaughnessy the possibility of securing the services of Mr. Fitzgerald, head of the buying organisation of the Canadian Pacific Railway. They afterwards visited Toronto, and before they left, had determined to invite Mr. Flavelle, Mr. Gordon and Mr. Fitzgerald to be the nucleus of a new organisation.[1] On 22 November, therefore, Mr. Hichens reported to the Ministry that, having thus obtained a fair measure of representative business opinion, he had now drawn up plans for reorganisation which he had discussed fully with Sir Robert Borden and Sir Sam Hughes, and which had been accepted by both of them.

The new scheme involved drastic changes, though, in accordance with Mr. Hichens' policy, some visible signs of continuity remained. The outstanding point was, that the existing Shell Committee was to resign and be replaced by a new Board, appointed by, and under the direct authority of the Minister of Munitions. This Board was to consist of a Chairman with full administrative and executive authority, a Deputy-Chairman and three or more members, leading representatives of Canadian commercial and financial life. General Bertram was to remain as Deputy-Chairman. There were to be five departments under the Board: (1) a Contracts and Purchasing Department, which it was hoped would be managed by Mr. Fitzgerald; (2) a Technical Department under Colonel Carnegie, who would be a member of the new Board; (3) an Inspection Department under Major Ogilvie; (4) a General Secretariat specially concerned in maintaining touch with the Ministry of Munitions; and (5) a Financial and Accounting Branch. Sir Sam Hughes was to be Honorary President of the New Board.

The whole scheme was discussed with Sir Sam Hughes, and agreed to by him before it was brought before the Shell Committee. He used his influence to get the members of the Shell Committee to accept it, with the result that on 29 November, they held their last meeting. They passed a resolution to the effect that all their rights and powers together with all moneys at their credit should be transferred to the British Government or anybody appointed by them, provided that they were released from all further liability and the British Government undertook to take over all the Committee's obligations.[2] They then placed their resignation in the hands of the Minister of Militia and Defence by whom it was accepted.

---

[1] It is interesting to note that the selection of Mr. Flavelle was made independently of the recommendation made in the memorandum drawn up by the Armaments Output Committee (see above, p. 13).

[2] *Royal Commission on Shell Contracts, Minutes of Evidence*, Part I, p. 171.

Mr. Hichens had diplomatically kept his scheme for reorganisation confidential until it was completed by the resignation of the Shell Committee, and it was not until 30 November, that an announcement of the forthcoming changes was made to the public press.

Mr. Hichens, in his letter of 25 November to the Minister of Munitions announcing the proposed reorganisation, summed up the case for and against the Shell Committee and their contractors, as follows :—

"In the early days the problem was to persuade Canadian manufacturers to undertake the work of making shells which was quite new to them, and presented formidable difficulties that caused many of the leading firms to hold back. The orders at that time destined for this country were on a small scale ; there was naturally no assurance of continuity in the work and the prospects of success were doubtful. The early pioneers therefore, who were prepared to face the difficulties were more influenced by motives of patriotism than the expectation of large profits. . . . The readiness with which they adapted themselves to a new industry is, I think, remarkable, and although, as in England, they have often been unable to live up to their original promises, yet they have nothing to fear from a comparison with the early efforts of the firms of the highest standing at home. . . .

"It is beyond question that the present organisation is not adapted to the changed conditions, and has not grown with the work. It is a pity that the reorganisation was not taken in hand some four or five months earlier when the increased volume of the work began first to make itself seriously felt, and I am convinced that no obstacle would have been placed in the way if more constructive suggestions had been put forward and there had been less destructive criticism. . . .

"The Shell Committee has been subjected to much unfair criticism. It was, as I have explained, appointed to deal with certain conditions and it has done this work honestly and well. It has called big forces into being and thus fulfilled the purpose then in view, but it cannot control these forces.

"I attach no importance to the sinister suggestions sometimes made (usually by an unsuccessful applicant for a contract) that favouritism has been shown by the Committee in the distribution of orders. This had been dealt with by the Chairman, General Bertram and Colonel Carnegie, and no informed person can doubt their high integrity and sincerity of purpose.

"I wish, therefore, to place on record that the Shell Committee have for the past fourteen months been carrying on a work of the most exacting and strenuous nature, and they have fulfilled their task with distinction. They have deserved well of the Empire and I hope this will be clearly recognised. I wish to add also that they have throughout received invaluable support and encouragement from General Hughes, whose foresight, enthusiasm and energy have contributed largely to the successful results obtained."

CHAPTER III.

THE IMPERIAL MUNITIONS BOARD.

I. Formation of the Board.

The Imperial Munitions Board, which was appointed on 30 November 1915, differed fundamentally from its predecessor, the Shell Committee, in its relations to the British Government. Unlike the Shell Committee, which had looked to the Minister of Militia, and therefore to the Canadian Government for its authority, the new Board, upon the suggestion of the Canadian Government, was directly under the authority of the British Government. It was appointed by Mr. Lloyd George, Minister of Munitions, with the approval of the Governor General of Canada and the Canadian Government, and was an agency of the Ministry of Munitions, directly responsible to it. Orders could only be placed by direction of the Minister, to whom questions of prices and conditions of contracts had to be referred. Payments were made in Canada out of funds provided by the Ministry through the Treasury, and accounts were rendered monthly after audit by a local firm of chartered accountants nominated by the Minister.[1]

The Chairman of the Imperial Munitions Board was Mr. J. W. Flavelle, one of Canada's best known business men and organisers, while General Sir Sam Hughes became Honorary President. General Bertram, who had been Chairman of the Shell Committee, joined the new Board as Deputy-Chairman, and on 21 January, 1916, Mr. C. B. Gordon was also appointed Deputy-Chairman.[2]

Colonel Carnegie continued to act as Technical Adviser. Care was taken to make the Board representative of the Dominion as a whole, and it was originally constituted as follows :—[3]

Chairman—Mr. J. W. Flavelle	..	President of the National Trust Company and of Messrs. William Davis & Company ; Director of the Canadian Bank of Commerce.
Deputy-Chairmen — Mr. C. B. Gordon	..	President of the Textile Company and Director of the Bank of Montreal.
Deputy-Chairmen — Gen. Sir A. Bertram	..	Messrs. James Bertram & Sons, Dundas.
Members — Mr. F. Perry	..	British Civil Servant ; Representative of Messrs. Lazard Brothers in Canada.
Members — Col. D. Carnegie	..	Late of Messrs. Hadfield, Sheffield.
Members — Mr. G. H. Dawson	..	Surveyor-General British Columbia, representing the West.
Members — Mr. J. A. Vaillancourt	..	Prominent French-Canadian ; President of Hocheles Bank.
Members — Mr. E. R. Wood ..	..	President of Dominion Securities Corporation.

The headquarters of the Board were at Transportation Building, Ottawa, and an inner executive consisting of Mr. Flavelle, Mr. Gordon,

[1] Hist. Rec./R./1142/3, 39 ; Hist. Rec./H./1142/2.
[2] D.D.G. (B) 46.
[3] Hist. Rec./R./1142/39.

Mr. Perry and Colonel Carnegie carried on the actual work of administration. Two members were subsequently added to the original number; in May, 1916, the Hon. R. H. Brand was co-opted upon his appointment as Representative of the Board in London, and in November, 1916, Colonel W. E. Edwards was given a seat as Director of Inspection of Munitions in Canada.[1]

II. Appointment of the Representative of the Imperial Munitions Board.

The method of communication between the Board in Canada and the Ministry of Munitions in London was soon found to be unsatisfactory. Hitherto all cables and despatches had been sent direct to the department of the Director of Munition Contracts at the Ministry, by whom they were distributed to the various branches concerned. But this system led to unnecessary delays and misunderstandings, and in March, 1916, it was abandoned, the Hon. R. H. Brand, who had helped in the organisation of the Board in Canada, being appointed its representative in London, with the understanding that in future all communications to or from the Board should pass through his hands. Two months later Mr. Brand was co-opted a member of the Imperial Munitions Board, with the approval of the Minister of Munitions.[2]

As soon as the new arrangement came into force, the Board ceased to cable or correspond directly with the Ministry, all communications being addressed to Mr. Brand as their Representative, who passed them on to the various departments concerned and transmitted the replies, when received, to the Board. Orders were still placed and contracts made, however, through the Director of Munition Contracts as before, as it was evident that the Representative of the Board could not both place and accept orders.[3] The advantages of the new system were soon apparent. Mr. Brand's knowledge of local conditions in Canada enabled him, in transmitting telegrams from the Board, to add necessary explanations and to clear up the misunderstandings incidental to cable correspondence. In course of time, the Imperial Munitions Board undertook to act in Canada on behalf of other Government Departments—the Ministry of Shipping, the Air Board, the War Office, the Admiralty and the Timber Controller (Board of Trade), and this correspondence was also carried on through the Representative.[4]

III. Administrative Organisation of the Board.

The great weakness of the Shell Committee had been over centralisation of the executive powers, which made it impossible to deal with the ever-increasing flow of business. The organisation of the new body was designed to obviate this difficulty. The scheme drafted by Mr. Hichens,[5] dividing the Board into five departments, each under its own head, with the Chairman of the Board as executive head of the whole, was afterwards adopted almost in

[1] HIST. REC./R./1142/4; R.I.M.B./Gen./414; 94/Gen./335.
[2] R.I.M.B./Gen./414. [3] *Ibid.* [4] *Ibid.*
[5] HIST. REC./R./1142/39, 41.

its entirety. The five departments were Purchasing and Contracts, Technical, Inspection, Secretariat and Financial, while departments for Labour, Aeronautical Supplies and Aviation were subsequently added as the need arose.

(*a*) Purchasing and Contracts Department.

Conditions had entirely changed since the early days of the Shell Committee when it had been difficult to induce manufacturers to undertake shell manufacture. Now, instead of a holding back, there was actual competition for orders, and it was essential to have a purchasing agent in touch with the new conditions. Mr. Edward Fitzgerald,[1] assistant purchasing agent for the Canadian Pacific Railway, who had already had experience as a buyer of stores for the War Office, became head of the Purchasing and Contracts Department of the Board, and dealt with the placing of orders and settling of contracts, besides keeping in touch, by means of a special staff of inspectors, with the progress of operations in different factories, a side of the work hitherto much neglected.

In 1918, it was proposed that one office should be formed in London, under Mr. Brand, which should represent both the Imperial Munitions Board and the British Mission in the United States for the purchase of all war materials except food supplies and the settlement of all questions arising therefrom.[2] In this way it was hoped to minimise delays due to distance and to secure more uniformity in large questions of policy, but before any definite steps were taken to carry the project into effect, the end of the war made it unnecessary.

(*b*) Technical and Inspection Departments.

All official correspondence was carried on through the General Secretariat, which dealt with letters of a general nature and distributed those requiring more specialised information to the various departments concerned. The Technical Department, under Colonel Carnegie, dealt with the many technical questions which arose from day to day. He worked in co-operation with Mr. Fitzgerald in settling the prices to be paid for different operations in shell making, and controlled the Gauge Department and the drawing offices.

Before November, 1915, inspection had been carried out by Colonel Greville Harston, Chief Inspector of Arms and Ammunition in the Militia Department,[3] but, with the appointment of the Imperial Munitions Board, the work was transferred to the new body, as it was important that the Inspection Department should be in touch with the rest of the organisation. The staff under Colonel Greville Harston consisted partly of inspectors attached to the Canadian Militia Department and partly of officers and examiners sent out by the War Office. All the latter, and most of the former, were transferred to the new department. Major Ogilvie, who had been in charge of the shell inspection, was appointed Chief Inspector. Administratively, Colonel Ogilvie was subject to the Board, but from the technical point of view he was responsible to the Inspection Department of the

[1] Hist. Rec./R./1142/4. [2] R.I.M.B./Gen./274. [3] Hist. Rec./H./900/17.

Ministry of Munitions, and required its express sanction before permitting any relaxation of the specifications and technical requirements of the War Office.[1] He was entitled to appeal from the Board to the Ministry on any matter " which entailed a difference of opinion in the interpretation of the terms of a specification."

At first, the headquarters of the Inspection Department were in Quebec, but in August, 1916, they were removed to Ottawa, which had the advantage of bringing Colonel Ogilvie into closer touch with the Technical Department under Colonel Carnegie. Serious troubles, however, arose in the summer of 1916, as the enormous increase in the output of munitions in Canada threw a greater strain upon the Inspection Department than it was able to meet, and it became evident that the inspection both of shells and fuses was inadequate. Complaints that defective shells had been passed by the Inspection Department were substantiated, and both the Imperial Munitions Board and the Ministry of Munitions viewed the situation with increasing alarm.[2] It was clear that the relations which existed between the Board and Colonel Ogilvie, on the one hand, and the Inspection Department of the Ministry of Munitions on the other, were not sufficiently close, and on 20 September, 1916, the Ministry appointed a departmental committee, consisting of Mr. (later Sir Edmund) Phipps (Chairman), Sir Sothern Holland, Mr. Perry, the Hon. R. H. Brand and Sir Ernest Moir to consider the question of inspection in the United States and Canada, with a view to improving its efficiency.[3] On the recommendation of the committee, Colonel W. E. Edwards, Assistant Deputy Director-General of the Department of Munition Inspection, was sent to Canada to make a thorough investigation into the organisation and system of inspection.[4]

At the same time, Mr. Flavelle, who was in England, discussed matters with Sir Sothern Holland, Director-General of Inspection in Great Britain, and arrangements were made to bring the Inspection Department in Canada under the direct administrative control of the Inspection Department at home, as had already been done in the United States.[5] It was hoped that the Director-General of Munitions Inspection would be able to help the Canadian Inspection Department by co-ordinating inspection, supplying staff, communicating technical information at regular intervals, and giving greater assistance in supplying gauges. It was also decided that Colonel Edwards, who had made many valuable suggestions in the course of his inquiry, should remain in Canada as Director of Inspection, while Colonel Ogilvie continued to hold the office of Chief Inspector. These arrangements came into force on 22 November, 1916.[6] Colonel Edwards was given a seat on the Imperial Munitions Board. His responsibility as a member of the Board was limited to matters affecting his own department and he was not considered answerable for the general

[1] M. 683. The letters B. (from the Board), M. (from the Ministry), B.C. (from the Board, cypher) and M.C. (from the Ministry, cypher), denote cables now filed in the Archives Registry and in R.I.M.B. registered jackets.
[2] 94/Gen./335. [3] *Ibid.*; M.C. 81; B. 956. [4] M. 771. See also below, p. 53.
[5] M.M. 557 in R.I.M.B./Gen./229. [6] B. 1478; M.C. 96; M. 1223.

administrative and financial action of the Board. He had direct access to the Director-General of Munitions Inspection through the section known as I.M.Y. 2, and corresponded with him direct on routine matters, such as details of staff, tolerances, etc., without reference to the Board.

(c) Finance and Labour Departments.

Mr. F. Perry, the financial member of the Board, was the head of the Finance Department, with Mr. George Edwards as his assistant. As the pressure of work increased, the department was divided into sub-sections for dealing with the Accounting, Statistical, Adjustment and Insurance branches of the work.

In September, 1916, a new department was established to deal with labour problems,[1] to assist contractors in diluting labour by the introduction of women workers and to help employers to obtain labour with the minimum of interference to existing industries. The department only acted in an advisory capacity, for the Board itself had no authority to control labour. Considerable progress was made with dilution. Although prior to September, 1916, no women had been employed in the manufacture of munitions in Canada, six months later no less than 11,000 women were doing this work satisfactorily. Great unwillingness was at first shown by contractors to adapt their premises to admit of the employment of women, but pressure by the Labour Department and the increasing shortage of men overcame these prejudices, and, in April, 1917, 111 plants were employing women in every operation subsequent to the forging of the metal.[2] Great attention was paid to the health and welfare of the women employed on munition work, and rest rooms, lunch rooms and first aid accommodation were provided in all the factories.

(d) Aviation and Aeronautical Supplies Departments.

The Aviation Department was formed on 26 January, 1917, to arrange for leases of sites suitable for the construction of aviation schools. Four sites were chosen at Camp Borden, Deseronto, North Toronto and Beamsville, Ontario, and buildings were erected for a five squadron unit, consisting of 90 machines in each case. As the long winter of Eastern Canada would have seriously interfered with the training of the Flying Corps, the Aviation Department made a reciprocal arrangement with the United States by which American cadets and mechanics were to come to Toronto for training in the summer months and members of the Canadian Flying Corps were to train in Texas and the Southern States during the winter.[3]

A department for Aeronautical Supplies was established in October, 1917, with administrative headquarters at Vancouver, Mr. Austin Taylor being the Director. The most pressing duty of the new department was to secure adequate supplies of spruce suitable for aeroplane construction. At first the department was subjected to criticism for its failure to secure immediate output, but, throughout, it

[1] (Printed) *Weekly Report*, No. 99, X.* (7.7.17).
[2] *Ibid.*
[3] *Ibid.* No. 110, X* (22.9.17).

pursued the policy of securing cutting rights and avoiding the direct purchase of large tracts of timber.

IV. Organisation of Canadian Resources for Munitions Supply.

The early days of the Imperial Munitions Board were beset with difficulties; it had to clear up the work of the Shell Committee and institute a more efficient organisation. As has been seen above, the Shell Committee had pursued the policy of distributing small orders amongst a large number of firms, and they had sometimes been influenced by other than strictly business considerations, as in the case of the orders for shell placed in British Columbia, which entailed 4,000 miles additional freightage. The prices paid by the Shell Committee were high, in view of the necessity of encouraging Canadian manufacturers to make shells, and had not been reduced as soon as they might have been, in the light of later experience and greater facility of output.[1] As has been seen above, contract by competitive tender was not introduced until November, 1915, the Shell Committee throughout having fixed contract prices on the basis of the least skilled firms, whose rate of output was necessarily slow; but within a few weeks, the Imperial Munitions Board had not only reduced the prices of new contracts but had cut down the prices already arranged by some $4,000,000 (£821,917). On one fuse contract alone, Mr. Gordon forced the contractors to revise their terms and secured a saving of some $1,800,000.[2]

The system upon which munitions were made in Canada threw a great deal of work upon the Board. As Mr. Flavelle said, "unlike the United States, where the large corporations who are given orders for munitions undertake to furnish a complete article . . . , we in this country, place orders with small establishments in every province in the Dominion"[3] and, as he wrote on another occasion, "We have no firms who take the complete contract. We must buy steel; we must forge it; we must arrange for the machining and assembling; we must buy the brass, and arrange to have it made into cartridge cases, and so through the whole list, whatever breakdown there is in the delivery of material, we have to assume the responsibility and try to correct it by finding material elsewhere. We are responsible for the keeping of these plants in operation by sending to them material upon which they expend the labour. Failure of steel manufacturers to give us what they have promised, a strike at any one of the steel-producing centres, the failure to send copper bands or to provide brass as required, all have to be cleared through this office."[4] The Board, in fact, served as a clearing house for all operations to the Ministry of Munitions, as well as for the various manufacturers. This adjustment of supplies was a delicate problem and there were inevitable mistakes and miscalculations at first. As Mr. Flavelle said, in July, 1916,[5] "I may frankly confess to some extent we have misjudged the quantity of material which we should have ahead. We have been working on

[1] See above, p. 17. [2] HIST. REC./H./1142/2, p. 3; HIST. REC./R./1142/4.
[3] HIST. REC./H./1142/2, p. 3. [4] HIST. REC./R./1142/4.
[5] HIST. REC./R./1142/4.

too narrow a margin and these disappointments in deliveries of the primary product have caused us considerable concern. We have not given ourselves sufficient freedom in the purchase of supplies in excess of orders, and we have not recognised sufficiently the length of time between the steel production at the steel plant and finished shells delivered from the various factories. The amount of product required to keep all the plants adequately supplied represents a tonnage greater than we have thought necessary."

By the beginning of 1917 there were more than 600 establishments working for the Board, and the immense distances over which supplies had to be transported—there were almost 4,500 miles between the first factory in the East and the last factory on the Pacific Coast—made the task of organisation arduous. "We purchase steel," said Mr. Flavelle, "and ship it 1,000, 1,500, 2,000 miles to have it forged. We ship it from the forging plants back again five or six hundred miles, or forward 2,000 miles to machining plants. We purchase the other component parts of the shells from manufacturers as far south as Florida and as far East as the United States or Canada carries you. We gather these parts and send them to remote points, and every manufacturer from ocean to ocean manufacturing and assembling shells is dependent upon what we may accomplish in delivering these forgings and components that they may keep up sustained deliveries of finished shells. We are in the peculiar position of being under obligation to deliver these products necessary for war and which we have undertaken to deliver at a stated time, and yet we have absolutely no authority over any one of the plants wherein the work is being done, with the exception of the fuse plant in Montreal. Failure on the part of the railways to move the components, failure on the part of the steel plants to produce the product, failure in any one of the various plants to produce the materials required for shipment to the remote point means disappointment, means delay, means sometimes at the Head Office seven or eight hundred telegrams, many of them so hot that you would think they would burn the wire while in transit."[1]

Within six months considerable progress had been made. Orders for munitions amounting to some $500,000,000 had been given and the Board were directly employing the services of four hundred firms in Canada.[2] In the summer of 1916 a more rigorous method of testing steel, which was instituted under pressure from the Ministry of Munitions, delayed the munition programme, but the output of the factories was steadily increasing. Moreover, Canada was now able for the first time to turn out complete rounds, as the Board had started a government factory for making No. 80 fuses in Montreal, and, although the manufacture of fuses was only begun in the middle of December, 1915, six months later fuses made and loaded in Canada had already passed the firing tests successfully. "Considering that not a single time fuse had ever before been made in Canada, this is, I think, a record," wrote Mr. Brand.[3] The production of fuses was not as yet sufficient to keep pace with the output of shells and half the consignments despatched to Great Britain were still sent over unfused.

[1] HIST. REC./H./1142/2. [2] 16 August, 1916 (HIST. REC./R./1142/4). [3] *Ibid.*

V. National Factories.

During the progress of the Board's operations some eight national undertakings were organised for the production of commodities for which private enterprise had failed to supply adequate facilities.[1] Excepting in the case of the Aeronautical Supplies Department, which was conducted as a department of the Board itself, these national undertakings took the form of Joint Stock Companies, with a uniform nominal capital of $50,000, the Board being the sole shareholder. A limited number of shares were transferred to responsible officers of the Board to enable them to act meanwhile as directors. The groups of men selected for the directorates of these companies were chosen with regard to their special knowledge of or qualifications for the work to be performed, and the entire management of each undertaking was left to the directorate. The usual procedure was to establish the authority for the expenditure of capital necessary to construct the plant and place it in operation. Each company was treated thereafter by the Board as an ordinary contractor and supplied with components or raw materials in the same manner as any other contractor. Each factory was given a contract for the whole of its output, the contract price being determined either by reference to the contract price allowed to private contractors for similar products, or, if there were no such comparison possible, then by reference to prices allowed by the Imperial Government in like cases elsewhere. The Board, of course, furnished all necessary working capital, in addition to the money advanced for the construction of the plant itself, and an ordinary debit and credit account was kept for the supplies of materials on the one side and the receipts of finished product on the other. The undertakings so carried on were uniformly successful. Two of them, the British Munitions Company, Limited, and the Canadian Aeroplanes Company, Limited, succeeded during the course of their operating period in realising profits, or in other words saving to the Imperial Government sums of money largely exceeding the original capital expenditure. One other company, the British Explosives, Limited, which operated a leased plant, also yielded a handsome profit over and above the rental paid for the use of the plant. Three others, the British Cordite Company, Limited, the British Chemical Company, Limited, and British Forgings, Limited, had already earned large profits and were in a fair way to earn sufficient to repay the capital expenditure, when the Armistice conditions rendered these operations no longer necessary; while the remaining undertakings, British Acetones, Limited, and the Aeronautical Supplies Department, were successful when measured by the standards of supplying urgent requirements of the Ministry which could be met in no other way, rather than in a purely financial sense. The final outcome of the operations of all the undertakings when considered as one undertaking, was a net saving to the Imperial Government when compared with the cost of their combined product at the average prices paid to private contractors. Ultimately, the plants remaining were disposed of at fair prices to private business

[1] HIST. REC./H./1142/8.

concerns, the result being to return a substantial portion of such capital expenditure to the Imperial Government in addition to the saving effected by their operations as above indicated.

VI. Reforms in Accounting Methods.

As munitions work in Canada developed, the system of accounting introduced by the Shell Committee was found to be inadequate. It consisted of book-keeping by double entry, except in cases of raw materials and products, where a series of separate accounts were kept, classified under the names of the various components or raw materials purchased. Thus there were accounts for forgings, for discs, for bullets, and, as time passed, these records showed the accumulated purchases of the Committee. Finished shells were debited to the Ministry at the agreed price, and credited to accounts opened under their respective headings. Thus the Committee's operating accounts showed on the debit side the cost severally of the components and materials purchased, and on the credit side the value, at the Ministry prices, of the munitions exported. From this method of accounting it was impossible to take inventories for the purpose of verifying the position thus shown, and owing to the great pressure of work it was evident that there would be no time to verify by inventory any statement from books kept in this way.[1]

The Imperial Munitions Board introduced a more satisfactory system of accounting, which was designed to make each munition manufacturer responsible for the materials entrusted to him. Records of the Shell Committee existed, purporting to show the shipments made to the various factories, and these formed the basis of the set of accounts known as " Accounts Receivable " of the Board. Each contractor had also a current account with the Board, showing the value of the work upon the completed munitions for which he was entitled to cash payment. These accounts were known as the " Accounts Payable " of the Board.

The task of readjusting the accounting system was a very difficult one, as not only was it imperative not to interfere with the current business which was increasing greatly in volume, but it was also necessary to deal with arrears. A special staff worked day and night to verify the records of the distribution of material made by the Shell Committee. A month after the Imperial Munitions Board was formed the new system of accounting was in working order, and, by the end of January, 1916, the Board could state with accuracy the amount of material supplied to each contractor which had not yet been returned in the form of finished product.

One distinctive feature in the " Accounts Receivable " was that the quantities of raw materials debited to a manufacturer were recorded at the same time and along with the value of those materials, so that the contractor was debited in the ledger with both quantities and value. The Board had no need, therefore, to refer to a separate or auxiliary ledger to know the supply of materials in the hands of a contractor

[1] HIST. REC./H./1142/8.

at any given time. The "Accounts Receivable" were cleared by sending the contractor's invoice to the Board for the finished product. This invoice set out the value of the contractor's work and also the value of the components incorporated in the finished product, so that the books of the Board showed a set of entries which credited to the contractor's "Accounts Receivable," the value of the components returned and credited to his "Accounts Payable," the value of his services in respect of such components, while the sum of the two showed the total cost to the Board of the finished product, which was debited to the "Production Account." As the cost of components varied from time to time, a section was formed for determining each month the average cost of the materials remaining in the hands of the contractors, and the accounts for the following month were cleared upon the average so obtained. The balances of the "Accounts Receivable" at the end of the month represented with almost absolute accuracy, not only the quantities of the components still in process of manufacture, but also the value of these materials for the purpose of determining the costs of future production.

Before this system was instituted, great laxness was shown by the contractors with regards to the materials entrusted to them and much avoidable waste was taking place. The Board created an organisation of travelling inspectors who paid periodical visits and made approximate inventories, calling the contractors to account for serious discrepancies between the quantities of materials shown by the Board's books and the amount actually in their hands. These steps led to a better system of accounting on the part of the contractors themselves and closer supervision to prevent wastage of material by their employees. By degrees the contractors took a more serious view of their responsibility for the materials entrusted to them, and in the final accounting, after the Armistice was signed, the surplus of the vast stores of materials and components which had been supplied to contractors during the past four years was either returned or paid for.

VII. The Placing of Contracts in Canada in Preference to the United States of America.

In the early stages of the war, Canada was handicapped in securing munition orders by the fact that her industrial development was only just beginning, whereas the United States had already well-equipped engineering establishments capable of producing munitions upon a large scale.[1]

As Canadian capacity developed, the placing of very large munition orders in the United States aroused considerable feeling. The Canadian view of the situation was summarised by Mr. Brand at the beginning of 1917, as follows :—

> "The Imperial Munitions Board have always advocated the view that it was very much in the interests of the British and all the Allied Governments that the manufacture of shells and components should, as far as possible, be carried out in Canada

[1] See above, Chap. I.

in preference to the United States. Experience has shown that when the manufacture of a particular class of shell is firmly established in Canada, prices have been as low, or lower, than those in the United States, a fact which is partly due, at any rate, to the willingness of Canadian manufacturers to take a lower rate of profit. Apart, however, from the question of price, there have been two other arguments for this opinion. The first is the evident advantage of becoming self-supporting. If for financial or other reasons the further export of munitions from neutral countries was suddenly cut off, there would be an interval of many months before the gap could be filled by starting fresh factories in Allied territory. On the other hand, if an output sufficient to the requirements of the Allied Armies were once established in Allied territory, it could not be suddenly cut off.

"The second reason is even more important, all munitions purchased in the United States have to be paid for in gold or in the proceeds of American securities. The amount of this at the Allies' disposal is limited, and has been heavily drawn upon already. When it is exhausted, purchases from the United States may be very difficult, since America may not lend money on the sole credit of the Allied Governments, except to a limited amount. But certain raw materials must be got from the United States in order to continue munitions manufacture at home. If the war is protracted, it is therefore essential to husband our limited means of payment so as to continue to buy from the United States the raw material necessary, without which we cannot make munitions at all. Every dollar spent in the United States for shells is a deduction from what may be called the purchasing fund available for the purchase of raw material throughout the period of the war.

"On the other hand, owing to advances made by the Canadian Government and the Canadian Banks, more than 50 per cent. of the munitions supplied from Canada up to the present have been supplied upon credit, which will be extended, at any rate, till the end of the war. But even the gold (or its equivalent), which has been paid for the balance, is not a drain on the financial resources of the Allies in the same way as a payment to the United States. The money goes from Great Britain to Canada, but it passes from one part of the Allied territory to the other, and is still available for the purposes of the war since the total resources of Canada, just as much as those of Great Britain, can be drawn on in the last resort. If the money goes to the United States, it passes out of Allied territory altogether and can no longer be drawn back in the shape of war taxes or War Loans. It is, in fact, a final loss to the Allied 'purchasing fund'—a deduction from the limited amount of capital which they have available for necessary purchases from neutrals. In the other case, it is merely transferred from one Ally to the other, and the total financial resources of the Allies are only diminished by the amount paid for raw

materials which have to be imported from neutral countries wherever the shells are made. This is only a small part of the total cost of the shells."[1]

The policy thus outlined had been advocated by Mr. D. A. Thomas towards the end of 1915, but its realisation was slow. "There is a very sullen feeling among many manufacturers here," wrote Colonel Carnegie to Mr. Lloyd George in March, 1916, "because work is being done in the United States which could be done here. I have been preaching that the Ministry are most anxious to obtain all shells possible from Canada, but it is the hardest thing in the world to make them believe this, when their plants are idle and factories in the United States are so busy."[2]

Keen resentment was aroused in June, 1916, when it was found that a Russian railway order, financed by Great Britain, was to be carried out in the United States.[3] This feeling was further increased in October, when a department of the Ministry of Munitions proposed to spend some $40,000,000 in buying machinery in the United States to equip factories in Great Britain to make shells of types which were already being produced in Canada at a rather lower price than that at which they had ever been turned out at home,[4] but the placing of large orders for shell in Canada by the Ministry of Munitions in November, 1916, for delivery in the first six months of 1917, helped to remove the unfortunate impression.

With the entry of the United States into the war in the spring of 1917 the position changed. Canada had more munition orders than she could undertake, and the question was no longer whether British orders should be placed in the Dominion in preference to the United States, but whether Canada should supply any part of the British munition programme or devote her whole resources to the needs of the United States.

---

[1] HIST. REC./H./1142/2.
[2] *Ibid.*/R./1142/36.
[3] *Ibid* /R./1142/13.
[4] *Ibid.*

CHAPTER IV.

DEVELOPMENT OF THE PRODUCTION OF GUN AMMUNITION.

I. Introductory.

The most striking feature of Canada's contribution to the supply of munitions during the war is, of course, the production of shells and forgings. Though before the outbreak of war no private manufacturer had ever made a shell in Canada,[1] and except for a small output from the Dominion Arsenal in Quebec, Canada had no experience whatever in the production of gun ammunition, by the end of 1918 she had contributed more than 65,000,000 shells—one quarter of the total output from all sources—nearly 30,000,000 fuses, 47,000,000 cartridge cases, 15,000,000 primers, and over 6,000,000 shell forgings.[2] Measured in terms of money, this contribution was valued at over $900,000,000, out of a total expenditure on Canadian munitions of about $1,000,000,000. It is worth while, therefore, to follow in outline the growth of the demand for and supply of ammunition, which represented 90 per cent. of Canada's contribution.

As has been seen, Canadian manufacturers were first asked to undertake the production of 18-pdr. shrapnel and H.E., and their efforts met with considerable success, as the plant used in many industries proved readily adaptable for the purpose. The Shell Committee next undertook the manufacture of complete shells, but this attempt proved less successful, and at one time fuses seemed likely to prove an insuperable difficulty. Details of the orders placed by the Shell Committee have been given in an earlier chapter,[3] when it was shown that although the manufacturers were anxious to attempt large shells, with the exception of one comparatively small quantity of 60-pdr. H.E., orders for 18-pdr. and 4·5-in. shells only were placed, and it was not until November and December, 1915, that contracts for 22,000 6-in. H.E. and 6,000 8-in. H.E. were given.

II. Shell Production in 1916.

After the dissolution of the Shell Committee, existing contracts were carried on by the Imperial Munitions Board, and at the same time strenuous efforts were made to secure fresh munition orders for Canada in preference to the United States. This was not an easy matter, as the Treasury was already alarmed over the state of the American Exchange, and transferring orders from the United States would tend to reduce the amount of credit to be obtained there.[4]

---

[1] Hist. Rec./H./1142/2 ; see also Chap. I.
[2] For exact figures, see Appendix II.
[3] See above, Chap. II.
[4] Hist. Rec./R./1142/36 ; see also Chap. VI.

Moreover, Canada had a bad reputation for non-delivery to time and non-fulfilment of contracts in the matter of munitions, and it was clear that before fresh orders to any considerable extent could be hoped for these defects must be remedied. The Board took immediate steps to deal with the situation by inserting a clause in all new contracts, giving them the option to cancel delayed deliveries,[1] and Mr. Flavelle stated, in April, 1916, that "no contract is now given which does not contain the manufacturers' statement of deliveries each month." They also adopted the policy of placing orders with contractors somewhat in excess of the amount actually authorised by the Ministry of Munitions, so that the full quantities ordered could still be supplied, even when defaults occurred.[2] As the munition orders allotted to Canada were very closely dependent upon the amount of credit she raised, Mr. Flavelle exerted his influence to persuade the banks to come forward generously with loans, until, in March, 1917, the expenditure on munitions in Canada, amounting to about $700,000,000 (£143,835,616), was nearly one-third of the corresponding expenditure at home,[3] in spite of the fact that the population was one-sixth of that in the United Kingdom.

In the spring of 1916 the allocation of shell orders to Canada as part of the gun ammunition programme for the remainder of 1916 was being considered. The Ministry was reluctant to place further orders while existing orders were still not completed, as was notoriously the case with the 6-in. shell, of which 1,250,000 still remained to be delivered,[4] and when the programme was drafted in April, 1916, the Ministry insisted that orders should only be given in Canada on condition that new, as well as existing contracts should be completed by the end of the year. Under this programme orders were placed in Canada for 260,000 18-pdr. shrapnel per week during November and December; 440,000 60-pdr. H.E. per week; 750,000 6-in. per week; 160,000 4·5-in. per week in November and December, and a total of 78,000 8-in. for the British Government, in addition to 145,000 8-in. ordered for Russia and 12,000 9·2-in., delivery of which was to be completed by December.[5]

By the middle of 1916 Canada was for the first time producing munitions upon a large scale. In July, 1916, the average factory output of 18-pdr. shrapnel shell, fixed, loaded and fused as far as the rate of fuse production allowed, was 235,000 per week, and the Board were prepared to increase the output to 300,000 a week in January, if desired.[6] On 22 September, 1916, owing to the existence of large stocks and the fact that an acceleration of production in Great Britain was expected, the Board were asked to reduce their output, and an order for 150,000 per week for delivery between 1 March and 31 May, 1917, was given to keep the existing factories at work.[7] A week later these instructions were cancelled and Canada was asked to supply 260,000 18-pdr. shrapnel per week during the second quarter of 1917.[8]

[1] HIST. REC./R./1142/36.
[2] Despatch 615 (R.I.M.B./Gen./224.)
[3] HIST. REC./H./1142/2, p. 1.
[4] Despatch 39 (D.D.G. (B.) 58.)
[5] M. 190, 192, 195, 199.
[6] HIST. REC./R./1142/14.
[7] M. 787.
[8] M. 826.

As in the United Kingdom, difficulties were caused by the over-production of light shell. As heavy orders for 18-pdr. H.E. had been placed in the United States, the Ministry decided that no further shell of this nature would be required from Canada, and the Board were instructed to close down factories as orders were completed.[1] In the first three months of 1916 the output of 18-pdr. H.E. had been 200,000 a week, but by October, 1916 it had fallen to 40,000 a week, and was expected soon to cease entirely.[2] Some of the plants had been adapted to turn out 18-pdr. shrapnel and 4·5-in. shell, and the remainder had to be closed down.

In the case of 4·5-in. howitzer shell, the output in July, 1916, was at the rate of 100,000 per week and could easily have been increased to 140,000 per week by the end of the year, but the Board were informed several times during the summer that there was no longer any urgent need for this class of shell and that it was not advisable to speed up the output.[3] They were, however, instructed to order 140,000 per week for delivery during the second quarter of 1917. At the same time they were asked whether, if machining capacity could be increased in the United Kingdom, they could gradually change over from shipping shells to shipping forgings only.[4] In reply the Board offered to supply 140,000 shells per week and forgings in addition, urging that it would be wiser to continue existing plants in Canada, rather than to close them down and equip new ones in the United Kingdom.[5]

The output of 60-pdr. H.E. shell reached 20,000 per week in July, 1916, and could have been increased to 35,000 per week by the end of the year, but instructions were received from the Ministry of Munitions in September to reduce the output to 15,000 per week as a larger supply was not needed, and when existing orders expired no further orders were to be given.[6] In October, the output of this shell was diminishing and the Board hoped to convert some of the 60-pdr. plant to the manufacture of 6-in. shell.[7]

While the output of light shell was being cut off, the manufacture of larger shell, to which the Ministry wished Canada to devote her attention, was gradually developed. In September the factory output for 6-in. shell was 24,000 per week, for 8-in. 5,400 per week, and for 9·2-in. 5,000 per week.[8] The Ministry wished Canada to concentrate as far as possible on 9·2-in. shell, as the capacity of the plants in the United States for 8-in. shell was larger in proportion to requirements than that of the 9·2-in. plant, and the Board were asked to negotiate orders for 9·2-in. to the total of 20,000 per week.[9]

Canadian manufacturers also offered to undertake the production of 12-in. shell, and in June, 1916, a conference met to discuss the question. As the first 50,000 12-in. shell would not be delivered in Canada before the end of July, 1917, and would cost a million dollars and upwards more than if ordered in the United States, the conference decided not to enter into any contracts involving the erection of new plant.

---

[1] HIST. REC./R./1142/14.
[2] *Ibid.*
[3] *Ibid.*
[4] M. 786.
[5] B. 1166.
[6] M. 704.
[7] HIST. REC./R./1142/14.
[8] *Ibid.*
[9] M. 516.

On 19 June, 1916, the Ministry directed that in future no shells from 4·5-in. upwards should be filled in Canada as there was now ample filling capacity in England.[1]

In addition to shells, Canada produced 310,000 brass cartridge cases per week during September, 1916, and had continuation orders for 350,000 per week during the first quarter of 1917. The Board noted that the capacity of the plants making cartridge cases was considerably in excess of this output, but the limiting factor was the supply of discs.[2]

III. Heavy Shell Programme for January–July 1917.

Under the revised programme of October, 1916, the shell requirements from Canada for the first six months of 1917 were greatly in excess of all previous demands. The new programme[3] included 300,000 complete 18-pdr. shrapnel per week, to increase if possible to 350,000; 160,000 4·5-in. per week; 15,000 60-pdr. per week; 100,000 6-in. per week; 20,000 8-in. per week and 20,000 9·2-in. per week. An additional order for 50,000 empty 18-pdr. H.E. shell was placed a few days later.[4]

Some idea of the magnitude of this programme may be obtained from the fact that under it Canada was to provide half the 18-pdr. shrapnel used by the British armies in France. The Board were also asked if they could increase their output of 18-pdr. H.E. to 100,000 per week if required, but in view of the big programme already undertaken, they did not feel it advisable to undertake more than the 50,000 per week already arranged.[5]

In March, 1917, the Ministry of Munitions modified their original requirements by reducing the quantities of heavier shell and increasing the orders for 18-pdr. and 4·5-in., this modification being on the lines of that adopted at home.[6] Under the new programme,[7] Canada was to supply 300,000 to 350,000 complete rounds of 18-pdr. shrapnel and an average of 25,000 18-pdr. H.E. per week, from March to November, 1917, while the Ministry was prepared to take 50,000 18-pdr. H.E. per week, if the manufacturers could reach that quantity. 125,000 to 140,000 4·5-in. shell were required per week, but no more 60-pdr. H.E. would be needed after existing contracts were completed as all the shells needed could be manufactured in the United Kingdom, and the plant was to be adapted for 4·5-in. shell. Canada was to send an average of 60,000 6-in. per week and a total of 360,000 each of 8-in. and 9·2-in. respectively, from March to the end of June, but, after that date, no further deliveries of either would be needed from Canada as all foreseen requirements could be more than met from output in the United Kingdom, while financial difficulties and the necessity of economising tonnage compelled the Government to discontinue supplies of heavier shell from Canada as had previously been done from the United States.[8]

---

[1] M. 443.
[2] HIST. REC./R./1142/14.
[3] M. 1014.
[4] M. 1044; M. 1092.
[5] M. 1077; B. 1522.
[6] See Vol. X, Part II.
[7] M.C. 137 (R.I.M.B./Gen./259).
[8] M.C. 137.

One difficulty experienced by the Imperial Munitions Board in regulating the output of munitions was the fact that short contracts only were placed. To quote Mr. Flavelle: "The output upon existing orders is adversely affected by our inability to give assurance of continuation of orders. We have to put off manufacturers who now offer to co-operate in production by the statement that we can give no forecast."[1] The Ministry of Munitions, however, was unwilling that orders should be placed further in advance than was necessary to keep production going, as they believed that long contracts tended to stereotype the costs of production and to hinder any fall in prices.

IV. Reduction of the Ammunition Programme.

In July, 1917, the financial position in Canada caused grave anxiety,[2] and it was clear that unless funds were at once forthcoming to meet the payments due, there would be a serious crisis. In order to relieve the situation, the Treasury directed the Imperial Munitions Board to spread their commitments over a considerable period, so that payment could be deferred as long as possible. A serious deficit for the period up to 30 September, 1917, was still uncovered and the Treasury decided, in May, 1917, that the munition programme for the remainder of the year must be drastically curtailed, while the placing of fresh orders involving a weekly expenditure of some $7,056,000 was altogether out of the question.[3] To meet the situation, the programme was rigorously curtailed, the single exception being 6-in. shell, whose value was becoming increasingly clear to the armies in France, and the Board were authorised to increase the output of this type to 145,000 per week by the end of the year.[4]

The Board were asked to cancel all outstanding contracts for 8-in., 9·2-in., 60-pdr., 18-pdr. H.E., graze fuses, friction tubes and gaines, as far as possible, by consent or without disproportionate financial liability. In the case of the irreducible remainder, deliveries were to be extended over as long a period as possible. In addition, the supply of complete rounds of 18-pdr. shrapnel was to be reduced from 350,000 to 175,000 per week; the output of 4·5-in. H.E. was cut down to 75,000 per week, of exploder containers to 250,000 per week, of 4·5-in. cartridge cases to 85,000 per week, and of 18-pdr. cartridge cases to 100,000 per week. It was made clear, that even these requirements depended upon the extent to which the financial position would allow orders to be placed.

V. Shipping Difficulties.

During the closing months of 1917 and the beginning of 1918, the necessity for economising tonnage and avoiding unnecessary shipments became imperative, and, as the factories in Great Britain had developed additional capacity, the demands upon Canada for shell were greatly reduced.

---

[1] HIST. REC./R./1142/36.

[2] For a detailed account of this, see below, Chap. VI.

[3] M. 2302; A.C. 132.

[4] More than half the 6-in. howitzer shell used by the British Army in 1918 came from Canada.

The Ministry decided that no more complete rounds of shrapnel, and no more fuses should be shipped from Canada, and in the programme drafted by the Programme Committee in April, 1918, only a weekly output of 160,000 6-in. shell and 120,000 18-pdr. empty shrapnel was required. No more 4·5-in. shell and no exploder containers were to be manufactured in future.[1] The decision to stop the output of 4·5-in. shell, exploder containers and fuses involved the Board in grave difficulties with the manufacturers, and as they had on their hands sufficient 4.5-in. forgings, steel and copper bands to keep the 4.5-in. machining plants operating at the rate of 60,000 per week for six weeks after the end of June, they obtained permission from the Ministry to continue a limited output of some 15,000 shells per week until the material was used up.[2] Later, on 23 May, 1918, the demand was raised to 230,000 empty 18-pdr. shrapnel per week, and the Board arranged to enlarge existing plants and turn over some 4·5-in. plants.[3]

VI. Supply of Fuses.

With regard to fuses, two contracts placed by the Shell Committee in the United States were still in force in October, 1916, and, including their output, the production of time fuses exceeded 30,000 a day. The Board believed that by January, 1917, their own plant would be reaching 25,000 a day and the rate of output, when the American contracts expired, would therefore be undiminished.[4] In July, 1916, the Board had been told that there was no need to increase their capacity as the great development of fuse production in England meant that the Ministry would only require an output of 30,000 a day from Canada in 1917,[5] but in October they were asked if they could increase their capacity for time fuses up to 60,000 a day by May, 1917.[6] The Board undertook to ship approximately four million time fuses by 31 December, 1916, but owing to serious difficulties experienced by two of the manufacturers, the actual shipments were 900,000 less than estimated.[7]

In 1917, however, production developed rapidly, and by April Canada could fuse all the shells made in the Dominion without depending on the United States for either parts or loading. The plant at Verdun had a loading capacity of some 45,000 time fuses per day, and Canada's output could, if desired, be increased to the rate of 70,000 per day by an additional contract with the International Small Arms and Fuse Company.[8] In November, 1917, an order for 2,995,242 time fuses (No. 80) was given, which were all delivered before 30 November, 1918, and during 1918 no further contracts were made.

The manufacture of graze fuses was attempted by the Shell Committee, but only on an insignificant scale. A small contract was given to one company which was instructed to make steel fuses instead of brass, but the results were unsatisfactory, as the use of steel led to a high proportion of rejections on account of misfits in the component

---

[1] M. 4206.
[2] M. 4589.
[3] M. 4453; B. 6480.
[4] HIST. REC./R./1142/14.
[5] M. 588.
[6] M. 901.
[7] Despatch 615 (R.I.M.B./Gen./224).
[8] Despatch 482 (R.I.M.B./Gen./216).

parts.[1] In the summer of 1916, orders were placed with the Detroit Lubricator Company and the Russell Motor Car Company for 1,726,000 graze fuses, partly of steel and partly of brass. The Board estimated that in January, 1917, Canada would be producing 21,000 graze fuses per day and if the offer of the American Steam Gauge Company to establish a plant in Canada were accepted, the output would reach 46,000 per day by March 1917.[2] In September, 1916, further orders for 2,862,860 graze fuses, for delivery within twelve months, were placed, but the Ministry informed the Board that no further output would be required from Canada beyond the 24,000 per day thus arranged for. In May, 1917, orders for 1,200,000 graze fuses were placed with the Lymburner Company, Limited, the Packard Fuse Company, and the P. W. Ellis Company, but of the original order for 600,000 fuses placed with the Lymburner Company, Limited, all except 30,630 were subsequently cancelled. These were the last orders for graze fuses placed in Canada.

VII. Orders for Russia.

As the productive capacity of Canadian munition plants was more than sufficient to meet the requirements of the British Government, in the spring of 1916 the Board attempted to get some Russian contracts placed in Canada instead of in the United States. Their efforts met with little success at first; on the one hand, Canadian manufacturers were unwilling to make quotations, as they thought the Russian system of inspection unnecessarily severe, and on the other, Canadian production was inevitably associated in the mind of the Russian Government with a large contract for shells which had been carried out in the most unsatisfactory manner. At length, however, on 7 April, 1916, an order was given, on behalf of the Russian Government, for 145,000 8-in. shell of British pattern, inspected and paid for by Great Britain; delivery was to begin in November, 1916.[3]

VIII. Supply of Shell to the United States of America.

When the Ministry of Munitions reduced the shell programme, it authorised the Board to dispose of any surplus munitions to the United States Ordnance Department. The entry of the United States into the war had brought a new factor into the Canadian situation; from a keen competitor for munition orders, the United States became a purchaser on a large scale. Canadian manufacturers were naturally eager to secure large orders for shells, and financially Canada benefited by the change as she received payment in cash from the United States, instead of lending credit to Great Britain. In April, 1918, the Board diverted the plants which had been turning out 8-in. and 9·2-in. shells, to making 75-mm. shells for the United States and placed orders for 1,000,000 155-mm. shell; 200,000 9·2-in. shell and 50,000 12-in. shell for delivery by April, 1919, besides contracts for forging 1,600,000 75-mm. and machining and assembling 340,000 4·7-in.[4]

---

[1] HIST. REC./R./1142/14.
[2] *Ibid.*
[3] Despatch 101 (R.I.M.B./Gen./210); M. 199.
[4] B. 6183.

The question whether Canada should devote her entire capacity to producing munitions for the United States, the Ministry arranging for the carrying out of its shell programme without depending upon Canada, was an important one. Such an arrangement would benefit Canada financially, but, on the other hand, the conversion of large plants to make the type of shell required by the United States, would involve much delay and none of the shells ordered by the United States in Canada could be used at the front before the end of 1919. The adoption of a definite programme for the remainder of 1918, was delayed by the discussion of this question, and by the necessity of submitting munition programmes to the Inter-Allied Munitions Council. The question was further complicated by the offer of England and France to supply guns to the United States, which if accepted, would mean that Canada would be called upon to supply large quantities of 18-pdr. shrapnel and 6-in. shell for American use.[1] During this period of indecision, the Board found it difficult to restrain the impatience of the manufacturers who felt that golden opportunities for obtaining contracts on favourable terms in the United States were being allowed to slip. Considerable annoyance was already felt at the policy of the Ministry in regard to 18-pdr. shrapnel, the demand for which had been increased to 230,000 per week, in response to urgent representations made in May 1918.[2] Five months later, however, after strenuous efforts on the part of the Board to secure this increase, the Ministry decided to cut down the production of 18-pdr. shrapnel either to a nominal 60,000 per week or to nil.

During the summer of 1918, the Board accepted additional orders from the United States Ordnance Department, which brought the total output of 75-mm. shells to 300,000 per week, and made arrangements for the conversion of 18-pdr. plant to produce another 100,000 of these shells per week if necessary. Orders were also given involving large increases in the output of 155-mm. and 6-in. shell, bringing the total requirements to 110,000 and 90,000 per week respectively.[3] The magnitude of this programme alarmed the Ministry of Munitions, which pointed out that the capacity available for the British Government was reduced to 165,000 18-pdr. shrapnel and 75,000 6-in. shell per week, reminding the Board that the British offer of guns to the United States was entirely dependent for its utility on the possibility of obtaining shells of British type from Canada.

The gun ammunition programme formulated by the Ministry on 27 September, 1918, provided for the production in Canada of 154,000 6-in. shell per week, of which 60,000 were for the United States and 94,000 for Great Britain; 15,000 4·5-in. shell per week; 130,000 18-pdr. H.E. per week for the United States and 140,000 18-pdr. shrapnel rounds per week, of which 80,000 were for the United States and 60,000 for the Ministry.[4] Deliveries of completed shells for the United States were to be made between 1 January, 1919, and 1 January, 1920.

In October this programme was modified by increasing the requirements of 18-pdr. H.E. shell to 100,000 per week and reducing

[1] M.C. 298.
[2] M. 4350; B. 6310.
[3] B. 7900, 7906.
[4] M. 5382.

the shrapnel rounds to nil, while the Ministry wished the Board to change over a considerable amount of their plant to the manufacture of stream-line 6-in. shell, and proposed that the plant previously used for shrapnel should be adapted to make burster containers required for the new 6-in. shell.[1]

The Board protested that these changes threw the onus of producing new types of shell on Canada, while the bulk of the home factories retained the old types. The manufacture of stream-line 6-in. shell and the new type of 18-pdr. H.E. would need more supervision than the Board had time to give, and it was unreasonable to leave them with no part of their production running on the old types which required comparatively little attention.[2] The difficulty was aggravated by the fact that the United States Ordnance Department had just changed the type of nearly all the shells which were being manufactured for them in Canada. The Board maintained that if burster containers could be made in shrapnel plants, the Ministry should have some portion of them made in Great Britain and leave part of their shrapnel requirements to be supplied by Canada. The Ministry was prepared to meet these arguments, and, on 16 October, 1918, cabled to the Board to postpone the conversion of shrapnel plants for the production of stream-line shell for at least a month,[3] and provisionally ordered 90,000 6-in. shell of the old type and 100,000 rounds of 18-pdr. shrapnel per week, to be substituted for their previous order. But the Treasury refused to sanction this programme (28 October). They considered the order for 100,000 18-pdr. shrapnel shells per week to be unnecessary, as the total requirements were already adequately provided for by home production,[4] and they requested the Ministry to reconsider their whole programme in the light of the changed situation in France. The question was still unsettled when the Armistice was signed on 11 November. The Board lost no time in asking manufacturers to begin the reversion from war to peace time industries at the earliest possible moment, and to take steps to reduce their output substantially.

---

[1] M. 5510.
[2] B. 8442.
[3] M. 5558.
[4] M. 5654; R.I.M.B./Gen./218.

CHAPTER V.

THE SUPPLY OF MUNITION MATERIALS.[1]

In addition to the production of gun ammunition on the scale outlined in the preceding chapter, Canada's contribution included large quantities of shell steel, railway material, cordite, nitrocellulose, acetone, T.N.T., as well as considerable supplies of aero-engines, and of certain metals. In addition, 118,486 rifles were manufactured under a contract with the Ross Rifle Company, which was cancelled in 1917 owing to late deliveries and various other difficulties.[2]

I. Steel.

During the war there was a remarkable development of the Canadian steel industry, as, in addition to the steel required for the manufacture of 65,000,000 shells and 6,000,000 shell forgings, Canada supplied considerable quantities of shell steel bars. The first orders for shell steel were placed early in 1916 with the Steel Company of Canada, the Nova Scotia Steel Company, and the Dominion Iron and Steel Company—66,000 tons being ordered towards meeting a Ministry of Munitions request for 150,000 tons for delivery by December, 1916.[3] There was great delay in carrying out these orders. The Nova Scotia Company failed to ship as promised, and the Steel Company of Canada were held up by strikes at their works in Hamilton. In October, 1916, no shell steel had been shipped, and it was evident that no deliveries could be hoped for within the year. In view of the increasing demands for steel, however, the Ministry decided not to cancel the contracts but to take all the surplus steel which the companies could provide in the first six months of 1917.

In April, 1916, the Board, anticipating a steel shortage in the following year, wished to place an order with the Algoma Steel Company for 100,000 tons of shell steel to be delivered between 1 January and 31 July, 1917.[4] The Ministry were unwilling that orders for 1917 should be placed so far ahead at 1916 prices, fearing heavy losses if the steel were left on their hands at the end of the war. They recommended the Board to confer with the Canadian Government and take measures to control the supply of steel in Canada, prohibiting export if necessary and fixing prices by government action.[5]

In addition to the four leading Canadian steel companies—the Dominion Iron and Steel Company, the Algoma Steel Company, the Nova Scotia Steel Company, and the Steel Company of Canada—the Board established a national factory at Toronto, known as British Forgings, Limited. In the summer of 1916 grave anxiety was caused by premature explosions of 4·5-in. shell at proof and at the Front,

---

[1] For figures of output, see Appendix II.
[2] An account of this contract is given in Vol. XI, Part IV.
[3] M. 102; B. 104. [4] B. 379; B. 409. [5] M. 311.

and after exhaustive enquiries, it appeared that some of these might be due to defective steel supplied by Canada. The system of testing was found to be at fault, the yield point for the steel having been wrongly determined, and instead of a half per cent. extension, one per cent. had been allowed, which caused a large quantity of shell to be delivered under the 19 tons yield. After trials, it was found that a yield of 17 tons was the minimum which could be safely allowed ; all the shell affected had to be re-inspected and Brinell-tested, shell below a Brinell number corresponding to a 17½ tons yield being summarily rejected.[1] The adoption of these more stringent tests caused serious dislocation in the munition programme for the remainder of the year, especially in the output of 4·5-in. shell, and many plants working at full pressure were brought to a standstill until steel could be supplied which passed the new tests. This led to much discontent amongst the manufacturers of munitions in Canada, who were anxious to keep their men fully employed, fearing lest, if they dispensed with them for a time, they could never be replaced.

In the autumn of 1916 demands for steel became more pressing owing to the Admiralty requirement for steel for shipbuilding and the increased gun ammunition programme, and in October the Board decided to take the full output of the Canadian steel companies for the duration of the war. The Ministry urged the Board to increase the output of shell steel in Canada by 20,000 tons per month,[2] and sanctioned the extension of existing steel works and the erection of new furnaces, giving the Board general authority to contract for all the steel produced in Canada in the latter half of 1917, without submitting the orders in detail for their approval. As the result of this appeal, by making advances to steel producers for the construction of new furnaces, the Board secured an additional output of 15,000 tons a month for the latter half of 1917.[3] In June, 1917, the Canadian shell programme absorbed 20,000 tons of steel per week, all of which was forged in Canada at the various steel plants.[4] In addition, some 1,750 tons of bars and billets for 9·2-in., 8-in. and 4·5-in. shells per week were produced for export.

In the closing months of 1917 and in the beginning of 1918 it became increasingly difficult to maintain the output of steel owing to the shortage of raw materials. The deficiency of pig iron, coke and fuel oil caused the Board great anxiety, and as it was impossible to obtain adequate supplies of low phosphorus pig iron from the United States, proposals were made to import large quantities from Sweden.[5] The steel deliveries from November to February fell short by more than 22,000 tons per month of the amount estimated, and the Board feared that by May, 1918, there would be such a shortage of steel that the shell programme would suffer. In these circumstances, as the cost of importing low phosphorus pig iron from Sweden was found to be prohibitive, the Ministry advised the Board to convert the acid furnaces into basic, in order to use inferior hematite.[6] The Board found,

[1] HIST. REC./H./900/17. [2] M. 932. [3] B. 1409, 1482.
[4] (Printed) *Weekly Report*, No. 94, Supplement C (2.6.17).
[5] *Ibid.*, No. 135, XIV (30.3.18); B. 5702. [6] M. 4005.

however, after exhaustive inquiries, that the supply of pig iron for use in basic furnaces was just as short as that of low phosphorus pig iron and did not feel justified, therefore, in making the changes suggested by the Ministry.[1] The increased use of shell steel scrap, however, did much to improve the situation, and in the summer of 1918 the total production only fell short of requirements by a comparatively small amount. In July, 1918, the Board purchased 150,000 tons of shell steel from the Algoma Steel Corporation for delivery between 1 January and 30 June, 1919, at $3·75 per 100 lb. This transaction was sanctioned by the Treasury on condition that if the steel were not required for munitions, the company should be bound to roll it into a saleable commercial form.[2]

When the end of the war was in sight the Board took steps to consider how the steel plants could best be transformed for commercial purposes and they requested their Representative in London to make a careful study of similar installations in England, so that not only could a market be provided for the scrap steel but the plants also could be sold as going concerns.[3]

II. Explosives and Acetone.

(*a*) TRINITROTOLUOL.

Canada's contribution in the form of explosives and explosive materials was next in importance to her supply of ammunition. Of a total expenditure in this category of $67,235,100, nearly one half — $31,681,540 — represented the value of the T.N.T. (trinitrotoluol) supplied by the Dominion. Arrangements were made for the production of T.N.T. in Canada on a large scale in the spring of 1915, and contracts were signed with the Dominion Iron and Steel Company and the Toronto Chemical Company, Limited, by which the Government agreed to take all the toluol that the firms could nitrate at 80 cents per lb.[4] The Canadian Explosives Company installed a T.N.T. plant at Shand, in British Columbia, the Government taking their whole output at the rate of $1 per lb. When this contract expired in December, 1916, the Board limited the quantity to be paid for each month at the old rate, and stipulated in the new contract that the price for any amount above this figure was to be 55 cents per lb. The Board were also able to renew the contracts with the Dominion Iron and Steel Company and the Toronto Chemical Company, in the summer of 1916, on more advantageous terms, at a price of 50 cents per lb.[5] The T.N.T. supplied by these three firms under these agreements was to the American crude specification and needed treatment in England to bring it up to the highest grade of British T.N.T.

In addition, the English firm of Messrs. Curtis's and Harvey established a factory at Rigaud, where they produced T.N.T. of an exceptionally high standard, the whole of their output being delivered as pure T.N.T. In September, 1916, the Board made a contract with

[1] Despatch 1546 (R.I.M.B./Gen./227). [2] M. 4848.
[3] B. 7785. [4] B. 1009. [5] B. 1148.

this firm for 2,000 English tons of T.N.T. at the rate of 65 cents per lb. for delivery between January and May, 1917.[1] A national factory was also established which started work in May, 1917, with an output of 300,000 lb. of T.N.T. per month,[2] which was gradually increased as the plant worked more smoothly until six months later the production was tenfold.[3] Both Grade 2 and Grade 3 T.N.T. were produced at Trenton. During the summer and autumn of 1917, owing to transport difficulties, the bulk of this was sent to the Italian Military Mission in the United States, or stored in Canada until tonnage was available. In 1918, only Grade 2 T.N.T. was produced at the national factory and the output averaged 1,200,000 lbs. per month. During the war, Canada supplied 41,754,950 lb. of T.N.T. at an average cost of 75 cents per lb.

(*b*) Nitrocellulose Powder.

Canada also supplied nitrocellulose powder on a large scale. Including the cordite shipped with 18-pdr. shrapnel and H.E. complete rounds, the Dominion supplied 43,685,271 lb. during the war.

In October, 1915, the Shell Committee placed an order with O'Brien's Munitions Limited, for nitrocellulose powder to load 2,500,000 shrapnel shell. As an inducement to erect new plant the Committee advanced $500,000, to be repaid out of the proceeds of the contract. The plant was found, when in working order, to produce nitrocellulose powder in excess of the requirements for filling shells, but the company were unable to compete with the United States price of 60 cents per lb.[4] In November, 1916, the company leased their works at Renfrew to the British Chemical Company, who operated it under the Imperial Munitions Board on the lines of a national factory. The nitrocotton for these works had originally been obtained in the United States, but the Board made arrangements with the Davis Durkin Corporation to erect a nitrocotton plant at Trenton, Ontario, to serve the Renfrew factory. This scheme was sanctioned in November, 1916, and it was further decided to enlarge the nitrocotton plant and erect a nitrocellulose powder plant at Trenton, so that Canadian production could be greatly developed. The Trenton factories were operated by the British Chemical Company, Ltd., at a fixed commission on the output. Deliveries from Renfrew began early in 1917 and from Trenton in the following August.[5] Another source of supply was the Aetna Chemical Company, which agreed to supply the Board with 1,500,000 lb. of nitrocellulose powder per month at 50 cents per lb. for delivery between January and June, 1917.[6] Only half this amount was delivered and the Board cancelled the remainder[7] as their Renfrew factory was producing 1,000,000 lb. of powder a month.

Transport difficulties compelled the British Government to economise tonnage in the early months of 1918, and large quantities of nitrocellulose powder were stored in Canada at L'Assomption and

---

[1] B. 1082. [2] (Printed) *Weekly Report*, No. 101, X* (21.7.17).
[3] *Ibid.*, No. 127, XV (26.1.18). [4] Despatch 220 (R.I.M.B./Gen./210).
[5] (Printed) *Weekly Report*, No. 115, X* (27.10.17). [6] B. 1162.
[7] (Printed) *Weekly Report*, No. 108, X* (8.9.17).

Rideau Junction. The output of the national factories at Trenton and Renfrew was not further increased and during the summer of 1918 averaged 2,000,000 lb. per month.[1]

(c) CORDITE.

In October, 1914, the possibility of obtaining supplies of cordite from Canada was first considered, and the capacity of the Canadian Explosives Company, Limited—the only firm in Canada then manufacturing military explosives—was extended to produce cordite on a large scale. The high cost of production, the uncertain output and difficulties with raw materials all hindered progress, and it was not until January, 1916, that large orders were placed for cordite and export to England began. In that month the Board contracted with the Canadian Explosives Company, Limited, for 5,000,000 lb. of cordite to be delivered before the end of May, at the rate of $1 per lb.[2] The Ministry of Munitions wished Canada to supply sizes 11 and 16 instead of size 8 as previously, and the company agreed to make the necessary changes in their plant at a cost of approximately $80,000, but in the following May no cordite of size 11 had yet passed the tests at Quebec and the whole output still consisted of size 8.[3]

The output of cordite in Canada was increased in August, 1916, by improved methods of acetone recovery, and the surplus production was accepted by the Board at a reduced price. In 1917 the Canadian Explosives Company constructed a state factory at Nobel, Ontario, known as the British Cordite Company. This factory started work in July, 1917, and by the end of the following month had produced 1,194,316 lb. of nitric acid, 109,647 lb. of nitro-glycerine, 248,457 lb. of gun-cotton and 40,000 lb. of finished cordite.[4] The output had risen by December, 1917, to 1,351,567 lb. of finished cordite, of which 1,000,000 lb. were exported.[5]

When the quantity of 18-pdr. ammunition to be supplied by Canada was reduced in July, 1917, no further orders for cordite were placed with private companies in Canada, and all requirements were supplied by the state factory at Nobel. These works were operated at a fixed commission on each pound of cordite produced, and the site and factory were the property of the British Government. Financial difficulties in 1918 prevented any extension of cordite orders in Canada, and during the summer months the output averaged 1,500,000 lb. per month.[6]

(d) ACETONE.

Early in 1916 two distilleries in Toronto, which had formerly produced alcohol from grain and molasses, were converted into the British Acetone Factory for making acetone by the Weizmann process,[7]

---

[1] (Printed) *Weekly Report*, No. 154, XI (10.8.18); No. 159, XI (14.9.18); No. 164, XI (19.10.18); No. 168, XI (16.11.18).
[2] D.D.G. (B) 47. (Cable 704.)
[3] B. 451.
[4] (Printed) *Weekly Reports*, No. 115, X* (27.10.17).
[5] *Ibid.*, No. 135, XIV (20.3.18).
[6] *Ibid.*, No. 154, XI (10.8.18); No. 159, XI (14.9.18); No. 164, XI (19.10.18); No. 168, XI (16.11.18).
[7] HIST. REC./H./1530/16.

the directors placing their plant at the Board's disposal for the duration of the war. Their works operated at Toronto and Terre Haute, and produced 2,563 tons of acetone between January, 1917, and November, 1918.

The Board also placed an order with the Standard Chemical Company for 325 tons of acetone in June, 1916, and a further contract for 1,000 tons to be delivered during 1917,[1] at the rate of 19 cents per lb. When the time came for delivery, the cost of manufacture proved to be much higher than had been estimated when the contract was made; the company made an actual loss on the acetone, and were only enabled to continue working by the profit they made on their alcohol.[2] As higher prices for acetone were being paid to American contractors, the Board decided to pay the company 21 cents per lb. for their production in 1917, and made a further contract for 1918 at the fixed rate of 22½ cents per lb.

A process for the catalytic manufacture of acetone from calcium carbide was worked out at McGill University, Montreal, and experimental plant was erected by the Shawinigan Water Power Company to carry out the project. The company supplied carbide at cost price from its existing plant to the Canadian Electric Products Company, and agreed, in April, 1916, to deliver 3,600 tons of acetone[3] at cost price plus 12 per cent. profit and a fixed sum per lb. to cover amortisation. When the practical difficulties of starting the new process had been overcome by May, 1917, 200 tons of acetone were delivered, but later in the year the factory was adapted for the production of acetic acid, for which an increased demand had arisen.

Experiments were carried out successfully in 1917 by the British Acetones Company, Toronto, for the conversion of butyl alcohol into methyl ethyl ketone at a low cost and with a satisfactory yield.[4] The methyl ethyl ketone was used as a solvent by the Canadian Explosives Company Limited, in their cordite factory, with good results.

In the closing stages of the war the output of acetone in Canada averaged 304 tons per month, of which 148 tons were supplied by the Standard Chemical Company and the remainder by the national factory known as British Acetones, Limited.[5] The acetone supplied during the war amounted to 8,594,820 lb., the cost of which was $2,319,368·90, an average of 27 cents per lb.

III. Non-Ferrous Metals.

The Canadian contribution during the war includes important non-ferrous metals, such as copper, aluminium, nickel, molybdenum ores, tungsten and zinc.

Although the Canadian output of molybdenum prior to 1915 was negligible, the situation was investigated by the Mines Department, and in January, 1916, the first order for 20 long tons of molybdenite was placed by the Board. This order was not completed, but two

[1] B. 745.
[2] Despatch 825 (R.I.M.B./Gen./225).
[3] D.D.G. (B) 47.
[4] (Printed) *Weekly Report*, No. 101, X* (21.7.17).
[5] *Ibid.*, Nos. 154, 159, 164, 168, XI (August–November, 1918).

other firms experimented successfully in producing ferro-molybdenum from concentrates, and in May, 1916, orders were placed on behalf of Russia for 300 tons. A technical expert was then lent to the Board by the Mines Department, and an embargo was placed upon export until government contracts had been fulfilled. On 1 December, 1916, a contract was placed with the Canadian Wood Molybdenite Company for 300,000 lb. of molybdenum sulphide; and, after this mine had been taken over by the Dominion Molybdenite Company, it was improved to produce 4,000 lb. of molybdenum sulphide per day, from October, 1917. Thenceforward a continuous supply of molybdenum sulphide and ferro-molybdenum was available from Canada.[1]

Copper and zinc were obtained from the Consolidated Mining and Smelting Company's mines at Trail, British Columbia, but the output of copper averaged only 200 tons per month. The zinc ore obtained was of low grade, containing cadmium, as all the high-grade ore obtained in Canada had to be exported to the United States on old contracts. In March, 1916, orders were placed for 5,000 tons of zinc for the Russian Government, 10,000 tons for the British Government and 2,000 tons for the Board; and in May, 1916, the Ministry of Munitions placed a further order for 6,500 tons, $400,000 being advanced to the company on condition that plant was erected to produce an additional 20 tons of zinc per day at 15 cents per lb. The average monthly output of zinc from Trail during the last year of the war was 100 tons, but the surplus due to the cessation of the Russian demand was absorbed by the United States.[2]

With regard to tungsten, the Board made a contract with the Holjohn Company in June, 1916, for 36 gross tons of concentrates for delivery by August, 1917. No deliveries were made, however, and, as the quality of the ore was found to have been over-estimated, the Board decided to cancel the contract and depend upon purchases from the Yukon district.[3]

The supply of aluminium caused grave anxiety to the British Government, as half the world's total output was produced by the Aluminium Company of America. This company had a branch in Canada, known as the Northern Aluminium Company, and in 1915 the Ministry of Munitions tried to reserve the whole of the Canadian output for the British Government on condition that 25 per cent. was retained for the manufacture of munitions in Canada. They found, however, that a large part of the 1916 output had already been sold for commercial use, and only after considerable difficulty was the company induced to guarantee 5,000 tons annually for the Ministry from the Canadian plant. The company failed to maintain the promised rate of delivery, and on 1 January, 1917, were 690 tons in arrears. After urgent representations from the Board, the Northern Aluminium Company therefore agreed to transfer all but two of their

[1] (Printed) *Weekly Report*, No. 118, XIII (17.11.17); M. 309, 341; R.I.M.B./M./1.
[2] *Ibid.*, No. 100, X* (14.7.17); B. 133; Despatch 692 (R.I.M.B./Gen./224); M. 266.
[3] M. 719; Despatches 964, 1115 (R.I.M.B./Gen./225, 226).

contracts to the American branch, and to devote practically their whole output to the needs of the British Government.[1]

IV. Timber.

In addition to the mineral wealth of Canada, her timber supplies were of the very greatest importance in the later stages of the war. The development of aviation made unprecedented demands upon timber suitable for aeroplane construction, and the Sitka spruce in British Columbia was found to be admirably adapted for the purpose. So great was the demand that the Canadian Government placed an embargo on the export of aeroplane spruce from British Columbia, except under a licence issued by the Board,[2] and the selection and cutting of the timber was organised by Mr. Austin Taylor for the Board.

The best spruce came from Queen Charlotte Islands, and in February, 1918, three hundred loggers were at work at Masset Inlet, felling 4,000,000 ft. of spruce during the month. At first the timber was shipped in tugs and barges to be sawn at the Georgetown Saw Mills, Prince Rupert, but as transport difficulties caused unnecessary delays, five saw mills were established at Masset Inlet to operate exclusively in cutting aeroplane spruce for the Board. The lumber was then shipped to Prince Rupert, where it was transferred to the railway and despatched to the Atlantic seaboard without transhipment, and thence by steamer to England.[3]

In the first nine months of 1918, 14,000,000 ft. of spruce and 6,750,000 ft. of fir were shipped from British Columbia, and the Board reported that the Sitka spruce on the mainland and in Queen Charlotte Islands would be completely logged within a year and no large new areas were available.[4]

V. Shipbuilding.

When the submarine menace made the question of tonnage one of the most vital problems of the war, the Admiralty approached the Ministry of Munitions (December, 1916) as to the possibilities of steel shipbuilding in Canada. The Ministry considered that the prospects were favourable and sanctioned the appointment of the Imperial Munitions Board as agents of the Ministry of Shipping in Canada. In April, 1917, contracts were placed for the construction of 27 steel ships, with an aggregate dead-weight of 129,900 tons.[5] The Board appointed Colonel W. I. Gear, Director of Steel Shipbuilding, and entrusted to his supervision the building of steel ships and the control of the shipyards.[6] The number of ships contracted for was subsequently increased to 44, and in November, 1917, 13 keels were laid down,[7] but progress from this date became very slow and the work was hindered, not only by labour shortage and unrest, but also by the impossibility of obtaining the steel and other materials contracted for in the United

[1] Despatch 554 (R.I.M.B./Gen./216); see also Vol. VII, Part III.
[2] Despatch 1672 (R.I.M.B./Gen./211). [3] Despatch 1775 (R.I.M.B./Gen./211).
[4] (Printed) *Weekly Report*, No. 168, XI (16.11.18).
[5] *Ibid.*, No. 99, X* (7.7.17). [6] *Ibid.* [7] *Ibid.*, No. 127, XV (26.1.18).

States, after the entry of that country into the war. At the date of the Armistice, no steel ship had been launched.

If steel shipbuilding proved disappointing, the wooden shipbuilding programme met with complete success. The wealth of timber in Canada gave special facilities for the construction of wooden ships, and in April, 1917, the Canadian Minister of Finance made a special grant towards its development. The Board appointed Mr. R. P. Butchart, President of the Vancouver Portland Cement Company, Director of Wooden Shipbuilding, with Captain J. W. Troup, Manager of the Canadian Pacific Railway Steamships, as assistant director.[1] The work was done partly on the St. Lawrence and in the Eastern Maritime provinces, and partly in British Columbia, where the Board had six shipyards completely equipped with modern machinery and labour-saving devices.[2] By December, 1917, 26 keels had been laid down in the shipyards of British Columbia, and after keen competition amongst the different contractors, the first wooden steamer, the "War Songhie." was successfully launched at the Foundation Company's yard, Victoria.[3] Freight congestion and the United States railway embargo on steel hindered the progress of shipbuilding, and in May, 1918, a strike of 3,500 employees nearly closed down the shipyards in British Columbia. In June, the strike was settled by large concessions to the work people,[4] and by the following month 21 wooden vessels had been successfully launched.

The programme in Eastern Canada was delayed by the long winter and difficulties in delivery of timber, but, with the improvement in weather, excellent progress was made. Three vessels were launched in June, 1918, and except for one vessel building at St. John, New Brunswick, the Board believed that the programme for the year would be completed.[5]

VI. Difficulties in Carrying Out the Munitions Programmes.

In addition to the financial difficulties, which are considered in the following chapter, the carrying out of the munition programmes was hampered by labour unrest, lack of trained inspectors and scarcity of tonnage.

(*a*) LABOUR.

The industrial development of Canada could not be accomplished without great dislocation of labour. The growth of munition factories was rapid, and by November, 1918, there were over 250,000 men and women directly employed on munition work in Canada,[6] while the difficulty of adjusting the rates of wages for skilled and unskilled labour, respectively, was proving as troublesome a problem in Canada as it did in the United Kingdom. Machinists or lathe hands tended to disappear, their place being taken by operators selected from unskilled men or women. The only skilled workers left were toolmakers, toolsetters and millwrights, whose scanty numbers were being still

[1] (Printed) *Weekly Report*, No. 99, X* (7.7.17).
[2] *Ibid.*, No. 127, XV (26.1.18).
[3] *Ibid.*, No. 135, XIV (30.3.18).
[4] *Ibid.*, No. 154, XI (10.8.18).
[5] *Ibid.*
[6] *Ibid.*, No. 99, X* (7.7.17).

further depleted by the fact that they could earn higher wages on a piecework scale as operators, so that many preferred to drop from the ranks of the skilled workers, and join the operators.

In the summer of 1917, there was considerable labour unrest in Canada, accompanied by increasing agitation on the part of the trade unions. The Board believed that this agitation was artificial in character.[1] The Fair Wages Clause had been introduced into munition contracts since July, 1916, in deference to the wishes of the British Government, and in view of the extraordinarily high wages paid to munition workers, as compared with the ordinary rates paid either then or before the war to similar classes of labour, it was idle to pretend that wages were an important factor in the agitation. The position of trade unions in Canada was not so firmly established as in Great Britain, and they saw in the conditions created by the war an excellent opportunity for strengthening it. When the Board refused to allow itself to be used as a lever for compelling employers to recognise the trade unions,[2] the agitation redoubled in intensity, and strikes occurred in munition works and explosives factories in various parts of Canada. In May, 1918, the unrest spread to the shipbuilding yards in British Columbia, where, although wages had been increased to conform with the scale paid by the United States Shipping Board, and the unions' claim for an additional 10 per cent. increase had been investigated by a special commission, a strike broke out which paralysed the yards and brought shipbuilding to a standstill. The workers only agreed to resume work when practically all their demands had been conceded.[3]

The Military Service Act and the growing industrialisation of Canada placed a premium on labour in all forms; as Mr. Flavelle pointed out (January, 1917): "It is well to bear in mind that the labour and factory situation in Canada has undergone an almost drastic change, and it is exceedingly difficult to arrange for new work to be undertaken."[4]

(*b*) Inspection.

The great difficulty in munition inspection in Canada, as elsewhere, lay in the lack of trained inspectors. There were too few assistant inspectors, and the district inspectors were called upon to superintend areas which were beyond their powers. When Colonel Edwards investigated the system in November, 1916, he found that contractors' works were not visited as often as once a week. Too much was left to the discretion of the examiners, who were often insufficiently trained and lacked knowledge of the standards required, and who sometimes performed the duties of assistant inspectors—such as supervising the testing of steel and the selection of proof shell.[5] Inefficient inspectors naturally had little influence with the manufacturers and failed to impress upon them the vital importance of good workmanship and the necessity for high standards. Another source of difficulty was the fact that the officials responsible to the Board were often at cross

[1] Despatch 860 (R.I.M.B./Gen./225). [2] *Ibid.*
[3] (Printed) *Weekly Report*, No. 139, XIV (27.4.18).
[4] Despatch 501 (R.I.M.B./Gen./216). [5] Hist. Rec./H./900/17.

purposes with the inspecting officers, and orders were sent out by the two bodies without each other's knowledge.

In August, 1916, matters came to a crisis. Of a consignment of 18,000 6-in. shells from the Montreal Locomotive Company passed by Canadian inspectors, all but 10 per cent. were subsequently rejected on re-examination in England.[1] "Even to a layman the shells are obviously bad," cabled Mr. Brand. "The Inspection authorities say, literally hundreds would cause the gun to burst and thousands would fall among our own men . . . That the Canadian department should pass such stuff as fit for use has convinced people that Canadian inspection must have something radically wrong with it."[2]

Both the Board and the Ministry of Munitions were seriously alarmed, and Colonel W. E. Edwards, Assistant Deputy Director to the Home Inspection Department, was sent to Canada to make a searching investigation. He reported that the staff was too small for the work in hand, and six expert assistant inspectors, followed by ten shell examiners were sent from England, while ten Canadian inspectors were sent to England to learn the standards of inspection required. Training schools were also arranged at Montreal and Toronto, as the Board considered many of the examiners were not sufficiently trained to ensure a uniform standard of inspection. The Canadian Inspection Department was also brought into closer touch with the Inspection Department at home.[3] All communications from the Ministry of Munitions to the Chief Inspector in Canada had hitherto passed through the Board and its representative, but direct communication was now established with the Inspection Department, and the only function relating to inspection retained by the representative was cabling advice about the issue of specifications and drawings. Between October, 1916, and February, 1917, the assistant inspectors were increased from 20 to 50, and the examiners from 2,041 to 4,802, while the shell examination staff was considerably strengthened. These changes produced excellent results. The quality of Canadian shell showed marked improvement, and on 13 May, 1918, it was decided that the re-inspection of Canadian shell in England might be discontinued, the percentage of rejections from all causes having fallen to 0·87, of which only ·0435 per cent. represented serious defects.[4]

(*c*) TONNAGE.

Until the close of 1916, except for a few short periods, the Admiralty provided sufficient ocean tonnage to ship all the munitions and materials that Canada produced. The temporary shortages were followed by periods when increased tonnage was available, enabling arrears as well as current output to be exported. But in November, 1916, the situation changed, and from that date no complete clearance was possible. Munitions accumulated at the plants, on the cars in transit, and at the docks, until the congestion became so great, that the Board were compelled to construct buildings for storage. By the orders of the Ministry of Munitions, all the T.N.T. Grade 3, and 8-in.

---

[1] M. 676; M.C. 80.
[2] M.C. 82.
[3] See above p. 26.
[4] D.F. 3/P.A.C./37.

and 9.2-in. shells were stored, and instructions as to the priority in which gun ammunition was to be shipped were issued each month. In May, 1917, only 89,000 tons of shipping space were available for Canada during the month, although the Board had advised the Ministry that they would require 116,000 tons.[1] This tonnage included not merely shells, but aluminium, steel bars, steel ingots, rails, locomotives, car wheels, nickel, acetone and carbide. The accumulation awaiting shipment was steadily increasing, and with 45,000 tons already in store, the storage problem was becoming daily more acute.

The shortage of the wheat shipments in the autumn of 1917, afforded some measure of relief and left extra tonnage available for munitions, but this was neutralised by losses from submarine action. In January and February, 1918, only 44,000 and 50,000 tons, respectively, were available for Canada, and the great demand for agricultural machinery in Great Britain led the Government to give it priority in shipping. Again in March, 1918, owing to the grave danger of a food shortage in the United Kingdom, cereals and other foodstuffs were given absolute precedence over all other commodities by order of the British Government. All tonnage from Canadian ports was diverted to carry cereals, except for a small amount of munitions carried on auxiliary cruisers, and the Board were ordered to store their whole output of cordite and nitrocellulose for March and April, and possibly for three months further. All classes of munitions were therefore, diverted to storage, except a small quantity of acetic acid, acetone, agricultural machinery and ferro-silicon—some 3,000 tons in all.[2]

When the food crisis became less acute, more tonnage became available for conveying munitions from Canada, and the closing months of the war showed a steady improvement. In July, August and September, 1918, 48, 50 and 62 steamers respectively, cleared with munitions for the United Kingdom and France, the total tonnage of which amounted to 67,000, 72,000 and 83,000 tons, while in September, 43,620 tons were cleared over and above the Board's allotment.[3]

---

[1] (Printed) *Weekly Report*, No. 101, X.* (21.7.17); B. 3393.
[2] M. 3874; B. 5603.
[3] (Printed) *Weekly Reports*, Nos. 159, 164, 168, XI (September–November, 1918).

CHAPTER VI.

CANADIAN MUNITIONS FINANCE.

I. Finance of the Shell Committee.

The whole expenditure of the Shell Committee was met by the Imperial Government, and the funds disbursed between September, 1914, and December, 1915, were as follows :—

(1) Sums paid to the High Commissioner of Canada, by the War Office and refunded to the War Office by the Ministry of Munitions :—

	£
26 September, 1914	50,000
15 December, 1914	100,000
19 May, 1915	2,000,000
16 July, 1915	1,000,000
13 August, 1915	1,000,000

(2) Amounts paid through Messrs. Morgan's account :—

	£
29 October, 1915[1]	1,000,000
4 November, 1915	1,000,000
	$
20 November, 1915	10,000,000
20 December, 1915	11,000,000
23 December, 1915	5,000,000

(3) Gold reserve in Canada used :—

21 October, 1915[2] / 10 November, 1915 ..	£3,139,523 7 5[3]

By 15 February, 1916, the British Government had advanced £27,000,000 to Canada.

In the early days, the Committee furnished account of all expenditure to the Minister of Militia and Defence, through Colonel Benson.[4]

On 27 April, 1915, Mr. Borden, Postmaster-General of the Overseas Forces and Accountant of the Department, was made finance member of the Committee with the special purpose of seeing that a proper account was rendered of money advanced through the Militia Department. He found the procedure by which money was advanced complicated ; the British War Office paid funds to the Canadian Finance Department who passed them on to the Militia Department, by whom they were handed over to the Shell Committee. On Mr. Borden's suggestion, this procedure was simplified and funds were henceforward placed directly at the disposal of the Shell Committee by the Canadian Finance Department.

---

[1] Date of Treasury letter.
[2] Date of Treasury authority.
[3] $14,600,000.
[4] Hist. Rec./R./1142/26.

At the end of August, 1915, the Treasury had under consideration the serious exchange difficulties in America and Canada, and, on 2 September, the Master-General of the Ordnance informed the Minister of Militia that no further orders must be placed in Canada involving payment during September or October, and that payments during November must be kept down as much as possible.[1]

Mr. Hichens reporting (22 November, 1915), on the financial arrangements of the Committee, said that the position was full of anomalies. The Shell Committee indented on the Canadian Militia Department who forwarded the requisition to the Canadian Treasury. If there were funds available, the requisitions were met, if not, as neither the Treasury nor the Militia Department recognised any financial responsibility for the Shell Committee, they were ignored. At the time of his visit he discovered that the Committee had been without funds for some time, and that accounts to the extent of over $10,000,000 had been outstanding for a long while. The Canadian Treasury advanced $1,000,000 as temporary relief, and consented to give the guarantee of the Dominion Government (pending the guarantee of the Imperial Government), without which the Bank of Montreal refused to make further advances.[2] Subsequently in November, 1916, the sums of $114,473.71 and $1,017,164.77, representing the overhead charges of the Shell Committee for administration and inspection, appeared in the accounts of the Imperial Munitions Board.[3]

II. First Loan by the Canadian Government.

Between December, 1915, and February, 1916, the following remittances were paid through Messrs. Morgan's account by the Treasury :—

	$
29 December, 1915	5,000,000
14 January, 1916	8,500,000
19 January, 1916	8,500,000
15 February, 1916	5,000,000

At the same time, the Dominion Government, while still disclaiming financial responsibility, gave its first indication of the community of interest between itself and the newly created Imperial Munitions Board in its work of developing the resources of Canada for the supply of munitions of war. In December, 1915, the Canadian Minister of Finance set aside $50,000,000 of his recent domestic loan of $100,000,000 as a loan to the Imperial Government for the use of the Imperial Munitions Board. Payment was to be spread over January, February and March, 1916. By 31 March, $45,000,000 of the loan had been advanced, leaving a balance of $5,000,000, which was held over until the proceeds of the Canadian Banks Loan[4] which then became available, were exhausted, viz., at the end of July.[5]

---

[1] C.R. 3989. [2] 94/Gen./226. [3] M. 1454 ; B. 1942.
[4] See below, p. 58. [5] M. 1923 ; B. 2625.

III. The Finance of the Imperial Munitions Board during 1916.

(*a*) Canadian Bankers' First Credit.

In February, 1916, the Treasury, in consequence of the very serious state of the exchange, were reluctant to place increased orders in Canada unless the commitments of the Board for the next six months could, in part at least, be met by local credit. The Canadian Minister of Finance, approached by Mr. Flavelle, would not commit himself to a direct further advance, as he had a large increase of expenditure, as well as certain railway advances, to meet. He recommended, however, that the Canadian banks should be approached with proposals either (1) to purchase Imperial one year or six months' Treasury Bills, or (2) to discount bills drawn payable in Canada by English banks, or (3) to open a credit for the Imperial Treasury on the security of Treasury Bills, or (4) to open credit for British banks upon security lodged in London. He discountenanced the suggestion that a loan should be raised in the United States, as he intended to go there himself in the near future to meet the needs of his Government.

The Chancellor of the Exchequer discussed this proposal with the representative of the Imperial Munitions Board, and expressed a preference for either the first or third of the methods suggested. He pointed out that bills would be payable in currency, but the banks would not be free to borrow against them in the United States if they were taken as collateral, or to re-discount them there ; during the war the Chancellor of the Exchequer could not permit Treasury notes to be placed on the American market except under the direction of the Treasury.

On 1 March, 1916, the Minister of Finance conferred with a committee representative of the following banks—the Bank of Montreal, the Bank of Commerce, the Dominion Bank, the Royal Bank and the Bank of Ottawa. Mr. Flavelle was also present. It was then unanimously agreed that the Bankers' Association should be recommended to make a credit of $50,000,000, possibly of $75,000,000, on Treasury Bills held in London, the loan to run for one year and, at the option of the Treasury, to be renewable for another year. This decision was influenced by the possibility that new business of approximately that value might be placed in Canada, but the suggestion was accepted that the credit should not be held against the new business, but should be immediately applicable on the old business.

The Bankers' Association subsequently met and confirmed the recommendations of the committee and a subscription list was immediately opened.

The ultimate result was that the banks pledged themselves to a credit of $75,000,000, which sum was increased to $76,000,000 by one of the banks raising its subscription at the last moment. The terms for the loan were, commission half per cent., and interest five per cent., paid quarterly ; renewal for a further year at the option of the Treasury was to be at the same rate unless a lower rate were agreed on. The entire loan became due for repayment on 1 April, 1917, with an option of renewal for one year. The Minister of Finance acted as

trustee for the banks, and the Treasury deposited in the Bank of England, to his credit as trustee, the value of $76,000,000 in Treasury notes. Each bank received a certificate from the Minister of Finance acknowledging the payment on behalf of the Imperial Government.

Formal advice of this credit to the Imperial Treasury was made by the Chairman of the Imperial Munitions Board to the Ministry of Munitions on 24 March, little more than three weeks after negotiations had been started. Treasury approval was received on 25 March, 1916.

(*b*) Canadian Bankers' Second Credit.

The payment of the first bankers' credit had been spread over April, May and June, and with the approaching exhaustion of the loan it became necessary in the beginning of June to make further arrangements to finance the Imperial Munitions Board.

The financial position of the Board at this time was as follows :— By the end of April, 1916, orders to the total value of $452,000,000 had been placed in Canada. Payments to the extent of $171,000,000 had been made, of which, roughly, $100,000,000 had been found by the Imperial Government, $45,000,000 by the Canadian Government, and $25,000,000 by the Canadian banks. This left a balance of outstanding obligations of $281,000,000. During May and June orders to the extent of $10,000,000 to $15,000,000 were placed with the Board, leaving a balance of commitments at the end of June of about $245,000,000.[1]

The state of the American exchange was such that it did not seem likely that accommodation could be obtained there. A further appeal to the bankers was considered, and it was suggested that the shipment by the Treasury of $50,000,000 of gold to Canada, in payment for July and August, would produce a good effect on the Canadian bankers and dispose them towards a further advance, but the Treasury could not arrange for this.

Meanwhile, Mr. Flavelle had approached the bankers. Here, too, the moment was not very propitious, as the Minister of Finance, who had deferred his pending domestic loan for a few months, feared lest the banks should endanger their ability to meet his calls on them later. Subject to this, however, the bankers appeared willing to make further advances at the beginning of July, provided that new orders to the amount of the advance should be placed in Canada.

It was difficult for the Imperial authorities to accept this stipulation. The Treasury was more than ever desirous of cutting off, as far as possible, all orders outside the United Kingdom unless actually covered by credits in the United States or Canada. The Ministry of Munitions also had recently decided, owing to financial difficulties, to limit the American contracts to 31 October, and to endeavour to dispense with them as from that date, a policy almost immediately abandoned, as a consequence partly of Sir Ernest Moir's representations and partly of the inauguration of an increased gun ammunition programme in October, 1916. Though the general policy, therefore, both of the

[1] Letter of 23 June, 1916, from the representative of the Imperial Munitions Board to the Chancellor of the Exchequer.

Treasury and the Ministry, was to give Canada the preference in all orders placed abroad, there was permanently present the limiting factor of allowing as little expenditure as possible outside the United Kingdom, while the very large number of orders placed in the United States at the beginning of the war and Canada's inability to fulfil some of the Allied requirements gave the former, unavoidably, a certain amount of preference.

It was at first suggested that the bankers' further credit would amount to $50,000,000, and possibly $75,000,000, but in June it appeared that the Canadian bankers were disposed to withdraw, and they finally agreed to an advance of $24,000,000 only, for one year, on the same terms as the preceding loan. Half of the advance was unconditional ; it was at first proposed that the other half should be earmarked for certain prospective orders for Russian requirements, but this condition was subsequently withdrawn by the bankers on an informal understanding that the Treasury, if required to do so, would repay the money if the Russian orders were not eventually placed in Canada.

Payment of this loan was spread over July and August, in two equal instalments, of which the first was paid on 1 July.

(*c*) The Imperial Munitions Board Financed by the Treasury, July–October, 1916.

The general situation in July, 1916, was that Canada had so far provided a sum of $150,000,000, which had met all payments from February to July, inclusive, and accordingly had relieved the exchange situation so far as Canadian munitions were concerned.[1] But both the bankers' credits were now on the point of exhaustion, no loan was to be expected before the close of the year, when the Minister of Finance would have floated his new domestic loan ; it remained, therefore, for the Treasury to provide funds for three, at least, out of the ensuing four months.

Furthermore, as a result of the greatly enlarged programme for heavy shell, there was no prospect of reducing orders, either in Canada or in the United States, and the Minister found it necessary to arrange for the continuation of all existing orders for heavy shell in the United States and, as occasion arose, in Canada, while new orders for 9·2-in. shell were to be placed in Canada to the value of $31,200,000.

This placing of very large new orders in Canada meant an aggravation of financial difficulties already intensified by the enormous demands of the Allies in other directions. It was strongly felt both by the Representative of the Imperial Munitions Board and by Mr. Perry, that the Canadian Government should be informed very fully on the whole situation so that its bearing on future payments for Canadian munitions might be understood and it might not be unprepared if suddenly called on for help. It was specially felt that the Canadian banks did not realise the position. " The burdens of the banks and the burdens of taxation," Mr. Brand wrote on 1 July, " are

[1] B.C. 117.

immensely greater in this country than in Canada, and if, as no one doubts, Canada is in, like we are, up to her last man and her last dollar, then obviously it is right that her banking community should fully realise what this may mean. It is no good waiting until the damage is done, and our credit is destroyed by a collapse in the exchanges."[1]

The Treasury took no action until the close of July, when the Board's credit was on the eve of exhaustion. The crisis was temporarily tided over by the Treasury agreeing to find the sum required in Canada for the week ending 5 August out of their New York funds, and also agreeing to place $6,000,000 a month at the Board's disposal in New York for payment for fuses and raw material.[2]

At the same time the Treasury urged that the Dominion Government, pending further arrangements for credits, should meet the current requirements of the Munitions Board after 5 August, as, in view of the heavy demands on the Treasury's limited dollar resources in New York, the Chancellor of the Exchequer was very anxious not to have to draw upon them for internal payments in the Dominion.

Both the Minister and the Representative of the Board had pointed out that such a request was likely to arouse resentment. The Imperial Munitions Board, unlike the former Shell Committee, was merely an agency of the Ministry; the somewhat difficult position, therefore, created by the Treasury action was that H.M. Government, while placing large orders for munitions in Canada without consultation with the Canadian Government was, in effect, asking that Government to meet the obligations thus incurred.

This point of view was forcibly expressed by the Minister of Finance in his reply to the Treasury, received on 6 August. He had, he stated, repeatedly advised the Board that, in view of his rapidly increasing war expenditure, he could not undertake further advances, and the banks had to provide for the coming domestic war loan and the financing of Canadian crops. If the position of the banks permitted it, he would endeavour to arrange further credits from time to time, but it must be clearly understood that no definite engagement could be entered into, and the Imperial Treasury must assume all financial obligations in Canada, subject only to such help as the banks might afford at intervals.

The Chancellor of the Exchequer thereupon replied that the Treasury telegram had not intended to imply that the Dominion Government was under any obligation to finance the Imperial Munitions Board, but was solely an appeal for all possible assistance in an increasingly difficult situation. In the circumstances, the Chancellor now agreed to finance the Imperial Munitions Board expenditure out

---

[1] Shipment of gold from England was again suggested but negatived by the Bank of England, which suggested as an alternative that the Imperial Munitions Board should ship gold themselves, by arrangement with the Canadian Government, from New York. This they could do whenever the Imperial Government provided them with dollars in New York. They would have to forego profit if the exchange were against them. The Treasury would probably have to make good the vacuum if Canada took gold from New York, but was prepared to face this (B.C. 106; M.C. 76).

[2] M.C. 71; B.C. 106.

of dollar funds in New York for so long as such funds were available, since financing from London would necessarily lead to the breaking of both Canadian and United States exchanges.

During the next three months, accordingly, the Treasury supplied full remittances. The expenditure of the Board at this time averaged five to seven million dollars a week. The remittances made in August were for $26,500,000; in September, for $26,000,000 and in October, for $28,000,000.[1] All remittances were made on the understanding that, should disbursements fall short of the estimate, subsequent transfers should be correspondingly diminished. Payments were made weekly, and the estimated expenditure for October included, with the consent of the Treasury, $1,375,000 interest on the Canadian bankers' loans.[2]

Throughout this period, in order to secure the advantages of the exchange, Messrs. Morgan were instructed to pay all credits due to the Imperial Munitions Board, into the Bank of Montreal in New York, whence the Board arranged the transfer to Ottawa.

(*d*) THE SECOND CANADIAN GOVERNMENT ADVANCE.

On 2 September, the Minister of Finance met the bankers, and arrangements were made for a domestic loan which was successfully launched on 13 September. The amount raised was $100,000,000, of which $50,000,000 was to be underwritten by the bankers. Sir Thomas White then offered to assume part of the burden of munitions expenditure by an advance of $50,000,000, to be paid in two equal instalments in November and December.[3]

Mr. Brand suggested that it might be advisable for the Minister of Finance to earmark all new advances for the purpose of future orders, as, if advances were utilised in making payments on existing contracts, there might be a tendency to place new orders in the States rather than in Canada, on the ground that no arrangements had been made to finance them.[4] Sir Thomas White, on being consulted, said that he did not want to make the advances a matter of bargain, and would prefer to offer them without condition.

Mr. Brand's reasons for the suggestion were elaborated in a letter addressed by him to the Minister of Finance on 10 October. The question involved more than merely securing some advantage for Canada. It was equally important for Great Britain, and indeed for all the Allies, that during the continuance of the war they should obtain everything possible from within their joint territories, and thus lessen the drain of gold or its equivalent to neutral countries. This principle, while theoretically recognised in official quarters, was, he thought, often imperfectly applied in practice; the attitude of individuals was often that it made absolutely no difference to the British Government whether orders for munitions were placed in Canada or the United States, and that the order should always go

[1] M.C. 73; B. 912, 949, 951, 952, 988, 1032, 1122.
[2] Treasury letter, 3 October, 1916, to the Ministry of Munitions.
[3] B.C. 140, 155. [4] M.C. 87.

to the United States if there were the least advantage in price. Practically, Canada was treated as an ally when it was a question of providing money, and as a neutral when it was a question of deciding where it was to be spent. Canada was, it is true, getting a great many orders for shells, but these she might reasonably have expected to get had she been a neutral and given no financial assistance; for the Canadian price had for some time past been substantially lower than that of any outside competitor. If Canada financed the war to the utmost of her powers, she should be treated on the same footing as the United Kingdom in the utilisation of her productive capacity.

The Treasury suggested that, in view of this credit of $50,000,000, it would be possible to avoid payment from Treasury funds in New York, for the months of November and December. The Finance Department of the Ministry replied that this could not be done: the monthly requirements for October were estimated at $28,000,000 and the commitments of the Board during the remainder of the year were likely to be equally heavy.[1]

The requirements of the Board for November and December, estimated at $30,000,000 and $32,000,000, were met by the Canadian Government advance, the balance being provided by the Treasury.[2] On 5 January, 1917, the Treasury informed the Ministry that the whole of the $50,000,000 loan had been received, and that the final amount of $5,000,000 had been expended during the last week of December.

(*e*) Position at the Close of 1916.

The Treasury policy was, inevitably, to limit the purchase of munitions both in the United States and Canada. If the Allies continued to purchase munitions and other supplies in the United States at the same rate as heretofore, a serious crisis was likely to arise within a year's time, or even less, owing to the exhaustion of the means of credit. The supply of gold and of American securities existing in the Allied countries was a definite quantity which could not be increased, and was being alarmingly diminished by the rate of Allied Government purchasing in the United States. When it was exhausted no further payments could be made in the United States except in so far as the Allied Governments could float loans there on their unsupported credit. A serious situation would then arise. In the first place, manufactured munitions and war supplies from the United States would be suddenly cut off before adequate means of production had been developed in Allied territories to replace them. Secondly, and here lay the gravest danger, the Allied countries must continue to obtain considerable supplies of certain raw material—copper, nickel and spelter—from the United States if they were to continue their own manufacture of munitions; if their means of payment in the United States failed they would be cut off from this essential supply of raw material.

It was therefore imperative that the limited reserve of gold and securities should be set aside for the purchase of these raw materials.

---

[1] Letter, 11 October, 1916. A.F.S. to Treasury.
[2] B. 1354, 1368, 1629; M.C. 996.

This could only be effected if all the Allied countries set themselves (*a*) to develop in their own territory production both of manufactured war supplies and of the raw materials essential thereto and, (*b*) to obtain the balance from one another's territory rather than from neutral countries.

The Treasury took steps to enforce their policy. A Cabinet decision was obtained to the effect that purchases both in the United States and Canada were to be restricted as much as possible. In order to comply with this decision the Minister of Munitions appointed a small committee, consisting of the head of the supply department making the demand, the Director-General of Munitions Supply, the Assistant Financial Secretary, and the Director of Munitions Contracts, to scrutinise all proposals for purchases in America which were also to be submitted for his approval before being sent to the Treasury for sanction. Further, a letter from the Treasury to the Minister on 15 January, 1917, cancelled the Treasury Minute of 24 January, 1916, under which the Minister was empowered to place a contract up to the value of £50,000 in the United States or Canada without previously consulting the Treasury. Henceforward, this general authority was suspended; the Treasury was to be informed in advance of all important commitments. Contracts up to and including £5,000 in American dollars might still be placed without prior reference to the Treasury, on the understanding that every effort was made to reduce such orders to a minimum.[1]

IV. The Financial Problem of 1917.

(*a*) Canadian Bankers' Third Loan.

In November, 1916, the Imperial Munitions Board began to negotiate for further Canadian credits to meet the financial requirements of 1917. Sir Thomas White was at last in England, Mr. Flavelle was also on a visit to London, so that there was every opportunity for the necessary discussion so long advocated by the Representative of the Imperial Munitions Board, as essential to the full realisation of the situation.

The Treasury attitude has been indicated; the Ministry, on the other hand, whose policy was dictated by the requirements of the War Office, had adopted a large gun ammunition programme, which it was impossible to carry out at home, and which would compel them to place orders either in the United States or in Canada. The programme of orders for shells, high explosives, propellants, fuses, &c., which the Ministry had arranged, subject to Treasury sanction, to place with the Imperial Munitions Board, for delivery from January to June, 1917, amounted to $244,000,000, with a possible increase to $264,000,000. The Imperial Munitions Board was also empowered to enter into contracts for the output of about 400 tons of shell steel in Canada, for the last six months of 1917, having a value of 28 to 30 million dollars. But these orders depended upon Treasury sanction,

[1] Hist. Rec./R./400/27.

and it was obvious that the Treasury would only give their sanction if Canada was willing to assist materially in the protection of the exchange.

The Imperial Munitions Board considered that Canada was prosperous enough to give this help, and Canadian bankers agreed that, since further orders for Canada depended largely on the question of exchange, the banks must use every endeavour to help the mother country.[1]

On 24 December, a cable was received from the Imperial Munitions Board, informing the Ministry that the Canadian banks would lend to the Dominion Government, for transmission to the Board, a monthly sum of $25,000,000 from January to March inclusive, with the possibility of extending the loan to June.[2]

(*b*) Supplementary Canadian Government Advance.

At the beginning of January, the Canadian bankers found themselves unable to arrange for the whole of the promised $75,000,000, and reduced their loan to $50,000,000 to be paid in equal instalments during January, February and March. The Canadian Government thereupon agreed to make up the monthly loan to the agreed amount of $25,000,000.

The monthly requirements of the Board had by this time risen considerably; they were estimated at $35,000,000 for January and February, 1917, respectively,[3] and at $37,000,000 for March, but the total expenditure during these three months exceeded these figures by $7,000,000.[4]

(*c*) Difficulties in April and May, 1917.

During April and May, 1917, the financing of the Imperial Munitions Board was attended by great difficulty. In the first place, the monthly requirements had leaped up to about $50,000,000 a month. It was true that at the beginning of the year, the Imperial Munitions Board had foreseen a monthly expenditure of this amount from January to June, 1917, but the munitions programme had subsequently been reduced and the revised estimates of expenditure had been $35,000,000 per month.[5] The subsequent increase was accounted for by the inclusion amongst the Board's activities of a shipbuilding programme, the commitments for which (partly reclaimable from the Ministry of Shipping), were included in the monthly estimates of the Board.

The help given by the Canadian Government was prompt and generous. Sir Thomas White had brought off in March a very successful domestic loan of $150,000,000, of which $60,000,000 was underwritten by the bankers, who were expected to take, at most, not more

---

[1] It was also possible that the banks might use their credit in New York in connection with British loans secured by collateral, in addition to what they could do in free credits from their Canadian resources. The Minister of Finance had always expressed willingness ultimately to make advances to the banks against such securities. (B. 1422).

[2] B. 1856; B. 2424. This loan, unlike former ones, was not to the Treasury but to the Dominion Government.

[3] B. 1856, 2160. [4] B. 2462, 2757, 2381, 2396; M. 1801. [5] B. 3164.

than half this amount.[1] Mr. Flavelle asked for a loan of $25,000,000 monthly during April, May and June, and the Minister of Finance gave a definite assurance that $25,000,000 should be paid in the middle of April and May respectively, and the possibility of a like sum in June.[2]

The commitments for April were heavy; they were met locally by a deferred payment of $5,000,000 from the March loan, and $25,000,000 from the new Canadian Government loan. The Treasury was asked to supplement these loans by a grant of $20,000,000 in four instalments during April.

It was absolutely essential that issues from the Treasury account in New York should, at this time, be kept within definite limits. The Imperial Munitions Board were therefore informed that the Treasury might be able to make some small advance during the period, 2–12 April, but could not possibly provide the sum of $20,000,000. The Board were asked (*a*) to postpone their requirements as much as possible for the moment, (*b*) to approach the Canadian Government for an immediate advance out of the new loan, (*c*) to consider, and report to the Ministry of Munitions as to any temporary expedients for obtaining funds which might be feasible.[3]

In order to meet the situation, the Minister of Finance agreed to make an immediate payment of $10,000,000 to the Board. Mr. Flavelle also arranged that the Bank of Montreal should advance $5,000,000 in New York to be repaid on 25 April.[4] In order to enable the shipbuilding programme to be carried out, the Minister of Finance also offered an additional advance up to $10,000,000.[5]

By similar expedients, by loans and overdrafts at Canadian banks, commitments in May and June were met[6] but it was becoming obvious, that this system of emergency finance could not continue, and that definite action must be taken to place the financing of Canadian munitions on some precise footing.

Mr. Balfour was at this time in Canada, and the Treasury cabled to him to confer with Sir Thomas White on the general position. The Minister of Munitions was anxious to place further shell orders, but until financial matters were settled, the Canadian shell programme was held up by the Treasury. The outcome of arrangements was the reduction of the Canadian munitions programme.

(*d*) Emergency Finance, June to August, 1917.

June commitments showed a deficit of $20,000,000, which the Board requested the Treasury to meet.[7] Sir Hardman Lever, recently appointed the Treasury's representative in New York, with full authority to settle financial transactions in America, arranged that $20,000,000 should be paid in three instalments of $10,000,000, $5,000,000 and $5,000,000 each during June,[8] while the Minister of Finance, on his side, had arranged with the bankers to loan him $75,000,000—thus

---

[1] B.C. 263. [2] B. 2701; M. 2028. [3] M.C. 153.
[4] B.C. 285, 286. [5] B. 2913; M.C. 154.
[6] B. 2975, 3307, 2648, 359, 363; M. 2553, 181, 184; B.C. 268.
[7] B. 3243; M.C. 199. [8] B. 3305.

ensuring his monthly contribution of $25,000,000 up to and inclusive of August—and had also effected a renewal of the $24,000,000 bankers' loan for another year.

Acting on Treasury instructions, Sir Hardman Lever, subsequent to the payment of a first instalment of $10,000,000, withdrew all definite undertaking to supply funds from New York credits. At the same time he communicated to Sir Thomas White the Treasury decision, that, while purchases made by the Board in the United States would be paid for by funds provided in the United States, all purchases made in Canada must be met from Canadian sources. Sir Thomas White was not prepared to guarantee more than the monthly payment of $25,000,000 up to and including August, and Sir Joseph Flavelle pointed out to the Ministry of Munitions that if this represented the final decision of the two Governments, there would have to be a very serious modification of the programme. The Board refused to accept the responsibility for telling the Canadian manufacturers that their bills could not be met, and asked for direct instructions from the Ministry.[1]

The Imperial Munitions Board met the emergency by arranging for a loan from the Bank of Montreal, acting in conjunction with the Royal Trust Company and the Canadian Pacific Railway, of $10,000,000, secured by Treasury Bills in London.[2]

On 28 June Mr. Brand, who was then in Canada, reviewed the financial position in a cable to Dr. Addison. The Imperial Treasury had only provided $10,000,000 towards the Board's expenditure in June ; of the balance, $25,000,000 had been provided by the Canadian Government, and the remainder scraped together by the Board by means of temporary borrowings from the banks. The commitments for July were expected to amount to $69,000,000, of which the Canadian Government would only undertake to provide $25,000,000, and $44,000,000 were therefore left uncovered. Sir Hardman Lever said that he could not, under the most favourable circumstances, provide more than $25,000,000. Therefore, as matters stood, the Board's commitments during July would not be met, unless further steps were taken. If the Board's commitments were not met in July a financial crisis would occur in Canada, the operations of the Board would be brought to a standstill, and the supply of munitions cut off. The Treasury was ultimately responsible for finding money to finance the orders which it had authorised. If it were unable to do so, further assistance must be sought from the Canadian Government, and, in Mr. Brand's opinion, the Board should be authorised to discuss the matter officially with the Canadian Finance Department and to take steps, acting in consultation with Sir Hardman Lever, to impress on the Canadian officials the serious consequences which failure of funds would create. As the result of this report Dr. Addison communicated with the Treasury and gave Mr. Brand and the Board the required authority to consult with the officials concerned.[3]

The $69,000,000 required for July were obtained by various expedients—by renewing loans from the banks, by anticipating the

[1] B.C. 416 ; B. 3409. [2] B. 3383, 3408, 3422. [3] B.C. 440 ; M.C. 214.

advances from the Canadian Treasury, and by deferring payments on contracts by extending the time of delivery. But these methods could afford merely temporary relief, while they rendered the future financing of the Board increasingly difficult.

(*e*) FINANCIAL NEGOTIATIONS BETWEEN THE IMPERIAL GOVERNMENT AND THE CANADIAN GOVERNMENT, JULY–SEPTEMBER, 1917.

An appeal, originating partly from the necessities of the Imperial Munitions Board, but of a more far-reaching character, had already been made by the Imperial Government to the Canadian Government on 6 June, when Sir Thomas White received an official cable asking him to advance $40,000,000 to the Board during June, and also to arrange with the banks for a loan of $25,000,000 for the purchase of wheat. He then intimated his willingness to assist the Treasury by issuing Dominion currency notes against gold held in South Africa, and also against Imperial notes held in the Bank of England, but would not do so until after his next domestic loan, and then only as a last resource.

This appeal for help was renewed on 5 July, when the Prime Minister, on behalf of the War Cabinet, cabled to Sir Robert Borden. The commitments in Canada from July to September reached a total of $206,000,000 (exclusive of wheat and oats), of which the Imperial Munitions Board accounted for $150,000,000, the Board of Trade purchases of cheese amounted to $40,000,000, and War Office purchases, including running contracts, represented the remaining $16,000,000. Of this total, about $40,000,000 would be for purchases on behalf of the Imperial Munitions Board in the United States, and could be met by the Treasury out of United States credits. The Canadian Government was already furnishing $75,000,000 towards munitions in each month, leaving an uncovered balance of $90,000,000 for the whole commitments. It was essential, the Prime Minister pointed out, that this balance should be covered as quickly as possible by the Canadian Government, as otherwise the British Government had no alternative except to cancel orders in Canada.

In his reply Sir Robert Borden expressed the willingness of his Government to assist in every possible way. The Finance Minister had consulted with Sir Hardman Lever and was prepared to consider an issue of additional notes circulation of $50,000,000, available over the next three months and guaranteed by the high-class securities lodged by the Treasury, either with the Bank of Montreal in London or with himself as Minister of Finance.[1] At the same time he considered that the United States Government should be strongly pressed to permit the Imperial Treasury to use from the United States loans $25,000,000 to $50,000,000 monthly towards meeting their commitments in Canada. The balance of trade between Canada and the United States was greatly in favour of the latter, and the New York exchange was now at a heavy premium.

[1] Sir Thomas White was of opinion that the issue of unsecured circulation would be highly prejudicial, as the market position of Canadian securities was already critical owing to their being debarred from the American market since the entry of the United States into the war.

Dealing specifically with the commitments mentioned in the Prime Minister's cable, the Finance Minister declared his readiness to meet the Imperial purchases of cheese and the War Office purchases of hay, oats and flour (which had been met through the Canadian Department of Agriculture) by the note circulation above mentioned ; but it would not be possible to arrange any further credits for the Imperial Munitions Board. Sir Robert Borden wrote " we are satisfied that the foregoing represents the best we can do in the circumstances." On 16 July the Prime Minister cabled an acceptance to Sir Robert Borden of his offer of an additional note circulation of which the technical details were to be arranged direct with Sir Thomas White.

The Finance Minister was very definite at this stage in disclaiming full financial responsibility for the Imperial Munitions Board. On 22 July he made clear the precise terms on which his Government's assistance was based. In the first place, the monthly subsidy of $25,000,000 to the Board was made dependent upon the Treasury providing without fail $15,000,000 monthly from American sources, this sum representing the cost of materials and other supplies purchased by the Board in the United States. Secondly, the Canadian Government would furnish a loan of $50,000,000 by the issue of new circulation, of which $40,000,000 was to be devoted to the purchase of cheese from July to October, and $10,000,000 was to repay the Dominion Government advances for purchases of hay, flour and oats. Any other money must be found by the Treasury who, in addition, must provide for the repayment to the Bank of Montreal of $10,000,000, which would fall due on 15 August, and of $5,000,000 to the Bank of Commerce on 5 September.

On 11 August, Sir Joseph Flavelle cabled that the Finance Minister was anxious to receive a definite assurance that the Treasury was prepared to guarantee the monthly payments of $15,000,000, and that failing such assurance he might withdraw his own guarantee for fear of being left to bear the whole burden.[1]

Further difficulties were created by heavy payments for food stuffs falling due. The Canadian Finance Minister had to refuse the Treasury request that one half of his promised subsidy for munitions during October and the succeeding months should be diverted to the payment for food stuffs,[2] and the Chancellor of the Exchequer thereupon pointed out (23 August) that the Treasury would now be compelled to devote the monthly $15,000,000 from their New York funds, hitherto intended for munitions, to the purchase of food stuffs. This meant that, allowing the necessary $4,000,000 for shipping and aerodrome expenditure, the munitions programme would have to be reduced to $21,000,000 per month, and the Minister of Munitions so informed Sir Joseph Flavelle on 24 August.[3]

Sir Thomas White's position at this time (September, 1917) was very difficult. There might be strong opposition to money being raised to finance munition orders which was denied to develop the natural production of the country, and the pressure of an ignorant public

[1] B.C. 498. [2] M.C. 240 ; B.C. 515. [3] M.C. 242.

opinion requiring him to finance food stuffs might compel him to abandon further loans for munitions purposes.[1]

Actuated, however, by the belief that the production of ammunition in Canada was of vital importance to the Ministry, Sir Thomas White agreed at the beginning of September, to continue his monthly subsidy from October, 1917, to June, 1918, inclusive, but still maintained that the amount of expenditure in excess of that subsidy, which was now estimated at only $5,000,000, should be found by the Imperial Treasury. Finally, at the beginning of October. the Treasury gave formal sanction to expenditure by the Imperial Munitions Board at the rate of $30,000,000 a month up to the end of 1917, of which sum they would provide $5,000,000 monthly from American credits.[2]

(*f*) Reduction of the Canadian Munitions Programme.

While the above negotiations were proceeding, plans were being made to bring the Board's expenditure within its income. From June, 1917, it became increasingly evident that the united efforts of the two Governments would not be sufficient to finance the existing programme in Canada. It remained, therefore, for the Ministry to reduce its orders so as to bring them within the amount which would in future be at the disposal of the Imperial Munitions Board.

The ammunition programme which the Board was in the summer of 1917 carrying out for the Ministry of Munitions involved an approximate monthly expenditure of $40,000,000.[3] In addition, payments made by the Board for high explosives and propellants, for zinc and other metals, together with payments made on behalf of the Air Board, amounted to a further $10,000,000 a month. The cost of building wooden ships was at the moment covered by the Finance Minister's special advance, but the cost of steel shipbuilding was estimated at $2,000,000 for July, and was likely to be increased in the near future if construction were accelerated. Repayment of temporary bank advances, and of interest which might be outstanding on the Canadian Government or bankers' loans, was not included in these estimates.

The position, in brief, was that an expenditure of upwards of $50,000,000[4] (out of which at least $10,000,000 was earmarked for commitments of the Board other than munitions) had to be reduced to meet an expenditure only guaranteed up to $30,000,000. A cut of from 40 to 50 per cent. at least on existing munition orders was involved.

The Chancellor of the Exchequer had already initiated the policy of reduction in a letter written to Dr. Addison, at the close of May, asking him to arrange that, until the financial position was clearer, no fresh contracts or continuation contracts should be made either in the

---

[1] B.C. 549. [2] B.C. 555, 563; M. 2993.

[3] The Ministry was on the eve of submitting for Treasury sanction an increased Canadian programme for ammunition which involved an extra weekly outlay of about $3,000,000. This, of course, had to be given up. (M.C. 212).

[4] At a conference held on 27 June, when Sir Laming Worthington Evans, Mr. Hanson, Mr. Dannreuther, Mr. Layton and Mr. Corrie were present, it was decided that the general trend of Canadian expenditure pointed to $53,000,000 as the monthly sum required for the remainder of the year.

United States or Canada. This letter was circulated to all departments of the Ministry. In the same way the Canadian Finance Minister was officially informed by Sir Hardman Lever that it was considered necessary to reduce expenditure in Canada through the Imperial Munitions Board without any delay.[1]

It was obvious that the required reduction of programme could not be accomplished at a moment's notice save by a serious dislocation of industry in Canada and the risk of failure in discharging the Ministry's responsibilities to the War Office. Generally speaking, however, if shell orders were not continued beyond 30 September, subsequent commitments would be confined to the raw material orders or such balance as could not be cancelled.[2] A practicable date, therefore, from which to arrange a reduced scale was 1 October.

After lengthy discussions, from 10 July onwards, a reduced programme was adopted[3] which would ultimately reduce the Ministry's expenditure on shell and components in Canada from approximately $40,000,000 to approximately $19,500,000 per month.[4]

(g) The Transition Period, September to December, 1917.

The new reduced programme was not to come into full effect until about March or April, 1918, but as early as August there had been an appreciable drop to $40,000,000 in the Board's monthly estimates, which were calculated not to exceed an average of $32,000,000 for the remainder of 1917. Against this had to be reckoned the fact that the combined guarantee of the Imperial Treasury and the Canadian Government was only $30,000,000. Nor did the Board start with a clean slate, for $10,000,000, forestalled by the Board in July, was still owing to the Canadian Minister of Finance, and overdrafts of $5,000,000 at the banks had to be met. Between September and December, 1917, however, by dint of using up stocks of raw material on hand, by deferring certain shipbuilding payments, and by certain incidental economies, the Board were able to effect such economies as, combined with the continually diminishing programme, placed them on a sound financial footing, and from October, 1917, onwards, the Board never drew the full amount of its credit with the Canadian Minister of Finance.[5]

The estimated expenditure for the four months September to December, 1917 (which had now been reduced to $121,200,000), not only left no margin for contingencies, but was slightly in excess of income. The Treasury were obliged to refuse (27 November) a request by the Ministry of Munitions that a further credit of $3,000,000 a month should be made to the Board to provide a margin of safety, but stated that they had arranged to provide an additional monthly sum of $1,900,000 for the expansion of the shipbuilding and aviation programmes, to take effect in 1918.[6]

So far from increasing the funds for munitions purposes, there was indeed at this date serious risk of a further reduction of the Board's "dollar ration." On 19 November the British American Board,

[1] M.C. 198; B. 3409. [2] B. 3575. [3] See above, p. 39.
[4] See Appendix III. [5] M. 3504, 3666; B. 5138, 5395. [6] M. 3332; B. 4836.

considering the question of supplies from Canada, had, on the representations of Mr. Wintour, decided that the necessities of the Ministry of Food were paramount and should be met even at the expense of the Canadian munitions programme. The Treasury's total commitments in Canada (including munitions) were $48,000,000 a month, their available resources (provided from the Finance Minister's $25,000,000 and $15,000,000 from the United States) amounted to $40,000,000, and it was now proposed to make income and expenditure tally by withdrawing $8,000,000 from the Board's funds. This plan, to which the Ministry was strongly opposed, was eventually withdrawn on account of the representations made by Lord Reading that such action would not be in accordance with the understanding with Sir Thomas White, and funds for bacon and meat purchases were supplied by the United States Government.[1]

In November, the Board drew on Sir Thomas White for $16,000,000 only of his credit. At the close of the month they reported that their arrears consisted of $3,340,000 overdraft at the banks while suspended payments to contractors were about $14,000,000.[2] In December another $5,000,000 on Sir Thomas White's monthly loan was not spent, so that the Imperial Munitions Board began 1918 with a balance of $14,000,000 to their credit.

V. The Surplus Credits of 1918.

(*a*) Disposal of Surplus Funds.

By the end of January, 1918, the Board had $20,000,000 unexpended from Sir Thomas White's monthly credit and, as it would be increasingly difficult to establish a claim dating as far back as November, 1917, the question arose as to its disposal. The Ministry's position as to this balance was that the agreement to allot $30,000,000 monthly for the Board's expenditure was definitely binding and could not be varied by the Treasury at will, even when there was a known saving.[3]

During this period of surplus funds the Board exercised their judgment by acquiring reserves against future contingencies. They increased their stocks of material, particularly steel, as far as possible. They kept all accounts closely paid.[4] From the savings on their commitments they also undertook, between January and April, 1918, certain miscellaneous payments and orders, including the purchase of calcium carbide ($406,000) and sulphite pulp ($16,480), the payment of $85,389 to the Canadian Car Company on the Russian car order and the total commitments for white pine for the Air Board up to June, 1918. In the same way they diverted to Canada an order for the purchase of leather to the value of $4,000,000 which would otherwise have gone to the United States.[5] Furthermore, Sir Joseph Flavelle, acting in consultation with Mr. Maclean (at this time serving as Finance Minister in the absence of Sir Thomas White) and Sir Hardman Lever, released in March $5,000,000 of the Board's credit towards the purchase of food stuffs in Canada.

---

[1] M.C. 265. [2] B. 4976. [3] M.C. 272, 277.
[4] B.C. 809. [5] M. 3521, 5175, 2592; B. 6125, 4317.

The surplus credits were not exhausted by this additional outlay; indeed, as the expenditure of the Board diminished (in conformity with the reduced munitions programme) they continued to accumulate. At the close of April there was an undrawn balance of $32,000,000, which during May and June rose to $33,600,000. Of this sum $16,000,000 could not be regarded as actual saving, but was earmarked, with the consent of Sir Thomas White, as deferred payment for ships delayed in delivery, and carried forward to the period July–December, 1918.[1] Sir Thomas White's consent was also obtained for the release of a further $10,000,000 to Sir Hardman Lever for food stuffs. The net balance of unexpended credit on 30 June, 1918, was therefore $7,600,000.[2]

(*b*) Financial Programme for July to December, 1918.

In May the Minister of Finance agreed to continue his subsidy from July to December, 1918, so that the Board's income remained as heretofore $30,000,000. The commitments of the Board were estimated as follows:—[3]

Month.	Ministry of Munitions.*	Ministry of Shipping.	Air Ministry.	Timber Controller.	Total for Month.
	$	$	$	$	$
July	20,469,000	4,313,000	1,096,000	198,000	26,076,000
August	20,020,000	4,757,000	1,263,000	21,000	27,061,000
September ..	23,100,000	4,500,000	1,250,000	1,000,000	29,850,000
October	23,600,000	3,700,000	700,000	1,000,000	29,000,000
November ..	24,300,000	3,350,000	700,000	1,000,000	29,350,000
December.. ..	24,800,000	1,700,000	700,000	1,000,000	28,200,000

* Under munitions, which included high explosives and propellants, various miscellaneous payments recoverable from other Departments (*e.g.*, for asbestos for the Admiralty, pulpboard for the War Office), local expenditure on aircraft production, and payment for Russian railway materials were comprised.

These estimates proved to be also in excess of expenditure. The actual expenditure in July and August was just over $44,000,000 for the two months, exclusive of shipping which was charged against the special reserve of $16,000,000. The revised expenditure for September was $23,000,000, so that at the end of the month the question once more arose as to the disposal of surplus funds, which had now reached about $23,000,000. Accordingly, by arrangements with Sir Thomas White and Sir Hardman Lever, $6,800,000 were transferred to the latter for wheat purchases in October.[4] Negotiations for the 1919 programme were under active consideration when the Armistice was signed.

[1] B. 6312, 6983; M. 6487.
[2] M. 4747, 6487; B. 6983.
[3] M. 5181; B. 7879.
[4] B. 8193, 8295; M. 5360.

APPENDICES.

APPENDIX I.

(CHAPTER II, p. 19.)

I. Royal Commission on certain Contracts made by the Shell Committee.

The adverse criticism of the Shell Committee by no means disappeared with its supersession by the Imperial Munitions Board, and at the beginning of 1916 took the form of demands for a Parliamentary enquiry into its work. The Imperial authorities considered that nothing was to be gained at the moment by an investigation which could only serve to hinder the work of the new Board, and so informed the Canadian Government.

On 7 March, 1916, accordingly, Sir Wilfrid Laurier's motion for the appointment of a Parliamentary Committee to enquire into alleged malpractices by the Committee in awarding contracts both in Canada and the United States was refused by Sir Robert Borden, on the ground that the Committee were acting for the Imperial Government, and the funds involved were Imperial and not purely Canadian. Public feeling, however, ran very high, and on 28 March for the first time definite charges in connection with certain contracts were made, and the demand for a Parliamentary enquiry reiterated. These charges, which made a tremendous sensation, were directed against "Honorary Colonel" Wesley Allison,[1] who had acted as agent of the contracts, and, through him, against the Minister of Militia. The contracts concerned were (1) a contract for fuses bearing the date 19 June, 1915, with the International Arms and Fuse Company; (2) a second contract for fuses of the same date with the American Ammunition Company; (3) a contract of 16 July, 1915, with the Edwards Valve Company, of Chicago, for cartridge cases; (4) a contract with the Providence Chemical Company, of St. Louis, for picric acid.

It was now impossible to ignore the matter, and the Prime Minister decided on the appointment of a Royal Commission. The Opposition declared that the only satisfactory method was to hold a Parliamentary enquiry, and Sir Wilfrid Laurier's original motion was again debated on but defeated, on 4 April, by 82 to 44.

The Royal Commission held its first session on 19 April, and the taking of evidence and the arguments of counsel occupied twenty-nine days. The nature of the charges against the Shell Committee may be summed up under the following heads :—

(1) A general accusation that Canada had not received sufficiently preferential treatment in the placing of contracts.

(2) An indictment of the companies to which the fuse contracts had been given, stating that they were of "mushroom" growth, and both financially and commercially unsound.

(3) That excessive prices had been paid.

(4) That contracts had been awarded for which commissions had been received. Side by side with this accusation was the insinuation that General Hughes had purposely intervened in the work of the Shell Committee, with the view to influence the awarding of contracts.

The findings of the Commission under these heads were as follows :—

(1) The general accusation as to neglect of Canadian manufacturers was itself limited, for the purposes of the Commission, to an investigation of the circumstances under which the order for 5,000,000 fuses was placed in the States. The Commission here found that the Committee acted in good faith, and were

---

[1] Colonel Allison was a personal friend of General Hughes. The latter had implicit trust in him and had indeed, on 21 September, 1914, cabled a suggestion to Lord Kitchener that a Purchasing Committee for the British Government in Canada and the United States should be formed, consisting of himself, Colonel Allison and General Grain. (94/S./100). The proposition was not taken up by the War Office.

not fairly open to adverse criticism. Down to the latter part of May they had not given up the idea that the time fuse might be manufactured in Canada, if not by Canadian manufacturers, at least by the American companies establishing their plant in Canada. As a council of perfection, however, the Commission considered that when the Committee's expert adviser discovered that one-third of the 5,000,000 fuse order was for graze fuses, which undoubtedly could have been made in Canada within the required time, he should have withdrawn from the American companies and opened up fresh negotiations with Canadian manufacturers.

(2) The Commission did not consider that the charges of financial instability against the International Arms and Fuse Company and the American Ammunition Company were proven. It was true the former was a new organisation, created for the purpose of entering into and implementing the contract subsequently made with it, but it was brought into existence by business men of high standing and large means who had arranged, as was often done in America, to embark on manufacture as a joint adventure. The nominal capital of the company was small, but behind it was the credit and experience of these men. In the same way Mr. Cadwell, who controlled the American Ammunition Company for himself and his associates, had command of sufficient capital to provide all the financial resources needed to carry out the company's contract. In no invidious sense, therefore, could either of these companies be called mushroom.

(3) As regarded the question of excessive prices paid for fuses, the Commission considered that the testimony of Mr. Charles B. Gordon, Vice-Chairman of the Imperial Munitions Board, established beyond doubt that $4.50 was, in the spring of 1915, a reasonable price for time fuses. The prices paid for graze fuses was, however, open to serious censure. It was fixed at $4 by Colonel Carnegie, and was based partly on a tentative estimate from the Northern Electric Company, who had not seen a sample, and upon a drawing and sample furnished by Mr. Cadwell without a specification. A fair price for graze fuses at that time was $3, and Colonel Carnegie, while there was no question of his general integrity, exposed himself to criticism in failing to check his judgment by available information as to price, more especially as Mr. Cadwell, to whose firm the contract was given, was already under contract in the United States with the British War Office for the same fuse.

(4) The Commission considered that it was established beyond a doubt that in no case had General Hughes or the Shell Committee received any commission, nor been unduly influenced in placing contracts. They were severe in their strictures on Colonel Allison, who had in two instances received commissions or promise of commission, on both occasions without the knowledge of General Hughes, General Bertram, or Colonel Carnegie. In the case of the American Ammunition Company Group, which he had introduced to the Shell Committee, he had an agreement with Mr. Yoakum, one of the company's promoters, entitling him to share equally any benefit Mr. Yoakum might receive, either by way of commission or otherwise. He had also obtained from Mr. Yoakum the promise of a commission in connection with the Edward Valve Company's contract for cartridge cases which Mr. Yoakum, on his introduction, had negotiated with the Shell Committee. The Commission strongly condemned the conduct of Colonel Allison, who had professed to be acting solely out of friendship for General Hughes without any intention of receiving any remuneration for his services. They considered that his conduct in accepting commissions without informing General Hughes and the Shell Committee, and obtaining their consent, could be neither justified nor excused.

The charges in connection with an alleged contract with the Providence Chemical Company of St. Louis, for picric could not be investigated, for the simple reason that no such contract or purchase had ever been made.

APPENDIX II.

(Chapters III and IV).

Supplies of Munitions and Materials from Canada, 1915–1918.[1]

	1915.	1916.	1917.	1918.	Total.
		Figures represent Numbers			
Shell—					
13-pdr. S., Empty Shell	—	79,550	—	—	79,550
15-pdr. S., Empty Shell	113,552	177,552	8,154	—	299,258
18-pdr. S., Complete Rounds	—	3,135,864	11,051,571	2,329,211	16,516,646
18-pdr. Fixed Rounds[3]	979,311	5,473,528	1,970,313	—	8,423,152
18-pdr. Empty Shell	3,206,515[2]	1,659,777	—	3,798,627	8,664,919
18-pdr. H.E., Fixed Rounds[3]	827,140	3,321,008	29,568	—	4,177,716
18-pdr. H.E. Empty Shell	2,118	227,674	1,137,458	84,445	1,451,695
Total Light Shell	5,128,636	14,074,953	14,197,064	6,212,283	39,612,936
4·5-in. H.E., Empty Shell	253,827	4,185,014	5,165,653	2,966,850	12,571,344
60-pdr. H.E., Empty Shell	720	590,744	510,369	2,443	1,104,276
Total Medium Shell	254,547	4,775,758	5,676,022	2,969,293	13,675,620
6-in. H.E., Empty Shell	—	710,103	2,927,670	6,881,446	10,519,219
Total Heavy Shell	—	710,103	2,927,670	6,881,446	10,519,219
8-in. H.E., Empty Shell	—	173,071	506,535	73,911	753,517
9·2-in. H.E., Empty Shell	—	111,149	478,915	192,291	782,355
Total Very Heavy Shell	—	284,220	985,450	266,202	1,535,872
Totals:—					
Complete Rounds	—	3,135,864	11,051,571	2,329,211	16,516,646
Fixed Rounds[3]	1,806,451	8,794,536	1,999,881	—	12,600,868
Empty Shell	3,576,732	4,914,634	10,734,754	14,000,013	36,226,133
Grand Total Shell	5,383,183	19,845,034	23,786,206	16,329,224	65,343,647
Shell Forgings—					
18-pdr. S.	—	447,182	—	—	447,182
4·5-in. H.E.	592,822	568,245	2,740,480	170,693	4,072,240
60-pdr. H.E.	—	5,750	—	—	5,750
6-in. H.E.	—	—	1,057,268	717,762	1,775,030
8-in. H.E.	—	—	17,880	39,834	57,714
9·2-in. H.E.	—	—	7,236	36,760	43,996
Total Forgings	592,822	1,021,177	3,822,864	965,049	6,401,912
Shell Components[4]—					
Fuses	7,000	2,326,786	7,613,552	3,175,242	13,122,580
Cartridge Cases	322,997	8,078,568	8,013,161	2,059,889	18,474,615
Primers	1,000,000	2,713,500	2,031,344	542,130	6,286,974
Total Components	1,329,997	13,118,854	17,658,057	5,777,261	37,884,169
Aero-Engines[5]	—	—	—	125	125
Mechanical Transport Vehicles[6]—					
Ford Cars	—	—	—	12	12
Tractors	—	—	7	—	7
Total Vehicles	—	—	7	12	19

[1] The figures represent shipments made by the Imperial Munitions Board, but do not include supplies for the Ministry of Shipping.

[2] Includes 3,294 delivered in 1914.

[3] *i.e.*, without fuses, but with cartridge cases and primers.

[4] Exclusive of those supplied with complete and fixed rounds. Minor components to the value of nearly $10,000,000 were also supplied.

[5] Spare parts for aeroplanes and aero-engines, amounting in value to $110,000, were also supplied.

[6] Spare parts were also supplied, to the value of $23,000.

Appendix II—*contd.*

	1915.	1916.	1917.	1918.	Total.
		Figures repr	*esent Tons.*		
Steel, Ferro-Silicon and Ferro-Molybdenum	—	3,260	15,255	4,500	23,015
Non-Ferrous Metals[1]	—	1,495	8,479	14,986	24,960
		Figures repr	*esent Short To*	*ns.*	
High Explosives (T.N.T.) ..	800	9,250	10,827	—	20,877
Propellants—					
Sent with 18-pdr. Rounds ..	1,355	8,948	9,788	1,751	21,842
Sent Separately	—	3,308	5,524	15,206	24,038
Total Propellants ..	1,355	12,256	15,312	16,957	45,880
Explosive Materials	137	85	2,408	8,600	11,230
		Figures repr	*esent Dollars.*		
Summary of Expenditure [2]—					
Shell, Forgings & Components	55,325,108	272,559,087	360,302,157	225,291,134	913,477,486
Steel, etc.	—	300,296	1,304,939	1,048,534	2,653,769
Non-Ferrous Metals ..	—	502,083	3,113,301	2,949,290	6,564,674
High Explosives	1,600,000	17,215,500	12,866,040	—	31,681,540
Propellants [3]	—	5,359,493	6,720,511	18,159,242	30,239,246
Explosives Materials ..	68,720	47,489	1,271,832	3,926,274	5,314,315
Aircraft Supplies	—	—	23,100	672,847	695,947
Aeroplane Lumber	—	—	—	4,013,480	4,013,480
General Timber [4]	—	—	—	2,344,469	2,344,469
Mechanical Transport ..	—	—	14,300	28,716	43,016
Railway Materials	—	—	—	2,779,683	2,779,683
Miscellaneous	—	179,495	1,562,782	2,280,573	4,022,850
Total Expenditure ..	56,993,828	296,163,443	387,178,962	263,494,242	1,003,830,475

[1] Include antimony ore, arsenic metal, powdered aluminium, calcium carbide, nickel and zinc.

[2] The figures include expenditure on certain items (minor components, spare parts, timber, railway materials and miscellaneous supplies) the output of which is not given above. In these cases the quantities supplied are most conveniently indicated by their value in money.

[3] The expenditure on propellant supplied with 18-pdr. rounds is included in the figures for shell.

[4] Supplied to the Timber Controller, Board of Trade.

APPENDIX III.

(CHAPTER IV, p. 39.)

Table showing the Reduction effected by the Change in the Shell Programme, 1917.[1]

Nature of Shell.	Programme as authorised in June, 1917.		Programme as reduced from October, 1917.	
	Quantity per week.	Cost.	Quantity per week.	Cost.
		$		$
18-pdr. S. complete rounds ..	350,000	4,375,000	175,000	2,187,500[2]
H.E. empty shell ..	50,000	195,000	—	—
4·5-in. H.E. ,, ,, ..	145,000	1,196,250	100,000	825,000
60-pdr. H.E. ,, ,, ..	15,000	168,000	—	—
6-in. H.E. ,, ,, ..	70,000	1,239,000	140,000	2,478,000
8-in. H.E. ,, ,, ..	20,000	840,000	—	—
9·2-in. H.E. ,, ,, ..	20,000	1,270,000	—	—
4·5-in. cartridge cases	85,000	141,000	85,000	141,000
18-pdr. ,, ,, ...	100,000	170,000	100,000	170,000[3]
Graze fuses	250,000	333,300	—	—
4·5-in. forgings	90,000	301,500	90,000	301,000
6-in. ,, ...	40,000	360,000	40,000	360,000
Exploder containers and rings ..	250,000	92,500	250,000	92,500
Gaines	84,000	25,200	84,000	25,200
Total ..	—	10,706,750	—	6,580,200

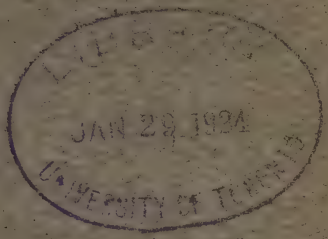
[1] Compiled from M. 2840 and memoranda filed in R.I.M.B./Gen./206.

[2] After 1 January, 1918, changed over to 120,000 18-pdr. shrapnel, finished shells only with socket tubes, disc cup loaded with lead bullets.

[3] Production to end on 31 December.

A

HISTORY OF THE MINISTRY OF MUNITIONS.



VOLUME II

GENERAL ADMINISTRATION

PART V

INDIA

Volume II

GENERAL ADMINISTRATION

PART V

INDIA

CONTENTS.

India.

PART V.

INDIA.

I. The Indian Ordnance Factories.

(*a*) Capacity and Normal Output.

The manufacture of munitions in India, as it existed before the war, was intended solely to meet the needs of the Indian army, whose primary function was the maintenance of order within and on the borders of British India. The pre-war army in India was in no sense maintained with a view to meeting external obligations of an Imperial nature ; and the scope of the organisation for supplying munitions to the army was correspondingly limited. This organisation may briefly be described as follows.

The Ordnance Department, a branch of the Military Department of the Government of India, was controlled by a Director General of Ordnance, under whom were Directors of Ordnance Factories, Ordnance Stores, and Ordnance Inspection. The seven Ordnance Factories, practically the sole source of supply, were by no means self-contained, and relied on England for most of their materials, as well as for items such as heavy guns and machine guns which they could not undertake. Supplies were stored in arsenals, under the control of the Director of Stores, and these arsenals were also capable, on a very small scale, of repair work and minor manufacture.[1] Interchangeability of pattern was maintained as far as possible between Indian and home manufacture, and the Director of Inspection received weekly notice from England of changes of specification.[2]

Field and mountain guns and shell up to 7·5 in. were made at Ishapore and Cossipore Gun and Shell Factories, close to Calcutta. These two factories, though some miles apart, were interdependent, and under the same management. Generally speaking, Ishapore, which could produce monthly from 1,200/1,500 tons of acid open hearth steel,[3] supplied the metal required by both factories, and did forging, while most of the machining was done at Cossipore. Ishapore, however, did some machining of shell, and made cartridge cases. Between them the two factories could turn out weekly about 6,000 shell and 13,000 fuses[4] ; but their normal output was considerably below this, and during the year 1913/14[5] only 24,000 shell and 60,000 fuses were produced. The shell machines were for the most part old

[1] Hist. Rec./R/1143/11. [2] C.R./2705.

[3] Hæmatite pig iron was supplied from England.

[4] Hist. Rec./R/1143/1. C.R./D.G.S.G./2257.

[5] Hist. Rec./R/1143/2.

and unsatisfactory; one lathe dated back to 1846. Gun-making at Cossipore was limited by the repair work necessary, and was further complicated by the large number of different types in use. Forgings were for the most part supplied from England, though Ishapore produced a few.[1] Gun carriages and mountings were made at a special factory at Jubbulpore.

Kirkee, near Poona, filled shell with lyddite and 18-pdr. cartridge cases with cordite, and also filled small arms ammunition, the cups for which were made at Ishapore. 18-pdr. shrapnel was filled and assembled at Kirkee. Fuses were filled at Dum Dum, near Calcutta, but, owing to the dampness of the atmosphere, during half the year only. The full filling capacity was 2,000 fuses a day, as well as a certain quantity of H.E. shell and small arms ammunition.

Cordite was produced at Aruvankadu, in the Nilgiri Hills, but the acetone and glycerine used were imported. The limit of output was 1,200 tons a year.[2] Picric acid and other explosives materials were chiefly obtained from England.

Rifles and bayonets were made at Ishapore Rifle Factory, which was quite distinct from the Gun and Shell Factory. The full capacity was 25,000 a year; but during the year 1913/14 the output was under 9,000.[3] This factory also undertook repairs to machine guns.

The seventh factory, the Harness and Saddlery Factory at Cawnpore, was to a great extent self-contained, since all the leather used was tanned in India. Buckles and some other items were, however, obtained from England.[4]

(*b*) Output During the War.

The output of the Ordnance Factories, being normally far below capacity, was increased very rapidly on the outbreak of war. Some slight additions to machinery were necessary, and shortage of skilled labour was a serious difficulty which could only be overcome by training; but the progress made is shown by the fact that during the six months, October, 1914, to March, 1915, the output of small arms ammunition was double that of the previous six months, while shrapnel shell increased four fold, and other items showed a similar or greater increase. The importation of materials was a constant source of anxiety, and before long necessitated decreased production of small arms ammunition; while the Cordite Factory would have been in serious difficulties had not an acetone recovery plant been installed.[5]

---

[1] Nothing larger than tubes for 18-pdrs. could be turned out at Ishapore; but the jackets could be made by Jamalpur Railway Shop.

[2] Hist. Rec./R/1143/1. C.R./D.G.S.G./2257.

[3] Hist. Rec./R/1143/2.

[4] Hist. Rec./R/1143/11.

[5] M.W./47765. An extension of the Cordite Factory was suggested in 1915, but was considered impracticable in view of the difficulties of obtaining raw materials and plant from England and of training native labour in a skilled industry as well as of the restricted water-supply in the hills, where alone cordite manufacture was possible. (Hist. Rec./H/1530/2.)

Throughout the war the policy was followed of supplementing the output of the Ordnance Factories, wherever possible, by enlisting the assistance of private firms. At first such outside manufacture had to be confined to the neighbourhood of the Ordnance Factories, but from the beginning of 1916 onwards it was systematically extended. The Ordnance Department supplied drawings, patterns and specifications; instructions to guide manufacture were drawn up, and as far as possible tuition was given in methods of manufacture. In many cases the Ordnance Factories had to make and supply jigs, special tools and fittings, and provide the raw materials.

The total output[1] of some of the more important items from the Ordnance Factories, or other establishments under the supervision of the Director of Ordnance Factories, between August, 1914, and October, 1918, was as follows:—

Guns (all natures)	176
Gun Carriages	156
Shell (all natures)	1,361,000
Fuses (filled)	1,274,000
Rifles (new and converted)	145,758
Small Arms Ammunition	583,000,000
Cordite (all descriptions)	3,603 tons
Steel	64,600 tons

As regards the use to which this output was put, the Indian Ordnance Department equipped the Indian troops which went to France, though their maintenance devolved to a large extent on the War Office. They also undertook to meet as far as possible requirements for Force "D," and from the end of 1915 demands from Mesopotamia heavily taxed India's resources. The arrangement finally come to was that all demands for Mesopotamia should in the first place be made on India, and those which could not be met there transferred to the War Office.

India was able also to send some surplus supplies home, especially during the first year of the war.[2] A consignment of 7,000 empty 4·5 in. H.E. shell was despatched in December, 1914; 2,500 6 in. howitzer H.E. were sent in April, 1915, and 1,500 6 in. H.E. in May. For some time in 1915 monthly consignments of about 45,000 18-pdr. and 7,000 13-pdr. complete rounds were sent; while from February to the end of the year 40/50,000 lbs. of cordite were also sent each month. Fifty thousand rifles were sent with the troops which came to Europe in 1914 and an additional 40,000, of old pattern, were sent as being beyond the power of India to repair. Rifle components, made at Ishapore, were also sent home. By May, 1915, monthly consignments of 500,000 rounds of small arms ammunition were being sent to England, and large quantities were also sent to South Africa.

[1] Memorandum on *India's Contribution to the War in Men, Materials and Money*. (Copy in Hist. Rec./R/1143/16.)

[2] India Office File S/16332/1915. (Copy in Hist. Rec./R/1143/8.)

Consignments for England were less frequent after 1915, owing to the pressure of Mesopotamian demands. In January, 1917, 1,100 empty 6 in. gun shell were despatched,[1] and guns were sent from time to time, over 250 of various calibre having been provided by India by March, 1917, exclusive of those sent to Mesopotamia. Cordite supplies continued and empty fuses were sent home in the rainy season when they could not be filled in India, the total number sent being about 432,000.

(c) Extensions of the Ordnance Factories.

During the last two years of the war considerable extensions were in progress at certain of the Ordnance Factories. These extensions were undertaken as the result of recommendations made by Sir Frederick Black, who visited India early in 1917. Sir Frederick Black's original scheme was for increasing the shell output of the factories by extensions which could, if necessary, be undertaken in three stages, the first of which would provide 20,000 18-pdr. and 5,000 4·5 in. (or larger) shell a week, in addition to the existing output of 6,000 a week of 18-pdr. or smaller shell and 300 of 4·5 in. or larger.

In accordance with this first stage of the "Black Scheme,"[2] which was the only part of the programme on which agreement was reached, Ishapore Factory was enlarged to allow of an increased output of shrapnel shell, and Cossipore for H.E. shell, while considerable constructional work was undertaken at Kirkee, in order that the H.E. shell might be filled in India.

A considerable period elapsed between the promulgation of the scheme and its sanction by the India Office and the Indian authorities, and no constructional work was begun until 1918. Many unexpected difficulties were then experienced, and progress was slow; so that by the middle of 1918 it was clear that no increase of production could be expected from the factories until the end of the year, and that the maximum output contemplated could not be reached until the middle of 1919.

At the time of the Armistice, therefore, although the buildings at Cossipore and Ishapore were practically complete and those at Kirkee well advanced, no output had been obtained from the extensions. As, however, the expenditure already incurred had been heavy, and it was not thought that any considerable saving could be effected by abandoning the scheme at the stage it had reached, it was decided that the extensions should be completed, in the interests of the Empire and as a war insurance.

---

[1] D.M.R.S./631.

[2] A fuller account of the Black Scheme is given in the Appendix.

II. The Manufacture of Shell under the Munitions Branch of the Railway Board.

(*a*) Suggestions for the Utilisation of Indian Capacity, May and June, 1915.

Early in May, 1915, a question as to the organisation of Indian industry for munitions production was asked in the House of Commons, and received the reply that no special measures had been found necessary. A few days before this, however, the Munitions of War Committee had received from Messrs Burn and Company, an important engineering firm near Calcutta, an offer to supply bridges, rolling stock, steamers, etc., for use in the Persian Gulf and East Africa. This proposal opened up possibilities that the Ordnance Factories might not be the only Indian source of supply, and the Viceroy was asked for an immediate report on Messrs. Burn's capabilities. This, while confirming the firm's ability for engineering work of all kinds, definitely discouraged any attempt to organise private resources. "As regards ordnance stores," the telegram said, "Messrs. Burn are not in a position to assist. Generally speaking, private establishments in India cannot help much in manufacturing articles of ordnance equipment except tents. Our inspection staff is not large enough to undertake inspection of manufacture of private firms, nor is it possible to expand it."[1]

The question was, nevertheless, pursued, and at the end of May the India Office views were asked on a suggestion of Lord Curzon's that the output of the Tata Iron and Steel Company, who had large works near Calcutta, might be commandeered, and surplus lathes in Indian mills used to make shell cases, which could be filled in England.[2] Colonel Campbell, the Ordnance Consulting Officer to the India Office, was of opinion that the simplified designs then being issued ought to enable any good engineering firm to make shell, and that Indian railway shops and private firms, if suitably organised, could turn out large quantities of the new types of H.E. shell for field guns and the 4·5 in. howitzer. Messrs. Tata should be able to provide steel, but the supply of copper bands might prove a difficulty.

A draft telegram, indicating to the Government of India the lines on which shell manufacture might be organised, was drawn up by the India Office, and sent to Lord Curzon on 9 June, for "the consideration of the Munitions Committee." It was discussed and approved by Dr. Addison, Mr. Booth and Lord Curzon, and despatched on 14 June. It ran as follows[3]:—

> "Munitions Department suggest that Indian railway workshops and private shops, if organised for the purpose, could

[1] India Office File S/16332/1915.

[2] Lord Curzon also suggested that Bengali turners should be brought over to England and that the Indian Cordite Factory should be utilised for European supplies. The first was considered impossible; the second was already being done.

[3] India Office File S/16332/1915.

manufacture large quantities of H.E. common shells for lighter field guns (proper) and 4·5 in. howitzers. Latest shell designs and specifications now under supply to your department are within manufacturing powers of any good workshop, given steel of proper quality, other materials, and suitable machinery. It is thought Tata steel works could supply suitable steel blanks rolled and cut in any quantity after few weeks of preparation. Blanks after inspection might be finished in railway or other large workshops, the copper tubing for the ring driving bands being made in steel presses at Cossipore or elsewhere. Any shell factories thus established will need close guidance by Ordnance Department, and owners and managers should undergo course of industrial overlooking at Cossipore before adapting their presses and machines for the work. Present Inspection Department would have to be enlarged. India should, if possible, not only complete shells but fill them with lyddite. If this is not possible they would be filled here. Please give matter immediate earnest attention. Conference between ordnance officers and owners and managers might be useful. Papers follow."[1]

On 18 June the Viceroy replied: "The matter is engaging our attention, and we have been and are taking all preliminary actions. As soon as possible after receiving designs, specifications and papers referred to in your telegram, the extent to which we can assist War Office will be telegraphed to you." This telegram conveyed no information as to the extent of India's powers and the stage to which shell manufacture could be carried, but the India Office authorities had by this time reached the conclusion that filling in India was impracticable, since explosives materials were not available. Sir Thomas Holderness, in writing to Sir Hubert Llewellyn Smith on 19 June, summed up the India Office views: "It now seems clear that India cannot go further than making unfilled shells, and whether it can go thus far or not will depend on whether the War Office can supply it with brass and copper tubing for the driving bands. If the brass and copper tubing cannot be supplied, it looks as though India cannot be of help in shell-making."[2]

(*b*) Formation and Early Activities of the Munitions Branch.

By this time little doubt was felt in India that shell could be produced, and preliminary steps had been taken before a decision was reached in England. The desire to share in armament work had, during the first fortnight of June, been seen to be widely spread. For instance, the Tata Iron and Steel Company had asked, both in India and through their London agents, to be taken over as a permanent State factory, and on 10 June had offered to place their works and stocks of material at the disposal of the Government of India for

[1] Specifications, a note by Col. Campbell, etc., had been despatched to the Army Department on 9 June.

[2] M.W./9605/2.

munitions work.[1] The Calcutta branch of the Institution of Mechanical Engineers, at their annual meeting on 11 June, had passed a resolution empowering their Committee "to investigate the possibilities of utilising the resources of the engineering concerns in Bengal for the manufacture of munitions . . . and if found practicable to represent the case to the proper authorities."[2]

Moreover, Indian railway officers, whose shops were by far the most important of Indian engineering concerns, had for some time been convinced that they could produce shell, and informal discussions had taken place between the Railway Board and the Army Department. The telegram of 14 June did not, therefore, raise the question of shell production; but it did assure manufacturers that their output would be welcome, at the same time suggesting the form which output should take.

The Government of India decided to entrust the mobilisation of private resources to the Railway Board, who, on 22 June, proposed the creation of a Munitions Branch under a Superintendent directly responsible to the Board. This suggestion was approved, and Mr. Victor Bayley, Assistant Secretary to the Railway Board, was appointed Superintendent of Munitions, with an office at Simla; a branch office at Calcutta was to be controlled by a Deputy Superintendent of Munitions.[3]

On 25 June, at Calcutta, 17 railway engineers met to confer with Mr. Bayley, Colonel Minchin, Director of Ordnance Inspection, and the Director of Ordnance Factories. All the railway officers were sure of their ability to produce shell to the limits of accuracy explained by Colonel Minchin, and the conference was of short duration. On the following day a deputation visited the Gun and Shell Factories, and arranged for parties of foremen and works managers to receive some instruction in shell manufacture.

Meetings of the Indian Engineering Association and the Jute Mills Association, attended by Mr. Bayley, resulted in the enlistment of the principal Calcutta firms; the plant in jute mills was inspected with a view to the equipment of a special shell factory; and on 1 July the Calcutta branch of the Institution of Mechanical Engineers was asked to prepare a census of available machinery.

By the end of the first week in July the railway engineers had returned to their various headquarters and Mr. Bayley to Simla; the offices of the Munitions Branch had been opened; and the organisation of the country as a whole could begin. The Munitions Branch decided

---

[1] In November, 1915, the firm again approached the India Office and asked for financial assistance to enable them to enlarge their works. The proposal was discouraged on the ground that interference with Government of India arrangements must be avoided (India Office File S/16332/1915).

[2] D.D.G. (A) 11169.

[3] There was no branch office at Bombay, but the Bombay Government subsequently appointed a Munitions Committee, which assisted the Munitions Branch in the co-ordination and distribution of work and assessment of cost. (*The Manufacture of H.E. Shell in India.* Copy in Hist. Rec./R/1143/1.)

to centralise shell manufacture in a few factories, and to replenish their plant by machines collected from other sources. The results of the Calcutta census of machinery justified the establishment of two new factories, and the Albion Foundry, with its equipment, was at once handed over by the British India Steam Navigation Company, who lent a superintending engineer as manager, and undertook to defray current expenses on condition of monthly repayment. A few weeks later similar arrangements with the Jute Mills Association provided a second site at Hastings Mill. A third factory was established in August, when the Chora Engineering Works, in the Ranigunj coalfield, were taken over. One of the owners was appointed manager at a fixed salary, a certain sum was to be allowed for rent and depreciation, and the factory worked at cost price.

In August the Collector of Bombay was asked to prepare a census of machines for the Bombay district, while the Commerce and Industry Department undertook the rest of India and Burma. The officers in charge of factories were given full powers to negotiate for the transfer of plant, and the results were fairly good, though most of the machines obtained were of poor quality.[1]

During this preliminary period, the scope of the Ordnance Inspection Department was extended to cover the new activities, and in June a number of railway and Public Works Department officers were sent for training to the Inspector of Ammunition at Dum Dum. When the supply of copper bands and gauges had also been organised, the preparations for shell manufacture were complete.

Work could not, however, begin until specifications were received. As early as 10 July the India Office had been informed that no further action was possible in India until the latest approved drawings of each shell arrived.[2] Drawings sent at the end of July were "for information only," and in August the Viceroy cabled that arrangements had been complete for some weeks, and that factories were merely waiting for reliable working drawings.[3] He was told in reply that the drawings sent could be worked to if essential dimensions were checked by shell of the existing pattern, but drawings did not reach the various factories until September.

(c) Relations between the Ministry of Munitions and the Government of India.

Even by the middle of August, when Indian arrangements were complete, the Ministry of Munitions had little knowledge of what was going on. At a conference held at the Ministry on 12 August, to discuss the munitions capacity of India and the Colonies, General Philipps offered on behalf of the Ministry any assistance required by the

[1] In February, 1916, it was felt that the possibilities had not been exhausted, and Local Governments and Administrators were asked to undertake a further canvass of owners. In the summer of 1916 about half the machines in use had been obtained from private owners, in many cases free.

[2] S/16332/1915. [3] M.W./9605/3.

Committee which the Government of India were understood to have appointed. To this Mr. Fry, the Director General of Stores at the India Office, replied that India was now simply waiting for information and a statement of requirements.[1]

On the same day Ministry requirements from India were defined as the highest possible output of 4·5 in. shell; 13-pdr. up to 10,000 a week, and the balance of capacity in 18-pdr.[2] The Government of India at the end of August promised a monthly output, within four months, of 40,000 4·5 in., 40,000 13-pdr., and 10,000 18-pdr. All shell would be banded and finished, but unfilled, and no heavier nature could be undertaken.[3]

The nature of India's contribution having been thus decided, it was suggested, in September, that a formal contract should be made with the Government of India, and the Contracts Department were asked to make the necessary arrangements. The Government of India, however, had just proposed that the manufacture of munitions outside the Ordnance Factories should be subject to a special financial procedure, and this was considered to obviate the necessity for a formal contract.[4]

The system adopted was as follows[5]: As the cost of manufacture would vary considerably with time, place and output, a fixed price for shell was considered impracticable, and the actual cost of work done would be debited in the first place to railway funds, and after audit and acceptance by the Railway Board would be submitted monthly to the Central War Controller for adjustment against the Ministry. Expenditure on the Munitions Branch would similarly be adjusted monthly. The Ministry agreed to make monthly repayments of expenditure on their account, the sum being provisionally fixed in November as £100,000 a month.

Indian shell, therefore, was not supplied to the Ministry under contract; and moreover the Ministry had no direct dealings with the Government of India. Until November, 1915, offers of assistance, though they eventually reached the Ministry, were made through the India Office to the War Office; and in agreeing that the Ministry should in future be approached direct the War Office stipulated that questions relating to supplies from stock should still go to them. The India Office, through whom the early negotiations had been carried out, continued their intermediary functions; and their instructions to India were based on the understanding that the Ministry wished railway workshops to meet railway requirements first and to devote further capacity to shell, on condition that munition work was not made an excuse for placing unnecessary railway orders in England, nor for trying to obtain additional plant.[6]

---

[1] 94/Gen./197. [2] C.R./D.G.S.G./135. [3] M.W./22080/3.

[4] Mr. Hanson wrote: "It does not appear that a contract is intended or that I need make any arrangements."

[5] M.W./9605/5.

[6] A note defining the principles on which the India Office were acting was approved by the Ministry in November, 1915.

(*d*) The Manufacture of Shell.

By the end of September, 1915, shell manufacture was in progress in some 25 factories, of which 16 were railway workshops. There were three special shell factories, and the principal engineering firms in Calcutta and Rangoon, the Public Works Department shops at Amritsar and the Nizam's mint at Hyderabad also turned out complete shell. In some districts small workshops helped with the rough turning, but this did not always prove satisfactory. One of the 4·5 in. shops near Bombay, which was fed in this way by some 60 mills, found that the advantage of an increased initial production was counteracted by the subsequent irregular flow and poor quality of rough turned shell.

Some shops at first undertook more than one type of shell, but by January, 1916, each factory was concentrating on one nature. The majority made 13-pdr. Only four, one of them the Albion Shell Factory, made 18-pdr.; while the 4·5 in. was produced by five railway shops, at Amritsar, and by Messrs. Burn, of Howrah. Originally, only two shops could forge 4·5 in. shell, which was elsewhere turned and bored; but as this process was both slow and wasteful, steps were taken to augment or introduce hydraulic plant, and where this was impossible forgings were supplied from one factory to another.[1]

Steel was supplied in bars by Messrs. Tata, and as their difficulties were surmounted before those of shell manufacture, steel soon began to accumulate. Rolling was therefore stopped for four months at the beginning of 1916, and in May, when it should have begun again, the Ministry had indicated that their requirements for Indian shell would probably cease. The steel was of good quality, and there were no rejections at gun-proof for defective material.

Copper bands, as has been seen, were from the first expected to be a stumbling block, since England could no longer supply the tubing from which in pre-war days bands were made at Cossipore. The Munitions Branch, however, arranged that the mints at Calcutta and Bombay, which held large stocks of Australian copper ingots, should roll strip, from which rings were made, at first, by four railway workshops. The entire manufacture of copper bands was subsequently undertaken by the mints.

Gauges were another early difficulty. It was soon clear that the Gun and Shell Factories could supply only inspection gauges; and workshop gauges were undertaken by the Bombay mint, Amritsar Public Works Department shops and Jamalpur, the largest Indian locomotive shop. Master sets, which should have been supplied by Cossipore, were delayed, and the gauges at first produced were inaccurate. In order to avoid discrepancy, it was decided in October, 1915, that manufacturing and inspection gauges should be produced together; and Bombay then undertook all 4·5 in. gauges, Jamalpur 18-pdr. and Amritsar 13-pdr.

[1] The change was hastened by Ministry instructions received in January, 1916, that all 4·5 in. must be forged.

All shell were inspected before they left India.[1] The inspectors who had been trained at Dum Dum in June, 1915, were stationed at the various factories, and were responsible to the Inspector of Ammunition, who periodically visited each shop. The inspection and manufacturing organisations were quite distinct, though close relations were maintained between the Ordnance Inspection Department and the Munitions Branch. Gun-proof was carried out by the Proof and Experimental Officer at Balasore, and when all tests were complete shell were despatched for shipment to the General Storekeeper of the Great Indian Peninsula Railway at Bombay. Burmese shell were shipped direct to England by the Burmese railways.

Lack of skilled labour was a serious trouble, which was remedied chiefly by training unskilled men to perform single operations. One enterprising factory, the Albion Foundry, imported Chinese turners from Hong Kong. In the case of the Chora Shell Factory, a special Ranigunj Coalfields Munitions Committee was found necessary to take the matter in hand. Piece-work, introduced wherever possible, was found to increase output, and a bonus system adopted by some factories had good results. At Lahore, output of 13-pdr. was rapidly increased from 600 to 900 a week by this means. Night shifts were worked by one or two factories, but were not as a rule possible for want of European supervisory staff.

(*e*) The Closing Down of Production.

Manufacture had not been in progress for more than six months when the question of dispensing with Indian supplies of H.E. shell arose.[2] Requirements could, it seemed, be covered from other sources, and Indian supplies were at a disadvantage as the result of transport difficulties. Towards the end of April, 1916, the Government of India were informed that H.E. shell were no longer urgently required, and should be replaced if possible by 18-pdr. and 13-pdr. shrapnel. They replied that their whole shrapnel production was needed for Mesopotamia and the Territorial Batteries in India. They assumed that their existing stocks of H.E. steel, sufficient for five months' manufacture, should be exhausted, and asked whether further steel should be ordered so that manufacture could if necessary continue. An immediate ruling on this point could not be given, but the Government of India were advised not to order further supplies.[3]

During the following months frequent requests for a final decision were received from India ; and at the end of July the Ministry stated that no more H.E. shell would be wanted, but that steel would be

[1] In November, 1915, C.I.W. wrote to D.D.G. (C) : "I assume that all stores that may be supplied by India will be inspected out there, and that I shall not be concerned." The Ministry agreed (C.R./2705).

[2] At the end of March, 1916, when some 15,000 shell had reached England, Mr. Hanson wrote to Mr. West: "I think you do not want these shell, and it would probably be desirable to bring the deliveries to an end."

[3] C.R. 2905.

welcome.[1] The total monthly output of shell was at this time 130,000, considerably more than had been promised, and was still increasing. Instructions were at once issued to all shops to close down, but in September the Ministry agreed that shell in process of manufacture should be completed and delivered together with shell already finished. The work, therefore, did not completely cease until the end of the year, by which time some 220,000 4·5 in., 170,000 18-pdr. and 430,000 13-pdr. had been made.

At the end of December, 1916, increased requirements of 4·5 in. and 18-pdr. induced the Ministry to ask if manufacture could be continued. The Government of India replied in January, 1917, that the whole organisation had been broken up, and steel was no longer available. Large demands for steel rails for Mesopotamia had for some months made a heavy call on Tata's output, and at the end of November the Ministry had asked for an additional 20,000 tons of rails during the first few months of 1917. Further shell manufacture was therefore impossible.

III. The Indian Munitions Board.

In May, 1916, the Government of India appointed an Indian Industrial Commission, under the presidency of Sir Thomas Holland, to examine the possibilities of general industrial development and decide what form State encouragement to industry should take. The Commission soon came to the conclusion that India's immediate contribution to the war might be increased; and, as a result of their recommendations, Sir Thomas Holland was, at the end of January, 1917, asked by the Government of India to organise a special department to co-ordinate and stimulate the production of munitions and other essential supplies.[2]

The further exploitation of Indian resources for war purposes was also under consideration in England at this time. The exigencies of submarine warfare and the particular dangers of the Mediterranean passage had led to general recognition of the principle that India ought to be self-contained for her own defence and had given a new importance to supplies from that country to the Eastern theatres of war. As has been seen, an attempt was made at the end of 1916 to obtain renewed supplies of H.E. shell; and at the beginning of February, 1917, a telegram from the India Office urged the Government of India to review the whole situation as regards munitions and to make every effort to increase supplies.[3] In reply, the Government of India reported the appointment of Sir Thomas Holland.

---

[1] In August the Government of India offered 4,000 tons of shell steel to the Ministry, but withdrew the offer in September because new demands had arisen in India.

[2] *Report of the Indian Industrial Commission*, 1916-18. (Copy in HIST. REC./R/1143/12).

[3] P./India/527.

This was approved by the home Government; and on 16 February the Gazette of India announced the formation of the Indian Munitions Board.

The aim of the Board was to develop India's resources of all kinds, not only those which would meet war needs, though these were, of course, the first in importance. The circumstances of the war, moreover, limited the Board's wider activities, and prevented the inauguration of the many new industries required to make India self-contained. The chief duties of the Board during the war were to limit and co-ordinate demands for articles not produced in India; to apply the manufacturing resources of the country to war purposes; and to organise supplies to the forces in the field.

As originally constituted,[1] the Board consisted of the President, Secretary, and three members, one of whom was the Financial Adviser to the Army Department. Those functions which it was possible to centralise were carried out by a series of headquarters branches. These included an Indents Branch, through which passed all indents on India from armies overseas; a Priority Branch, which dealt with applications to import articles on the prohibited list and also scrutinised all Government indents, passing those which must be obtained from England, and in other cases bringing demand into communication with local supply; an Industrial Intelligence Branch, which acted as a clearing house for information and supplied the data on which other branches worked; and a General Branch, which dealt with the powers and procedure of the Board, audit and finance arrangements, personnel and general correspondence. Moreover, important supplies, such as timber, hides and wool, railway supplies and inland water transport supplies, were dealt with by central branches.

In addition, there were a number of provincial controllers, who were responsible for minor localised industries, for the collection of information with regard to local resources, for the application of rules under the Defence of India Act in seizing stocks and controlling firms, and for the preliminary examination of applications to import or export.

In order to ensure continuity of supply as far as possible, the Board extended its activities gradually, and did not immediately take over all the various organisations already in existence for the manufacture or purchase of war stores. In point of fact, the Board never interfered with the arrangements for the purchase of mica and other raw materials. Nor was it originally responsible for the Ordnance Factories, although it purchased articles required by the Ordnance Department which were beyond the capacity of the factories. At the end of 1917, however, the Ordnance Factories passed under the control of the Board, their administration being entrusted to Sir George Buchanan, who became a member of the Board.[2] In July,

[1] P./India/527. M.C./30. [2] M./Gen./09.

1918, when the extension of the factories under the Black Scheme was in progress, Sir George Buchanan appointed an Ordnance Factories Extension Committee, under the chairmanship of the Director of Ordnance Factories, to supervise the constructional work. The administration of the Black Scheme in India was therefore under the control of the Munitions Board.

The extent of the Board's operations may be gauged by the following figures,[1] which show the sums expended by it between 1 April, 1917, and 31 October, 1918. The total expenditure over this period amounted to Rs. 376,425,000. Of this, Rs. 147,226,000 was in respect of factories, the largest items being Rs. 109,137,000 for Army Clothing Factories, and Rs. 33,874,000 for Ordnance Factories. The total expenditure on supplies amounted to Rs. 224,021,000, of which railway materials accounted for Rs. 43,776,000; rivercraft and inland water transport supplies, demands for which from the Eastern theatres of war were very heavy, for Rs. 23,376,000; timber, for Rs. 23,004,000; textiles and jute, for Rs. 16,601,000; and ordnance and miscellaneous stores, which included supplies of all kinds of machinery and engineering equipment required for the docks and workshops constructed in Mesopotamia and East Africa, for Rs. 117,464,000.

As regards railway materials, the Indian railway workshops, as has been seen, were by far the most up-to-date of Indian industrial establishments, and their output constituted an important part of India's contribution to the war. Railway materials were sent to Mesopotamia, East Africa, Egypt, Aden and Bushire, the total supplies being 229 locomotives, 5,989 vehicles, 1,855 miles of railway track, and about 13,000 ft. of bridging. 985 miles of railway track were supplied by the Tata Iron and Steel Company, the distribution of whose output was controlled by the Government.

IV. The Supply of Raw Materials.

Among the raw materials which have been obtained from India (including Burma and Ceylon) are mica, manganese ore, magnesite, chrome ore, wolfram, shellac, plumbago, lead, corundum, cotton and cotton waste, saltpetre, nuts, beans and seeds (for oil), and rubber.[2]

Perhaps the most important of these supplies was mica, since India produced about three-quarters of the world output, and up to 1917 was practically the only source of British supplies. In September, 1917, the Government of India prohibited the export of all mica save to the United Kingdom, and this prohibition held good throughout the war. It was subsequently found necessary to take steps to increase output, particularly of the higher grade qualities, required for aircraft, and in May, 1916, the Government of India appointed the firm of

[1] Memorandum on *India's Contribution to the War in Men, Material and Money*.

[2] HIST. REC./H/1800/2. D.F.1/Gen./50.

Chrestien and Company as their agents to sort out and purchase the qualities required. This arrangement did not prove satisfactory, and only lasted until March, 1917, after which date firms were permitted to ship their own mica under open market conditions to England. All consignments were, however, warehoused at Calcutta under Government control, and inspected by the Government brokers, who furnished the Ministry of Munitions with an advance description of the contents of each case. The Government of India had, moreover, powers of requisition which were exercised when necessary.[1]

Towards the end of the war attempts were made to increase the Indian output of mica by requisitioning two mines, the Mahesri and Masnodih mines, under the Defence of India Act. The British Government undertook to repay the Government of India, up to a fixed sum, for expenditure incurred in the development of these mines. The output was unexpectedly small, and the mines were actually worked at a loss.[2]

The annual imports of mica from India amounted to about 90,000 cases, valued at £900,000. The whole quantity was disposed of under the control of the Ministry of Munitions, the selected qualities suitable for Government purposes being reserved in equal quantities for England, France, and America.

Another indispensable supply was shellac, India being the only country of production. Under an agreement with the Government of India, the Calcutta exporters supplied the British Government with 20 per cent. of their total export. The amount thus supplied was about 3,900 tons a year, of which 1,800 tons was taken by the Ministry and 1,440 tons by traders, the balance being allocated to the Allies. The greater part of the remaining Indian output went to American traders, and was used chiefly for the manufacture of gramaphone discs.[3]

India was also an important source of manganese ore, the total exports of which during the war amounted to nearly 2,000,000 tons, valued at over £2,500,000.[4] The whole of the Canadian requirements of ferro-manganese were supplied from this source, and a small proportion went to the United States, France and Italy.

Wolfram from Burma was another vital contribution. The Burmese mines, whose output was negligible before the war, were developed until at the end of the war they yielded about one-third of the world's output. The ore sent to England was distributed under the control of the Ministry, the total quantity supplied being about 15,000 tons, valued at over £2,000,000.[4] The Burmese ore represented about two thirds of the tungsten requirement, and when

---

[1] HIST. REC./H/1860/3.

[2] In February, 1919, it was decided to close both mines (D.D.G.M./1179).

[3] D.F. 1/Gen./50.

[4] Statement exhibiting the *Moral and Material Progress and Condition of India during the Year* 1917/18.

in the middle of 1918 the Treasury, owing to the serious currency position in India, pressed the Ministry to cut down supplies from that country to the lowest possible limit, wolfram was one of the materials which were declared to be indispensable.[1]

The relative importance of other Indian supplies of raw materials may be gauged from the reply returned by the Ministry to this Treasury inquiry. Besides mica, shellac, manganese and wolfram, which were of vital importance, the continuance of supplies of chrome ore, cotton and saltpetre was considered necessary. Of the first, the Ministry were committed to the purchase of 1,500 tons a month, the annual expenditure being about £54,000. Chemical traders making dye materials for khaki and leather tanning had also placed orders throughout 1918 for 2,000 tons a month of Baluchistan ore, this being the only material suitable for their purpose. As regards cotton, though at the time of the Treasury inquiry there were no outstanding requirements, any demand which might arise would have to be met from India. The balance of actual commitments for the purchase of saltpetre amounted to 150 tons, of a value of £36,000, and the estimated requirements for the second half of 1918 were 4,000 tons.

This exhausted the list of materials in which the Ministry were at this time directly interested, lead imports having ceased, owing to lack of tonnage. Private traders, however, were also interested in plumbago, the annual imports of which from Ceylon amounted to about 4,000 tons ; and in corundum, of which they imported about 109 tons a year.

---

[1] D.F. 1/Gen./50.

APPENDIX.

APPENDIX

(See above, p. 4.)

The Black and White Schemes.

(*a*) The Black Scheme.

The "Black Scheme" for increasing the shell output of the Ordnance Factories was formulated by Sir Frederick Black, who visited India in the early part of 1917, in reply to a request that an experienced member of the Ministry of Munitions should be sent out to consult with and advise Sir Thomas Holland, the President of the newly formed Indian Munitions Board.[1]

The extensions proposed by Sir Frederick Black[2] were based on the actual expenditure of shell in Mesopotamia. They would provide in the first place an additional output of 20,000 18-pdr. and 5,000 4·5 in. per week, and it was proposed that the plant required for this should be obtained at once from England or America. A second stage, providing for an additional 30,000 18 pdr. and 5,000 4·5 in. shell a week, might be undertaken towards the end of the war, when larger quantities of plant would be available. For any further extensions which might be considered desirable, plant could be imported or manufactured in India, if a machine tool industry could be developed.

Raw materials, except steel, must be imported until India's mineral resources had been further exploited. Filling should be undertaken in India; propellant was already made by the Cordite Factory, but explosives must at first be imported.

For the first stage, shrapnel shell might be undertaken at Ishapore and H.E. at Cossipore, in extension of present activities. There was room at Ishapore for the new buildings required, but not at Cossipore, where the immediate acquisition of 12 acres was recommended. Ultimately, considerable readjustment of work between Cossipore and Ishapore might be desirable, but the disturbance of output which this would involve could not be contemplated during the war. Filling should be done at Dum Dum or Kirkee,[3] and the main part of the constructional work required would probably be at one of these factories. The total cost of buildings, plant and machinery, at prices obtaining in England, might be estimated at £415,000, but £500,000 should be allowed to cover contingencies and the difference of Indian conditions.

---

[1] Estab./Cent./7/30.

[2] The scheme was outlined in a series of notes addressed to the Indian Munitions Board. Copies of these are filed in P./India/526.

[3] Kirkee was finally decided upon.

Though the Indian Munitions Board agreed that the first stage, which would go very little beyond actual requirements, represented the minimum provision if India were to be made self-contained for her own defence, they thought that any further extensions were impracticable during the war, and must form part of the general industrial revolution which they hoped to bring about.[1]

On further consideration, moreover, the Government of India announced a preference for a modified form of the Black Scheme, to give a weekly output of 160,000 shell within four or five months of the receipt of a small quantity of machinery. They were willing to contribute £120,000, which they estimated as the full cost of the smaller scheme.[2]

After considerable discussion with the India Office, who were inclined to support the Government of India's view, the Ministry in August obtained sanction for the first stage of the Black Scheme, on condition that India bore only a quarter of the cost, the rest falling upon the Imperial Government.

The position of the Ministry of Munitions with regard to the scheme was that of agent to the Imperial and Indian Governments in ordering equipment, erecting shops and selecting staff. The Government of India undertook to render any assistance necessary in the constructional work, and to take over and operate the extensions when completed.[3] For the supervision of the preliminary general arrangements, a Ministry committee was appointed, with General Minchin, a former Director of Indian Ordnance Factories, as the first chairman.[4] Later, this committee's functions were somewhat enlarged, and it became the co-ordinating element between the various technical departments interested in the Indian extensions, the responsibility for conducting business with the Indian Munitions Board, and for taking executive action, being vested in the chairman.[5]

In the autumn of 1917 General Minchin went to India to watch the Ministry's interests in connection with the carrying out of the scheme. Until his return to England in September, 1918, General Minchin acted as Liaison Officer with the Indian Munitions Board on matters connected with the Ordnance Factory extensions, but his powers were advisory only.

Under the original agreement for the financing of the scheme, the Government of India, as has been seen, were only to bear a quarter of the cost. As the result of pressure by the Treasury, constant attempts were made to improve this position, and in the autumn of 1917 the Government of India consented to contribute £250,000, then estimated as half the total cost, on condition that the whole of the buildings and plant became their property after the war. As soon as any real progress had been made with the extensions, however, it became clear that the original estimate of £500,000 would be greatly

[1] P./India/526.
[2] M./Gen./09.
[3] M.C./296.
[4] M./Gen./209.
[5] M.C./328.

exceeded, and in September, 1918, the total cost was put at £900,000.[1] The Government of India were most unwilling to increase their contribution, claiming that the extensions would provide an output exceeding India's own requirements, and that their cost was, therefore, an Imperial responsibility.

The position stood thus at the time of the Armistice, when the whole question of the desirability of carrying through the scheme to completion came up for consideration. Although progress had been much slower than was expected, both on the constructional work in India and in connection with the purchase of machinery in England, the scheme had reached a stage at which completion seemed the most economical course. The Government of India were committed to about five-sixths of the total estimated expenditure in India, and in England machinery to the value of £500,000 had been ordered, nearly all of which was ready and quite half already shipped to India.[2] The Demobilisation Board of the Ministry therefore recommended that the extensions should be completed, and the Government of India agreed that it would be best to carry it through in the interests of the Empire and as a war insurance.

The Treasury, who had advocated the curtailment of the scheme to India's actual requirements, were accordingly informed at the beginning of 1919 that no part of the scheme could with advantage be abandoned, and that the total cost was estimated at £975,000, of which under existing arrangements the Imperial Government were liable for all save £250,000.

At the beginning of March Mr. T. L. Matthews, who had succeeded General Minchin as chairman of the Indian Ordnance Factories Extension Committee, went out to India with instructions to ascertain as closely as possible the total cost of the Black Scheme, to report fully on the causes of the excess of the cost over estimate, to arrange for any economy possible without impairing the utility of the scheme, and for any expenditure to which the Indian Munitions Board were not actually committed to be deferred for the present. He was also to negotiate with the Government of India as to the proportion of the expenditure to be borne by them, having been authorised by the Treasury to accept any proposal which would result in India paying not less than half of the total actual expenditure.

(*b*) The White Scheme.

In October, 1917, before General Minchin left for India, it was suggested that he should inquire into the possibility of increased manufacture of munitions other than shell. The Government of India were known to be contemplating a wide development, and should any scheme materialise, the Ministry would wish to be associated with it from the start.[3]

---

[1] P./India/78. [2] P./India/93. [3] M.C./296.

The War Office at the beginning of November gave a semi-official recommendation that investigations should be based on requirements for the maintenance of 15 divisions outside India, but employed in theatres east of the Mediterranean. The India Office, at an inter-departmental conference on 14 November, promised their support, but pointed out that manufacturing capacity could not be increased during the present war to supply a force outside India, so that any scheme of development on the proposed basis could not be considered a war measure. When in December the War Office formally notified their complete agreement with the proposals to exploit thoroughly the resources of India, with the object of maintaining any British force operating east of the Mediterranean, General Minchin was definitely instructed to prepare a scheme for the manufacture of the munitions required to maintain 15 divisions and to make recommendations as to the measures which should be taken to create the necessary industries and manufacturing organisations. As it was understood that General Minchin's inquiries would be purely preliminary and would not commit the Government to any action, War Cabinet approval of the "White Scheme" was not asked.

At the end of January, 1918, the whole situation was reviewed in a report by Sir Thomas Holland. India's present complete reliance on outside sources would, he considered, necessitate an industrial revolution before she could be made even approximately self-contained as regards munitions. Her manufacturing capacity could for some years produce only a small fraction of the munitions required for a modern army. Even with a definite plan of campaign providing artificial stimulus to industry, the materials essential for munitions (all of which, except nickel, India possessed) could not be produced for four or five years; and the production in bulk of finished articles, which would involve much training of labour, must not be expected for several years.

This report,[1] which reached the Ministry at the end of May, held out little immediate hope of success for the White Scheme, and though General Minchin had not submitted an official report, his letters indicated that the Government of India were not disposed to give the scheme any substantial support. On July 12, however, at a meeting of the War Cabinet, the Minister of Munitions expressed the opinion that, in view of the possibility of the war lasting till 1920 and extending towards the frontiers of India, the proposed provision for 15 Divisions was inadequate, and suggested that the Ministry and India Office should together prepare a larger scheme. Mr. Churchill considered that the development of Indian resources must be urged forward as a first class feature of war policy; and he asked the Ministry Co-ordinating Committee to prepare a series of definite practical propositions for the consideration of an inter-departmental conference.[2]

---

[1] Copy in M.C./296.

[2] P./India/69.

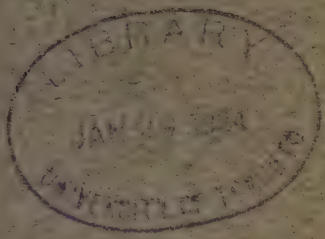
The conclusions reached by the Co-ordinating Committee, after communication with General Minchin, were as follows. They accepted Sir Thomas Holland's statement that only a small fraction of the munitions required for a modern army could be produced in India for some years, so that it would be impracticable to carry out the White Scheme in its entirety as a war measure. General Minchin considered, however, that in the manufacture of rifles and small arms ammunition, and in the repair of guns, rifles and machine-guns, there were possibilities of immediate development, and these should be fully exploited. The production of steel should be assisted in every possible way ; and the Tata Company's scheme for extensions to increase their pig-iron output from 200,000 to 665,000 tons a year should be strongly supported. The plant required by Tata was being held back in America until evidence had been received that the extensions were an urgent war measure. In view of the necessity for stimulating the industrialisation of India and of the strong support given by the War Office to the White Scheme, some such scheme should ultimately be carried out. In all probability large quantities of surplus plant could be transferred to India at the end of the war ; and detailed plans for future development should at once be considered so that Indian factories might be ready to receive plant as soon as it was available.

These recommendations were discussed at an inter-departmental conference at the India Office on 14 August, and were formally submitted to the India Office at the end of the month. They were not again considered by the War Cabinet and as the signature of the Armistice followed shortly afterwards, no immediate steps were taken to formulate plans for carrying out the White Scheme as a post-war measure.[1]

[1] Sec./Gen./1311.

INDEX.

HISTORY OF THE MINISTRY OF MUNITIONS.



VOLUME II

GENERAL ADMINISTRATION

PART VI

AUSTRALIA

VOLUME II

GENERAL ADMINISTRATION

PART VI

AUSTRALIA

CONTENTS.

Australia.

INDEX.

(5034) Wt.3643/AP5036 10/20 250 D.St.

I. Introduction.

At the outbreak of war, the manufacture of munitions in Australia was just beginning. The Government owned certain factories for the equipment of the Australian Army, a Clothing Factory, a Harness Factory, and a Cordite Factory in Victoria, and a Small Arms Factory in New South Wales. The Cordite Factory at Maribyrnong had been producing for two years in July, 1914, but the materials used were nearly all imported, while output at the Lithgow Small Arms Factory only began in 1912 and had not in 1914 reached its normal peace output. In addition to the Government factories, the Colonial Ammunition Company, Melbourne, supplied small arms ammunition, mainly using Government cordite. Successful efforts were at once made to increase the supplies of equipment, small arms and small arms ammunition for the Australian Imperial Force. The Commonwealth and State Governments, supported by all classes of Australians, initiated the manufacture of 18-pdr. shells, but it was found to be impossible to bring this scheme to fruition under war conditions and Australia's greatest and invaluable contribution in war materials was in the form of food, wool and metals.

II. Administration.

(*a*) The Ministry of Defence.

Australian military organisation is entrusted to the Ministry of Defence, under the Minister of State for Defence. At the outbreak of war, this post was held by Senator the Hon. E. D. Millen. On the change of Government in September, 1914, he was succeeded by Senator the Hon. G. F. Pearce, who continued in office throughout the war. The supervision of Government factories and the control of all civilian employees belongs to the Secretary's branch of the Ministry, to which is also attached a Departmental Laboratory.[1]

(*b*) The Federal Munitions Committee.

In June, 1915, the Minister of Defence appointed a departmental committee to consider the manufacture of guns and gun ammunition, but this was quickly merged in the Federal Munitions Committee,

[1] *Report upon the Department of Defence, 1 July, 1914–30 June, 1917, pp.* 10, 14, 459.

which represented wider interests. The official members of the committee were :—

Commodore A. Gordon Smith, R.N., President.
Capt. W. H. Thring, R.N., Director of Naval Ordnance.
Col. H. Dangar, R.A.F.A., Chief of Ordnance.
Col. P. T. Owen, Director-General of Works.
Mr. Marcus Bell, Chemical Adviser, Department of Defence.
Dr. T. R. Lyle, late Professor of Natural Philosophy, Melbourne University.
Mr. Walter Leitch, Business Representative.
Mr. J. F. Barber, Secretary.[1]

The naval administration, which was not separated from the Department of Defence until July, 1915, was fully represented on the committee. Consulting members representing special scientific and industrial interests were also attached to the committee, which held its first meeting on 17 June, 1915.[2] Its activities were various, the chief being (*a*) recommendations for increased output by the Government factories and the extension of the Cordite Factory to include the manufacture of acetone and gun cordite ; (*b*) methods of increasing the local supplies for equipment of the army and navy ; (*c*) organisation of shell manufacture and the provision of materials and a system of inspection ; (*d*) enquiries into the manufacture of other munitions and appliances ; (*e*) consideration of plans for the establishment of a central Australian Arsenal.[3] The Federal Committee appointed sub-committees to deal with special subjects, such as hand-grenades, high explosives and toluene.[4] On the completion of the shell contracts inaugurated by the committee, its activities came to an end and it was dissolved in December, 1916.[5]

(*c*) The State Munitions Committees and the General Committee.

The local organisation of shell manufacture was entrusted to State Munitions Committees appointed by the Governments of the different Australian States. In some States, sub-committees were appointed to investigate special subjects and the State Committees were in close contact with the local labour organisations of their States. To co-ordinate the work of the Federal and State Committees, each of the latter sent a representative to confer with the Federal Committee and meetings of this General Committee were held under the chairmanship of the Minister of Defence.

---

[1] *Report upon the Department of Defence, 1 July, 1914–30 June, 1917*, p. 466.
[2] *Ibid.*, p. 467. [3] C.R.V./A/47.
[4] *Report upon the Department of Defence, 1 July, 1914—30 June, 1917*, p. 486.
[5] *Ibid.*

(*d*) The Directorate of Munitions.

On the dissolution of the Federal Munitions Committee, the Minister of Defence appointed a Directorate of Munitions to carry on during the war certain activities of the former committee. The most important questions which engaged its attention were the compensation to be granted to shell manufacturers for the cessation of shell contracts ; the control of imports and exports of war materials ; the manufacture of glycerine ; tar-distillation ; and the export of rails for the Imperial Government.[1]

(*e*) Relations with the Ministry of Munitions.

The Ministry of Defence was anxious to be in direct communication with the Ministry of Munitions with regard to shell manufacture. The latter, however, preferred that all communications should still pass through the Colonial Office, partly on account of the cabling facilities possessed by the Colonial Office.[2] The High Commissioner of the Commonwealth in London, through whom the Australian authorities placed contracts, etc., in the United Kingdom, dealt directly with the Ministry of Munitions, both as to the supply of drawings or specifications, and on questions of policy.[3]

III. Australian Government Factories.

(*a*) Cordite Factory, Maribyrnong, Victoria.

At the outbreak of war, the Maribyrnong Cordite Factory was producing its full peace-time output, but as a considerable number of spare machines and parts had been accumulated, a rapid increase in the production of small arms cordite was possible. By 30 June, 1916, the output was four times as large as it had been two years previously, while the cost of production showed a steady decrease. In 1917, the change from Cordite Mk.I. size 3¾ to cordite M.D.T. size 5–2 resulted in a smaller production and higher costs.[4]

Buildings and plant for the manufacture of cordite for ordnance were begun in 1915 and completed before 30 June, 1917, and work was begun on a cannon cartridge section. Nearly all the plant was obtained in Australia ; cordite presses, both for small arm and big gun cordite, were manufactured locally for the first time.[5] In August, 1914, the stocks of raw materials at Maribyrnong were considerable, but the factory depended entirely on imported nitrate of soda, acetone and cotton waste. Steps were taken to ensure sufficient consignments of nitrate of soda, but it was considered that other materials could be

---

[1] *Report upon the Department of Defence*, 1 *July*, 1914—30 *June*, 1917, pp. 486–492.

[2] Hist. Rec./R/1144/5.

[3] Hist. Rec./R/1144/3 and D.M.R.S./386.

[4] *Report on Commonwealth Government Factories*, 1915–1916, p. 5 (copy in C.R.V./A/066); *ibid.*, 1917–18, p. 5 (copy in Hist. Rec./R/1144/6).

[5] *Report upon the Department o De ence*, 1 *July*, 1914–30 *June*, 1917, p. 434,

obtained in Australia. A contract was made with a Melbourne firm for acetone, but the price was higher than that of imported acetone and it was decided that the Government should manufacture acetone itself.[1] Plant for the recovery of acetone, used in the process of manufacture, was erected during 1916, great assistance being given in plans and information by the Indian Government Cordite Factory.[2] The building of a subsidiary factory in Queensland for the manufacture of acetate of lime was begun, but the actual production of acetone and also of toluene was to be carried on at Maribyrnong where the buildings and plant were erected during 1917 and 1918. In the latter year extensions were also made for the treatment of crude cotton waste at the Cordite Factory.[3] The Defence Department decided on the outbreak of war that fulminate of mercury should be manufactured as well as cordite. Output was established rapidly and by 30 June, 1915, fulminate of mercury was supplied to the ammunition factory for manufacture into percussion caps for cartridges.[4] At the request of the Imperial Government eight nitrator separators for use in explosives manufacture were constructed and shipped to England,[5] while the management during the years 1915 to 1917 selected about 100 chemists for duty in British explosives factories.[6]

The increased capacity of the factory involved a large increase in the number of employees, the total number being 84 on 30 June, 1914, and 183 on 30 June, 1918.[7] In 1916, in sections of the factory continuous shifts were maintained and were still working in 1918, but during the last year of the war overtime was reduced to some extent. No stoppage owing to industrial disputes occurred at the factory during the war. A Board of Reference was established and working conditions for the factory were settled under an industrial agreement.[8]

(*b*) Acetate of Lime Factory, Bulimba, Queensland.

In January, 1916, the Minister of Defence appointed a committee to inquire into the production of acetate of lime by the fermentation process, by which the stores of molasses in Queensland could be used. The committee consisted of—

Mr. A. de Bavay, Chairman.
Mr. R. J. Lewis, Chief Inspector of Explosives, Victoria.
Mr. N. K. S. Brodribb, Acting-Manager, Government Cordite Factory.[9]

---

[1] *Report upon the Department of Defence*, 1 *July*, 1914–30 *June*, 1917, p. 431–2.
[2] *Ibid.*, 432.
[3] *Report on Commonwealth Government Factories*, 1917–1918 (*Cordite Factory*), p. 1 (copy in Hist. Rec./R/1144/6).
[4] *Report upon the Department of Defence*, 1 *July*, 1914–30 *June*, 1917, p. 435.
[5] *Ibid.*, p. 434. [6] *Ibid.*, p. 437.
[7] *Report on Commonwealth Government Factories*, 1917–1918 (*Cordite Factory*), p. 3.
[8] *Report on Commonwealth Government Factories*, 1915–1916 (*Cordite Factory*), p. 5; *Ibid.*, 1916–1917, p. 2; *Ibid.*, 1917–1918, pp. 3, 5.
[9] *Report upon Department of Defence*, 1 *July*, 1914–30 *June*, 1917, p. 432.

On their recommendation, a factory was built at Bulimba, Queensland. On 30 June, 1918, production of acetate of lime had not yet begun, though the factory was almost complete. Practically the whole plant was obtained in the Commonwealth, of the total expenditure only £418 5s. 3d. being spent abroad.[1]

(*c*) Small Arms Factory, Lithgow, New South Wales.

The full peace-time output of rifles from this factory had not been obtained when the war broke out, but in November, 1914, the management advised the purchase of sufficient machinery to duplicate the existing plant.[2] The difficulty of making the necessary extensions at Lithgow led to a proposal to transfer the rifle factory to a central Australian Arsenal, but it was finally decided that during the war the existing factory should continue.[3] The machinery, required to duplicate the factory, was ordered in August, 1915, and by 30 June, 1917, most of the machines had been erected ; their installation had involved the re-arrangement of most sections of the factory.[4] An additional steam generating set of 200 k.w. was also installed.[5] With the original machinery, however, the output of rifles in the first year of the war was three times that of the preceding year and in the second year it was again doubled.[6] Besides rifles, the factory manufactured bayonets, scabbards, pull-throughs, oil-bottles, arms chests, spare barrels fitted with sights and other spare parts, as well as clips for cartridges, brass buckles and studs, which were turned out in large numbers. The tools, jigs, gauges, etc., needed for the installation of the new rifle plant were also made in the factory.[7]

The position of Chief-Inspector of Factory Viewers was vacated in October, 1915, and by arrangement with the Department of Defence was not filled pending the reorganisation of the military inspection staff, attached to the Ordnance Branch. In August, 1916, the new staff, consisting of an Assistant Inspector of Small Arms and five assistants was appointed. The change resulted in improvement in the work of the factory, but the altered system of inspection involved some confusion and delayed output.[8]

Great difficulty was experienced in obtaining a sufficient supply of skilled labour and it was not until June, 1915, that more men were taken for training, and a night shift instituted. The night shift was gradually increased until it nearly equalled the day shift in numbers, while the hours of the latter shift were reduced to 10, until the demand

---

[1] *Report on Commonwealth Government Factories*, 1917–18 (*Cordite Factory*), p. 2.
[2] *Report upon Department of Defence*, 1 *July*, 1914–30 *June*, 1917, p. 416.
[3] *Report upon Department of Defence*, 1 *July*, 1914–30 *June*, 1917, p. 417.
[4] *Report on Commonwealth Government Factories*, 1915–16 (*S.A. Factory*), p. 4, and 1916–1917 (*S.A. Factory*), p. 5.
[5] *Ibid.*, 1916–1917 (*S.A. Factory*), p. 5.
[6] *Ibid.*, 1915–1916, (*S.A. Factory*), p. 8.
Ibid., 1915–1916 (*S.A. Factory*), p. 5, and 1916–1917 (*S.A. Factory*), p. 1.
[7] *Ibid.*, 1916–1917 (*S.A. Factory*), p. 6.

for a 48-hours week was granted. In 1917, as extra space and new machines became available the number of men and hours on the night shift were reduced.[1]

The employees of the factory were organised in the Small Arms Factory Union and obtained an award given by the Federal Arbitration Court in April, 1915. Various appeals for variation of the award were made by the union and the A.S.E. No complete stoppage of work took place at the factory, except during the coal strike at the end of 1916, but there were many sectional disputes and partial stoppages of work.[2] The most serious of these was due to the continued difficulties in the small, but important, barrel setters' section. The strike in this section resulted in the dismissal early in 1918 of 1,000 employees, while the remaining employees could only be employed in altering 14,072 rifles, manufactured for the use of Mark VI ammunition, to take Mark VII ammunition.[3]

IV. Scheme for the Establishment of an Australian Arsenal.

In September, 1914, the Commonwealth Government urged on the Army Council the necessity for Australia to be in a position to manufacture 18-pdr. Q.F. ammunition within a year. Samples and specifications were promised, but the Imperial authorities could give no other help, and advised sending a deputation to England to study munitions manufacture there. By 18 November, 1914, estimates for a factory with an output of 200 shells daily had been prepared at the Small Arms Factory, Lithgow, but owing to the impossibility of obtaining the necessary plant, either in England or America, the scheme had to be abandoned for the time being.

The need for enlarging the Small Arms Factory at Lithgow, which arose in November, 1914, however, brought up the proposal for establishing a central arsenal, in which the existing factories would be incorporated. The Parliamentary Standing Committee on Public Works held an enquiry and recommended the building of an arsenal on the unoccupied Commonwealth Territory at Canberra, the actual site there being a subject of much discussion. The Imperial Government advised on 30 June, 1915, that an Australian deputation should visit India, as it was impossible to obtain the necessary information by post.[4] By this time the Federal Munitions Committee had been appointed and in September they recommended the appointment of an Arsenal Committee, which was convened on 14 September, 1915. It consisted of—

Col. P. T. Owen, Director-General of Works, Department of Home Affairs, president;

---

[1] *Report on Commonwealth Government Factories*, 1915–1916 (*S.A. Factory*), p. 1 and 1916–17 (*S.A. Factory*), p. 1.

[2] *Ibid.*, 1915–16 (*S.A .Factory*), pp. 3–4 and 1916–17 (*S.A. Factory*), pp. 2–4.

[3] *Commonwealth Government Small Arms Factory, Report for year ended 30 June*, 1918, pp. 4, 5 (copy in HIST. REC./R/1144/7).

[4] *Proposed Federal Arsenal. The Parliament of the Commonwealth of Australia*, 14 March, 1917 (copy in C.R.V./A/043).

Mr. B. T. McKay, Works Manager of Walkers, Ltd., Maryborough, Queensland ;
Prof. Henry Payne, Dean of the Faculty of Engineering, University of Melbourne ;
Mr. Marcus Bell, Chemical Adviser, Department of Defence ;
Major H. B. L. Gipps, Inspecting Ordnance Officer, Department of Defence.
Mr. T. T. Pearson, Department of Defence, secretary.[1]

This committee first viewed the proposed site at Canberra and then went to India, where they were given every facility for inspecting the different factories. In their report, dated 21 December, 1915, they recommended the building of a central arsenal and the adoption of the Tuggeranong site on the Murrumbidgee River in the Federal Territory. The arsenal was to be developed in three stages and would finally include rolling mills, steel works and factories for the production of field guns, small arms, complete rounds of ammunition and all accessories.[2] This report was adopted and it was decided to proceed with lay-out plans. Mr. A. E. Leighton, who as manager of the Cordite Factory had gone to England early in 1915, in connection with proposed extensions in the manufacture of cordite, was appointed general manager. He had remained in England in the Explosives Department of the Ministry of Munitions, which still retained his services, but offered to place all information as to the erection of the arsenal at his disposal.[3] Expert assistance from Australia was sent him to help in preparing the plans, and an Arsenal Branch was established at Australia House under his direction. In order to obtain information as to the latest methods of inspection, it was arranged that Major Gipps, who was on the Arsenal Committee, should come to England to study the question, with a view to his appointment as Chief Inspector in Australia.[4]

The central arsenal was estimated to cost £1,440,000, with an additional £650,000 for housing accommodation for the employees. In the estimates for the Department of Works, for the year 1917-1918, £75,000 was provided for buildings and works on the arsenal and in the estimates for the Department of Defence, £25,000 for plant. By the end of June, 1917, a large contour survey had been made, but the lay-out plans had not arrived from England.[5] Later in the year, however, the question of the suitability of the site was reopened, and another committee was appointed. The Tuggeranong site for the arsenal was confirmed, but the terms of reference had confined the committee to the consideration of inland sites only.[6] At the same time the advice of the Ministry of Munitions was sought, and on 8 January, 1918, a meeting of the Council of the Ministry was held,

[1] *Report upon the Department of Defence*, 1 *July*, 1914–30 *June*, 1917, p. 418.
[2] *Report of Visit to India of the Arsenal Committee*, 21 *December*, 1915 (copy in C.R.V./A/99).
[3] *Report upon the Department of Defence*, 1 *July*, 1914–30 *June*, 1917, pp. 418–419.
[4] C.R.V./A/144.
[5] *Report upon the Department of Defence*, p. 420.
[6] Hist. Rec./R/1144/9.

at which representatives of the Australian Government Arsenal were present. The opinion of the Imperial authorities modified the previous plans of the Ministry of Defence to some extent, as they were against the complete centralisation of the manufacture of munitions. They pointed out that in time of war the whole industrial resources of the Commonwealth must be utilised, so that the purpose of a central arsenal was not so much production as research, improvement of methods of manufacture and technical training. Manufacturers should also be trained in peace-time by distributing small regular orders for munitions.[1] In consequence of this advice the whole question remained in abeyance until after the Armistice. Mr. Leighton was recalled, and he presented a report, which was subsequently adopted by the Ministry of Defence. The Small Arms Factory at Lithgow was to be retained and factories for machine guns and other small arms and equipment were to be established there, while at the Cordite Factory, at Maribyrnong, factories for field guns, carriages and artillery ammunition, including explosives, were projected. Extensive research laboratories were also planned. The Imperial Government in October, 1919, placed at the disposal of Australia for the establishment of the arsenal, munitions plant to the value of £300,000, of which only 50 per cent. would be charged to Australia, and it was arranged that this plant should be selected by the Australian technical staff, in conjunction with the Ministry of Munitions and the Surplus Government Property Disposal Board.[2]

V. Manufacture of Munitions under the Federal Munitions Committee.

(*a*) Manufacture of 18-pdr. H.E. Shell Bodies.

In 1915, the Australian Government renewed the proposal of the previous September that the manufacture of shell should be undertaken, and in June the Governor-General wrote to the Colonial Office emphasising the desire of the Australian mining and smelting companies to work for the benefit of the Australian Imperial Force or the Allied Forces. In answer to the various telegrams from the Commonwealth, the Imperial Government on 9 July, 1915, telegraphed that Australia could best help by making 18-pdr. H.E. shell bodies, of which the Ministry of Munitions could take unlimited supplies. Manufacture of shell of heavier calibres was not advised, as the Ministry were urgent that no machinery from abroad should be imported by Australia.[3] Specifications, etc., were despatched, but using information already in their possession, the Federal Munitions Committee placed contracts through the States Munition Committees with 25 manufacturers (including the Governments of New South Wales, Victoria, Queensland and South Australia) for 20,000 shell bodies for delivery by 31 December, 1915, and 190,000 by 31 March, 1916.[4] The latter date, by consent

[1] Hist. Rec./R/1144/5 and C.R.V./A/99.
[2] Hist. Rec./R/1144/9.
[3] C.R.V./A/42. [4] C.R.V./A/43.

of the Ministry of Munitions was extended to 30 June, 1916.[1] An average flat rate of 21s. for each shell body was fixed.[2] The States organised themselves on different lines. In Western Australia, the whole output was controlled by a co-operative company working on a non-profit basis; in other States various companies, some of which were not engineering concerns, also worked on the same lines.[3] The General Munitions Committee in November, 1915, decided that the urgency of shell manufacture was not sufficient to warrant the establishment of Government control of all engineering factories,[4] though this might be necessary in the future, and it was left to the decision of the manufacturers how far they should continue on private work.

No trained shell inspector could be spared by the Ministry of Munitions to organise an Australian inspection staff and no one in Australia had any experience of shell manufacture. This led to great difficulty in determining the necessary standards and in the case of steel, a sample shell body was finally sent to England for inspection. The Federal Munitions Committee chose as inspectors men, who had had similar experience before. Steel inspection was carried out under the direction of an Inspector of Steel; the chemical and physical tests were made by approved testing officers, working chiefly at a special laboratory at Sydney University; surface inspection of bar steel was carried out at the Newcastle works of the Broken Hill Proprietary Company, under the supervision of the steel inspector. The staff for shell inspection consisted of a Chief Inspector of Shell, one inspector of shell for each State and one or more viewers for each factory. These officials all had to be trained, but by October, 1915, the State inspectors had entered on their duties and viewers were ready as each contractor took up work. The staff was afterwards strengthened by the return of Australian officers with experience in British factories.[5]

A shortage of skilled labour was expected as shell manufacture developed and arrangements were made for the release from the Australian Imperial Force of indispensable men. The Federal Munitions Committee intended that these men should be enrolled in the munition workers corps, but it was afterwards felt to be impracticable to place the employees under Government control, so long as the contractors were free to undertake private contracts as well as Government shell contracts. It was decided that men so discharged should have their military certificates specially endorsed and later a badge was granted to all munition workers.[6]

The Australian labour organisations loyally supported the Munitions Committees and on several of the State Committees they

[1] Hist. Rec./R/1144/2. [2] C.R.V./A/43.
[3] *Ibid.* [4] C.R.V./A/47.
[5] *Ibid.* and *Report upon the Ministry of Defence*, 1 *July*, 1914–30 *June*, 1917, p. 485.
[6] C.R.V./A/47 and *Report upon the Ministry of Defence*, p. 484.

were directly represented. The A.S.E. assured the Minister of Defence at Adelaide that their executive would sanction no stoppage of munition work for any cause and the general organisations such as the Trades Halls and the Trades and Labour Council in New South Wales were prepared, if occasion should arise to sanction the relaxation of rules. Locally, however, difficulties arose. There was much opposition to the contractors' profits on shell-making and in New South Wales in particular there were demands for special rates of pay for munition work. A short strike actually occurred at the Newcastle Steel works, over the A.S.E. award granted in October, 1915. The same union took up a very violent position with regard to the employment of non-union viewers of shell, but their action was thought to be largely influenced by jealousy of their rivals, the Australian Society of Engineers.[1]

Except for one standard set of gauges, ordered from Woolwich by the Federal Munitions Committee, and six sets later obtained by the High Commissioner in England, all the gauges used were manufactured in Australia, from drawings received from England. The committee ordered 30 sets from the Commonwealth Naval Dockyard at Cockatoo Island and 10 sets from Newport railway workshops. These were tested at Melbourne University and the most accurate issued as standard sets to the State inspectors of shell. Shop gauges were obtained from gauge manufacturers either by the States Munitions Committees or by individual contractors.[2]

The Federal Munitions Committee accepted the offer of the Broken Hill Proprietary Company, Ltd., to supply steel from their Newcastle works at £10 a ton for three months, provided that it was only used for shell manufacture. The first shell steel was passed by the steel inspectors on 31 August, 1915,[3] but the first shell bodies made from Newcastle steel showed rokes. Advice was obtained from England in December, 1915, but the difficulty was not finally overcome when the first consignment of shells was shipped to England in the following May. Experiments were continued and shell steel was afterwards accepted for shipment to England.[4] Delays were also encountered in the provision of steel for base plates owing to lack of rolling facilities. Arrangements were made to import copper tubing for driving bands, but the necessary plant for drawing it was set up at Sunshine, Victoria, and at Randwick, New South Wales.[5]

Owing to the various initial difficulties, the first delivery of shell bodies, made by the Queensland Government Railways, did not take place till March, 1916.[6] Two small consignments were shipped to England in May for final inspection, but before this took place,

---

[1] C.R.V./A/47.

[2] *Ibid.* and *Report upon the Ministry of Defence*, p. 480.

[3] *Report upon the Ministry of Defence*, p. 469.

[4] C.R.V./A/47 and D.M.R.S./386. [5] C.R.V./A/47.

[6] *Report upon the Ministry of Defence*, p. 470.

the whole shell position had changed. The Ministry of Munitions had so organised shell manufacture in the United Kingdom, that there were ample supplies of 18-pdr. shell, and as early as February it had refused the offer of the Government of Tasmania to equip a new factory.[1] In June it was decided to stop the manufacture of 18-pdr. shell bodies in Australia, and though the Commonwealth Government offered to turn over to heavier shell and samples were manufactured, this offer was also refused and the Ministry urged that Australia could best help by supplying munitions materials and railway material.[2] This decision was largely based on the geographical difficulty. It was found impossible to keep the Commonwealth authorities in touch with the latest changes in design ; a specification frequently did not reach Australia before it had been superseded in England. Transport difficulties were increasing and it was more advantageous to ship ore or metals than the manufactured shell bodies. The price of shells in Australia was also nearly double that ruling in England, owing to high wages and undiluted labour, and in addition there were the high shipping rates for the long voyage. The quality of the 18-pdr. shell bodies made in Australia was very satisfactory. The report on their inspection in England, made in August, 1916, was so favourable that it was decided to ship all shell bodies, about 19,224 in all, waiting shipment to England. The first two consignments were re-inspected, but the remainder were sent direct to the Filling Factories.[3]

(*b*) Other Activities of the Federal Munitions Committee.

The sub-committee on hand grenades recommended the adoption of the Welch-Berry hand grenade and 15,000 were manufactured and sent to England. In view, however, of the necessity of adopting a standard hand grenade no more were made.

A respirator, designed at Melbourne University, was adopted and 10,000 complete respirators, together with refills, were supplied to the Australian Imperial Force, but no more were ordered as a standard respirator was adopted.[4]

The Federal Munitions Committee also investigated proposals for sending mechanics to England to work on munitions during the war, so as to form a nucleus of trained men for the Australian Arsenal. A comprehensive scheme was recommended and the Minister of Defence appointed a Central Selection Committee to settle arrangements and conditions of employment, and to select suitable men. Up to 30 June, 1917, 1,938 skilled workers, navvies, and labourers had left for England under this scheme.[5]

---

[1] Hist. Rec./R/1144/2. [2] D.M.R.S., 386.
[3] C.R.V./A/48 and *Report upon Ministry of Defence*, pp. 477, 479.
[4] C.R.V./A/47 and *Report upon Ministry of Defence*, p. 482.
[5] *Report upon Ministry of Defence*, pp. 484–5.

VI. Supply of Munitions Materials.

The contribution of Australia in the supply of metals needed for munition purposes had far-reaching effects, since it enabled the Imperial Government to obtain a regular supply of certain materials at non-speculative prices. The Commonwealth was rich in lead, copper, and zinc, and also contributed tungsten ores, antimony, platinum, besides steel and railway material. The first year of the war was mainly occupied with the elimination of German control over metals. The measures taken included the dissolution of the lead combine controlled by Germans ; the dissolution of the zinc combine, a purely German organisation, which controlled the spelter market all over the world ; and the elimination of German interests dominating the copper industry in Australia and of various German agencies connected with other metals.[1] In May, 1915, an Act was introduced into the Commonwealth Parliament declaring every German contract for ores, concentrates, and metals void and enemy shareholders were removed from the share registers of every company in Australia.[2]

To some extent the policy of the Commonwealth Government of fostering the local metal industry clashed with that of the Ministry of Munitions.[3] Shipping difficulties also limited the actual delivery of Australian ores, but the loyal support of the Commonwealth helped to place the Ministry of Munitions in a strong position when dealing in neutral markets.

The most urgent matter, at first, was the supply of tungsten ores. In September, 1915, the Commonwealth Government requisitioned all the production of wolfram, scheelite and molybdenite[4] and at the same time the Imperial Government contracted for a year for the whole Australian output, fixing prices and grades.[5] The contract was extended and then renewed in May, 1917, but in spite of the revised terms[6] the Australian producers were dissatisfied and output dropped in 1917. Lengthy negotiations took place, but with the increased Burmese production of wolfram, the Australian supply had become less important and the Ministry of Munitions could not accept the Australian proposal for a ten years' contract.[7] Further revisions of terms were made, however, for the output of 1918.[8] The quantities of wolfram and scheelite shipped from Australia from the date of the original contract were 267½ tons, for four months of 1915, 1,025½ tons in 1916, and 798 tons in 1917.[9]

---

[1] C.R.V./A/023. [2] C.R.V./A/73.

[3] (*Printed*) *Weekly Report, No.* 27, I (29/1/16) and *No.* 33, I (11/3/16).

[4] *Report by Mr. J. M. Higgins to Commonwealth Government,* 11 September, 1916 (copy in C.R.V./A/023). [5] *Ibid.*

[6] C.R.V./A/170. [7] C.R.V./A/265. [8] *Ibid.* [9] *Ibid.*

The Australian contribution of lead was especially important, as without it the position in the United Kingdom would have been serious. In July, 1915, the Broken Hill Associated Smelters Proprietary Company, Ltd., which owned large silver lead smelting works at Port Pirie[1] in South Australia, offered the whole of their output on very favourable terms, but it was not till the following year that the Ministry of Munitions realised the necessity for controlling additional supplies of lead. In May, 1916, a contract was made with the Broken Hill Company to secure their whole output, on such favourable terms that they reacted on prices in America. The output of the Fremantle Trading Company, which had just erected a smelting plant with an estimated annual output of 5,000 tons, was also secured. At the beginning of 1918, these contracts, which were to remain in operation until hostilities ceased, secured a monthly output of 13,000 tons, an amount equalling two-thirds of the requirements of the Ministry of Munitions.[2]

Towards the close of 1915, the Zinc Producers' Association Proprietary, Ltd., was formed to handle all zinc concentrates produced in the Commonwealth,[3] which before the war supplied one-fifth of the world's production of spelter. Of this, however, 90 per cent. had been smelted in Germany and Belgium, and until increased smelting capacity could be provided in Australia and in the United Kingdom, large quantities had to be shipped to America.[4] In August, 1916, the Ministry of Munitions, which had not accepted the Imperial scheme put forward by the Zinc Producers,[5] made a contract with them for 100,000 tons of zinc concentrates at a fixed price. Further contracts were made and the price revised in favour of the Ministry, and finally it was agreed to take, as from 1 July, 1918, the whole production controlled by the Zinc Producers during the war and for 10 years afterwards.[6] Owing to the shortage of freight, the shipment of Australian concentrates was stopped after January, 1918, by order of the Shipping Controller.[7]

Australian copper had also been largely exported to Germany for treatment, and it was decided to ease the situation in the Commonwealth by employing Mount Morgan and Wallaroo copper in ammunition work.[8] Other copper was sent to America, but by the end of 1916, arrangements had been made for the treatment of all ores and copper products in the Commonwealth.[9]

The Ministry of Munitions made contracts with the chief producing companies to purchase their entire output of copper at a fixed

---

[1] C.R.V./A/023.
[2] Hist. Rec./H/1850/3.
[3] C.R.V./A/023.
[4] Hist. Rec./H/1840/1.
[5] (*Printed*) *Weekly Report, No.* 46, IV (17/6/16).
[6] Hist. Rec./H/1840/1.
[7] (*Printed*) *Weekly Report, No.* 125, III (12/1/18).
[8] C.R.V./A/10.
[9] C.R.V./A/023.

price.[1] In 1917, the companies formed the Copper Producers' Association, with whom the later contracts were made extending till the end of 1918, but the Ministry would not enter into a long term contract as desired by the Association.[2]

The Ministry of Munitions entered into a contract with the Broken Hill Proprietary Company for 2,000 tons of shell steel, of which 500 tons arrived in April, 1916.[3] Contracts were also made for 10,000 tons of steel for shell noses.[4] The Commonwealth in December, 1916, offered to give half the Australian supplies of steel and iron to Great Britain for munition purposes.[5] Contracts were also made to supply 30 miles of rails a month to France, 20,000 tons of rails and fishplates to Great Britain,[6] and supplies of rails, etc., to South Africa.[7]

VII. Review.

A just appreciation of the achievements which have been thus briefly narrated depends upon a study of the immense difficulties which were encountered. With the exception of the Cordite Factory at Maribyrnong and the (incomplete) Small Arms Factory at Lithgow, Australia began the war entirely unequipped for armament production. The capacity of the one factory was ultimately increased fourfold, and an entirely new unit established for producing ordnance cordite ; the original lay-out of the Small Arms Factory was duplicated and its output of rifles alone was brought up to six times the number produced during the year preceding the war.

The organisation of shell manufacture presented a more serious problem, since the Commonwealth possessed neither experience nor plant, and the United Kingdom could spare neither machinery nor skilled workers. Intent upon helping to meet the outstanding need of the early years of the war, the Australian Government, acting through the Federal Munitions Committee, succeeded in organising a scheme for 18-pdr. shell production among the industrial works of the various States. The arrangements made by the States Munitions Committees varied in form. One of their most remarkable features was the development in certain instances of production by a co-operative company working on a non-profit basis. By March, 1916, the practical difficulties of initiating an entirely new industry had been overcome. Plant, gauges and tools had been manufactured in the Commonwealth. Inspectors and viewers had been trained. An output of empty 18-pdr. shells of very satisfactory quality had been obtained.

---

[1] C.R.V./A/295. [2] C.R.V./A/342. [3] M/B/35.
[4] Hist. Rec./R/1000/116.
[5] " *The Argus,*" 13 December, 1916 (copy in C.R.V./A/173).
[6] Hist. Rec./R/1000/116.
[7] *Report upon the Department of Defence, 1 July,* 1914–30 *June,* 1917, p. 489.

The geographical difficulty could not, however, be eliminated. The need for standardising weapons along the lines of the experience gained by the armies in Europe obliged the Federal Munitions Committee to abandon several projects for manufacturing munitions of various kinds. Similarly, difficulty in obtaining prompt information as to current changes in design hampered the progress of the schemes for shell production. These were ultimately abandoned in 1916 on this account, and also in view of the difficulties of transport and of the comparative advantages, practical and financial, of manufacture in the United Kingdom over production in Australia.

Similar considerations did not affect the use of the great mineral resources of the Commonwealth, which was mainly restricted by the amount of tonnage available. During the first year of the war Australia eliminated the enemy interests which had controlled her lead, zinc and copper industries. She gave to the Ministry of Munitions a loyal support, which brought with it not only the material benefit of a supply of invaluable ores, but also great moral advantages in dealing with neutral markets. In particular, the Australian supplies of lead equalled two-thirds of the whole of the requirement for the British forces.

While the main contribution of the Commonwealth towards munitions thus consisted of materials, which could be more readily supplied and shipped than the finished article, the efforts to establish independence in respect of armaments was destined to bear fruit in the inception of an Australian Arsenal. The original project to construct a great central factory for all classes of warlike stores was subsequently modified by the light of experience already gained by Great Britian. Accordingly, post-war plans involve the sub-division of manufacture among the state factories already existing as well as at the newly-projected arsenal, while the principles of giving out contracts in peace time in order to ensure expansion in an emergency and of reliance upon state factories for experience and research have been accepted by the Commonwealth.

INDEX.

HISTORY OF THE MINISTRY OF MUNITIONS.

VOLUME II

GENERAL ADMINISTRATION

PART VII

CONTINENTAL ORGANISATION

VOLUME II

GENERAL ADMINISTRATION

PART VII

CONTINENTAL ORGANISATION

CONTENTS.

Continental Organisation.

APPENDIX.

INDEX.

PART VII.

CONTINENTAL ORGANISATION.

1. Mr. Sawyer's Organisation in France and Switzerland.

(*a*) Preliminary Negotiations, May to September, 1915.

Towards the end of May, 1915, Lord Kitchener undertook to order a considerable quantity of fuses on behalf of Russia. The Russian Ministry of War wanted an immediate output of 100,000 a month for shell in process of manufacture, and their requirements were expected to increase in two or three months' time.[1] The prospect of obtaining large additional supplies from British fuse makers was remote in the extreme, for orders placed by the War Office were considerably in arrears. The demand had increased with the expansion of the shell programme, and it was clear that the existing sources of supply would no longer be adequate to meet British, let alone Russian requirements.

A solution of the difficulty was offered by Switzerland, whose large watch-making industry made her peculiarly suited for the highly skilled work involved in fuse manufacture. In point of fact, a considerable amount of work of this nature was already being carried out both for France and for Germany. The French Government had not placed direct orders, but Government contractors had turned to Switzerland in the early days of the war before French fuse capacity was fully organised. A French Government official supervised the Swiss work to prevent overlapping and congestion. Raw material was supplied from France, and filling took place there, since the Swiss Federal Government prohibited the export of filled fuses.

Swiss capacity was, however, by no means fully absorbed, and from time to time offers of manufacture had been made to the War Office by individual firms, or by firms proposing to organise work on the group system; but these had been refused in recognition of the French Government's prior right to Swiss output. Towards the end of May, the urgency of the Russian needs was such as to override all other considerations, and the question of placing contracts in Switzerland was discussed with the French Military Attaché by Mr. Wintour, Director of Army Contracts, to whom the purchase of munitions for Russia was entrusted by Lord Kitchener.[2] M. de la Panouse pointed out that French fuse capacity had developed, and was now not fully absorbed, so that some requirements might be met from that source. The French Government did not want to order

[1] R.S.C./F/29. [2] C.R./4502.

(3761) Wt. 3643/AP5036 10/20 250 D.St.

French fuses in Switzerland until their own factories were fully occupied; but they were, at the same time, very anxious that no Swiss contracts, either for British or Russian fuses, should be arranged without consultation with them.[1]

After some preliminary discussion between M. Thomas, the French Minister of Munitions, and a representative of the Ministry who went to Paris in the middle of June, the question of fuse production came up for consideration at the meeting of Ministers held at Boulogne on 20 June. Mr. Lloyd George then agreed to place no direct orders in Switzerland, and to refer to the *Ministère de la Guerre* any offers of help received from French manufacturers. M. Thomas undertook to organise fully the Swiss production of fuses, and to supply Great Britain, whose requirements were estimated at 10,000 a day, Russia, or other Allies.

A few weeks later, however, the situation changed, the French Government having apparently come to the conclusion that their own fuse requirements could be met in France, and that they would not need the Swiss production. By the final agreement, reached at a conference at Whitehall Gardens on 7 July, the British Government consented to accept the whole surplus production of H.E. fuses in France for the next six months, and to leave to the French Government the entire responsibility for negotiating with manufacturers and for placing and supervising contracts in France. On this condition the British Government were to be free to place direct orders in Switzerland, but only in co-operation with the authorised French representative. The French Government had already placed orders on behalf of Russia for 600,000 fuses, and were to be responsible for any further orders that might be required.

In the meantime, the capabilities of the Swiss firms who had offered to undertake work for the British Government had been inspected by the Ministry representative, Mr. Angus, and the result of his investigations being satisfactory, he was at the end of July given power to sign provisional contracts, and instructed to open an office in Berne. A contract for the No. 100 fuse was immediately arranged with the firm of Fabrique des Montres Zenith, of Le Locle, on the understanding that the gaines would be supplied by the French Government, with whom negotiations were in progress.[2]

By the end of August further Swiss orders for fuses, gauges, optical munitions and machine tools were under consideration, and it was decided to appoint a permanent representative to look after the interests of the Ministry in Switzerland. At the beginning of September Mr. E. E. Sawyer was selected to fill this post.[3]

Mr. Sawyer was also to represent the Ministry in France, where negotiations had hitherto been carried out by Colonel Le Roy Lewis, the Military Attaché to the British Embassy. M. Thomas' consent

[1] R.S.C./F/29. [2] 94/Misc./42. [3] D.D.G. (B)/7.

had already been obtained to the placing of direct contracts for fuses with two French firms, and a formal offer had also been made for the production of gaines, the responsibility for which was to rest with the *Service des Forges*, though Ministry inspectors were at any time to have access to contractors' works.

At the end of September it was decided to open another branch office of the Ministry in Paris, under the general supervision of Mr. Sawyer. This office was to act as a channel of communication with the French Government and with firms employed ; to arrange the terms of contracts ; to secure supplies of gauges, and of materials : and generally to help forward the execution of contracts.[1]

(*b*) Administration.

The branch of the Ministry of Munitions which dealt with continental supplies, and to which Mr. Sawyer reported, was B.M. 2, a section of Mr. G. M. Booth's department (D.D.G. (B)). B.M. 2, the Director of which was Mr. W. J. Benson, was responsible for all the headquarters' side of the continental work. The branch ascertained requirements from supply departments ; obtained the approval of the Contracts Department to contracts negotiated by Mr. Sawyer ; arranged for the supply of the necessary raw materials, gauges, etc. Originally, B.M. 2 acted as the channel of all communications to and from Mr. Sawyer, and was thus in a position to centralise all information on continental matters and to co-ordinate the interests of the various departments concerned with French and Swiss supplies. At the end of 1916, it was decided that the control of continental fuse orders should be vested in the Shell and Components Manufacture Executive Committee, and that departments concerned should communicate direct with Mr. Sawyer. Copies of correspondence were, however, sent to B.M. 2, and the continuance of the branch's co-ordinating activities was secured by the appointment of Mr. Benson as a member of the Shell and Components Manufacture Executive Committee. B.M. 2 continued to deal with continental supplies other than gun ammunition, components and gauges.

On the formation of the Munitions Council in September, 1917, and the consequent dissolution of the Shell and Components Manufacture Executive Committee, it was decided that all the continental work should be brought together again, and that the natural place for it was the Allies Group, under Sir Charles Ellis. At the beginning of 1918, Mr. Sawyer's organisation also came under the general control of Sir Charles Ellis, on his appointment as head of the *Mission Anglaise de l'Armement*, whose functions included the co-ordination of all the Paris establishments of the Ministry.[2]

Mr. Sawyer, on his side, was responsible for the negotiation of contracts, which were, however, submitted to the Contracts Branch for final approval ; the payment of contractors ; the supervision and

[1] C.R./2768

[2] See below, p. 12.

distribution of raw materials ; and for the transport across France of finished munitions.[1]

As regards payment of continental firms, the contracts provided that 80 per cent. of the price should be advanced after preliminary inspection, in France, when contractors could produce proof that delivery had been made at a French port ; in Switzerland, when the Berne Office had received an official railway receipt and export permit for the goods in question. The balance was paid after final inspection in England. The value of the material supplied by the Ministry was deducted from the price of the finished product, and no material was paid for in cash. As a safeguard, in the case of Swiss firms, no payments were made on contracts until deliveries were sufficient to cover the amount of material issued.

Payments on French account were effected from London until the middle of 1917, and after that direct by the Paris Office. Mr. Durant, the manager of the Paris Office, had an imprest account which covered his own requirements and those of the Optical Munitions Branch.[2] In Switzerland, the Treasury arranged for weekly remittances to be telegraphed through to Mr. Sawyer's bank by the Bank of England In April, 1918, a Swiss loan was arranged, and sums were then transferred to Mr. Sawyer's credit by a special arrangement between the Treasury and the Swiss Federal Government. Monthly accounts, showing the imprests received and the payments made, were sent to the Ministry by both the Berne and the Paris Office.

The supervision of raw materials, the supply of which by the Ministry was a condition of most of the continental contracts, was an important part of Mr. Sawyer's work, especially in Switzerland. French contractors took delivery of their metal at French ports, but the Ministry were responsible for conveying Swiss supplies across France. The arrival of material required by contractors was frequently delayed, particularly at first, as the result both of shipping difficulties and of congestion on French railways, which made the time taken in transit across France a most uncertain factor. The Ministry were placed on an equality with French Government Departments as regards transport, and special facilities were granted whenever possible ; but delays were occasionally inevitable.[3] At the end of 1915, the Ministry's failure to supply brass rod within the time promised to two fuse contractors resulted in a claim for damages, which had to be allowed. From this time onward, all contracts provided that should the Ministry be prevented by *force majeure* from supplying brass required, it would incur no liability for damages, but the delay would be compensated for by an extension of the time of delivery.

---

[1] He also undertook a certain amount of supervision of the sub-contracts placed in Switzerland by British firms. From January, 1917, all British fuse contractors had to submit to the Ministry any proposed orders in Switzerland, and Mr. Sawyer's approval was asked before such orders were sanctioned.

[2] See below, p. 9.

[3] C.R.V./S/335. R.S.C./F/8.

Shipment of the metal to the continent was effected by the Overseas Transport Department, through the Admiralty. Ministry agents were appointed at French ports, and any necessary negotiations with the French Government were conducted by the Paris Office. Metal intended for Switzerland travelled across France on *bons de transport*, which gave it precedence over commercial traffic. The greater part was consigned to *entrepôt* stores at Geneva and Le Locle.[1]

As regards the transport of finished goods, French contracts provided that deliveries should be made either in England, the Ministry bearing the cost of freight from the French port, or at the French port. In Switzerland, delivery was deemed to have been made when the goods were placed on trucks, and a clause in fuse contracts provided that " the completed fuses delivered in trucks shall be transported at buyer's risk, and if lost in transit and they do not reach their destination they shall be considered as having passed the final inspection, and be paid for accordingly."[2] Manufactured articles from Switzerland, in the same way as the raw materials, travelled across France on *bons de transport*. They were consigned to the Assistant Military Forwarding Officer at Havre, and despatched thence to Southampton.

(*c*) Special Arrangements in Switzerland.

As has been seen, a motive for tapping Swiss resources was supplied in the summer of 1915 by the shortage of fuses ; and since the urgency of supply was the only aspect of the Swiss question which interested the Ministry of Munitions, the large orders subsequently placed were similarly in answer to demands which could not be met elsewhere. At the same time, the policy of placing as many orders as possible in Switzerland was strongly supported by the Foreign Office, in the fear lest Germany should turn to account opportunities neglected by the Allies.

In order to preserve Switzerland's neutrality, the Swiss Federal Government could only countenance the manufacture of munitions on condition that there was no discrimination between the belligerents. Moreover, Germany supplied Switzerland with coal, iron and steel, and by threatening to withdraw these supplies could check any undue tendency towards favouring the Allies.

At first, German interference with allied work was confined to attempts to withhold material from firms on her black list. The Allies had a more effective means of control in the *Société Suisse de Surveillance Economique*, which received and allocated rations of materials from allied sources other than those intended for allied munitions.

By the autumn of 1916 British, French and Italian orders in Switzerland had attained considerable magnitude, and Germany insisted on the signing of the German Swiss Agreement, under which the

[1] C.R.V./F/021. [2] C.R.V./S/0237.

Federal Government themselves undertook to see that no German raw material was used for allied munitions.[1]

As the result of the pressure brought to bear by the allied representatives, the Federal Government placed a very elastic interpretation on the terms of the agreement ; and for some months export licences for munitions for the Allies were granted if firms had received from allied sources an amount of material equivalent to that actually used, which might have come from Germany, and this arrangement obviated considerable delays.[2]

The original agreement, however, expired at the end of six months, and it was twice renewed, each time in more stringent terms ; so that from the middle of 1917 onwards firms had to prove that their material had actually been imported from the group of belligerents to which the finished article was sent.[3]

Before there was any question of a German Swiss Agreement, the Ministry had exercised strict control over the large quantities of brass (nearly 28,000 tons in the three years September 1915 to September 1918) which were supplied to Switzerland for British work.[4] In order to obviate the risk of any of this metal finding its way into German hands, Swiss firms were required to give a guarantee that it would only be used for British work. Heavy financial penalties were imposed on breach of this guarantee, which would also automatically cancel the contract. As a further safeguard, a Government inspector had free access to contractor's works to check the use of metal. In some cases arrangements were made for stocktaking on the conclusion of a contract, and surplus metal was purchased by Mr. Sawyer at a fixed price. The scrap obtained in the process of manufacture was reconverted into rod by Swiss foundries, under allied control. The foundries also produced a certain amount of new rod from metal imported into Switzerland through the Ministry organisation, but the greater part of the metal used in fuse contracts was imported in the form of rod from America, or stampings from England.

Most of this metal was received into Mr. Sawyer's stores, and issued thence to contractors as required. The *entrepôt* officials gave a receipt note for all metal received into stock, and it could only be released on a release note issued from the Berne Office. Stocks and balances were checked each month, and contractors and foundries were required to make monthly returns of the metal received, used, and delivered in the shape of finished munitions. A monthly statement was also prepared for the Ministry showing the amount of metal in store, in transit, and delivered to contractors.

This elaborate system of control was not necessary in the case of the steel and iron which had also to be supplied for Swiss firms making machine tools, gauges, etc., since of these materials Germany

[1] C.R.V./Gen./0378. C.R.V./S/069. B.M.2/58.
[2] C.R.V./Gen./0388. [3] C.R.V./G./045. [4] C.R.V./Gen./0388.

had ample supplies. Until the German Swiss Agreement came into force towards the end of 1916, it was only necessary to supply the small quantities of special material, such as high speed steel, which was unobtainable in Switzerland. By the middle of 1917, however, Germany was insisting on strict supervision over the use of metals supplied by her, and Mr. Sawyer found it necessary to press for the maintenance of a stock of steel in Switzerland. The metal was not immediately provided, as further orders for machine tools, for which the bulk of it was required, were not then contemplated; but on the renewal of machine tool orders towards the end of 1917, a small stock of raw steel, in billets, was provided, and was rolled down in Switzerland as needed.

In addition to requirements for Ministry contracts, steel and iron were supplied from England to firms who held orders from other Government Departments, or from British firms. Such supplies were as a rule obtained through the Department or firm concerned, but in specially urgent cases, where Mr. Sawyer was asked to assist, shipment was effected through Ministry channels instead of through the War Trade Department in the normal way. In these "third party shipments" the Ministry accepted no responsibility for insurance against loss en route or for shortage on arrival.

Fuel as well as metal had to be supplied to Switzerland after the German Swiss Agreement had come into force. At the end of 1916, it was arranged that the quantity required should be supplied from stocks in France and subsequently replaced by Great Britain, the advantage of this arrangement being that coke could be supplied to Switzerland from adjoining parts of France, thus saving transport. Under this system, however, Swiss supplies were occasionally held up because of delays in the replacement of French stocks; and after considerable discussion an agreement, known as the *Convention Sawyer*, was made with the French Government, by which fixed quantities of coal and coke were shipped each month to French ports, and there handed over to the French railway authorities, who forwarded the fuel, or its equivalent, to Switzerland.

The Ministry of Munitions was not directly responsible for the carrying out of this arrangement, as the fuel was purchased and shipment arranged by the Ministry of Shipping, in co-operation with the Foreign Office. Supplies were, however, received at French ports by the Ministry agents, who arranged for their transfer to the French authorities. The distribution of the fuel in Switzerland was controlled by Mr. Sawyer, acting in conjunction with the French Government representative, the actual supervision of transit and distribution being in the hands of a French official attached to Mr. Sawyer's office.[1]

Towards the end of 1917, owing to the rapid decline of the Swiss exchange, which resulted in a considerable loss to the Ministry on all payments made in Swiss currency, the Treasury urged that Swiss contracts should be curtailed as far as possible. It was decided that, though fuses might be ordered in France rather than Switzerland,

[1] C.R.V./S/579, 617.

the latter must still provide fuse parts, as well as various other supplies, such as gauges, machine tools, and minor aeronautical supplies, which would altogether involve an expenditure of about £70,000 a week.[1]

The policy of cutting down supplies to the minimum was directly opposed to the Foreign Office policy, and gave rise to apprehension that German orders would increase to a dangerous degree. This fear was not in fact fulfilled, and in May, 1918, when British orders had greatly decreased, firms who solicited renewed German orders were told that Germany took no further interest in the Swiss output.

II. Other Ministry Activities in France.

In addition to Mr. Sawyer's Paris Office, through which fuses and other supplies were obtained, several departments of the Ministry had branch offices in France for liaison or supply purposes. These branches, a brief account of which is given below, negotiated with the appropriate French Government Department for supplies, which were sent to England, or, in some cases, direct to the front.

Throughout the war, also, a certain amount of manufacture and repair of equipment for the British forces was carried out in France under the supervision of the military authorities. With the army workshops proper, the Ministry of Munitions was not directly concerned, but there were a few instances of factories on French soil where work was carried on under the control of the Ministry.

(*a*) Factories Administered by the Ministry of Munitions.

At the beginning of 1916, an extension to a factory at Calais (Usine de Laire) was built and equipped at Ministry expense for filling cylinders with a chemical mixture known as White Star, part of the material for which was produced by the Usine de Laire, and part supplied from England. Filling of cylinders continued at this factory until the end of the war, under the supervision of a representative of the Trench Warfare Supply Department. The labour engaged on filling was British ; civilian workmen, who were first tried, proved unsatisfactory and were replaced by a military working party from the Special Brigade.

In the middle of 1918, the Ministry agreed to take back from the French Government stocks of Mills grenades lying at Gaillon, a French Ammunition Depôt in the Department de l'Eure.[2] It was decided that these grenades should be converted into a later pattern, and the work of rectification was undertaken on the spot, under the control of a Ministry official.

Two other enterprises in which the Ministry were interested, which did not reach the stage of production, were the project for a Gun Carriage Repair Depôt at Creil, and for a Tank Factory at Chateauroux. A factory at Creil was taken over from the French Government at the end of 1917. It was arranged that the Ministry should undertake

[1] C.R.V./S/0398.

[2] See Vol. XI, Pt. I, Ch. II.

equipment and the erection of any new buildings required and should then hand the factory over for working to the Army Ordnance Department, who controlled the other ordnance repair workshops in France. In the spring of 1918, however, communications between Creil and the British front were interrupted by the German advance ; constructional work ceased at the end of March and the scheme was definitely abandoned in May.

In the autumn of 1917, an agreement was concluded between the British and American Governments for the production of tanks in France.[1] A factory was to be erected at Chateauroux, near Bordeaux, capable of a monthly output of at least 300 tanks. The factory was to be under the joint control of an American and a British commissioner, who, early in 1918, handed over responsibility for construction to the Factory Construction Department of the Ministry. Progress was not satisfactory, and in August, 1918, it was suggested that the French Government should undertake the erection of the factory. This proposal was not carried into effect, and some improvement was obtained by the appointment of Messrs. S. Pearson & Sons as construction managers. Production of tanks had not, however, begun at the time of the Armistice.

(*b*) The Optical Munitions Branch.

The Optical Munitions Department opened a Paris Office in September, 1915. In addition to optical glass, numerous French firms were in the summer of 1915 exporting to England optical instruments of various kinds, especially binoculars. The French Government experienced some difficulty in dealing with applications for export permits for these instruments, and asked for the assistance of a British official who could select such as were required by the British Government. The appointment of an official purchasing agent for French optical munitions was approved at the end of August, and a few weeks later Mr. F. C. Dannatt proceeded to Paris to represent the Optical Munitions Department.

His original functions were to deal with all applications for export licences, and to test the instruments submitted ; but before long he became responsible for the actual purchase of instruments, after preliminary inspection.[2] The purchases made by him, which ultimately involved expenditure of about 200,000 frs. a month, fell into three classes—those obtained from the French Government as *cessions*, those purchased direct from French firms for despatch straight to the front, and those purchased from French firms for despatch to England. The first and most important class were obtained through the *Service Géographique* of the *Ministère de la Guerre*, who fixed the price and assumed the entire responsibility for supply, save in the case of binoculars, which were inspected by Mr. Dannatt, owing to lack of French facilities. The contracts placed direct with firms were mainly for small parts of instruments, and the expenditure

[1] See Vol. XII, Pt. III. [2] C.M. 6/Gen./670.

involved was not large.[1] Owing to their fragile nature, most of the optical munitions sent to England were sent direct by boat from Paris, though rail transit was occasionally used for lenses.

Mr. Dannatt was not originally instructed to deal with optical glass, but from the beginning of 1916 applications by the Optical Munitions Department, on behalf of English firms, for permission to export glass from France, were passed through him to the *Service Géographique*.[2]

When Mr. Dannatt was appointed, it was intended that he should be subordinate to Mr. Sawyer, as the principal business representative of the Ministry of Munitions on the continent.[3] The work of the Optical Munitions Branch, however, was carried out quite independently of Mr. Sawyer's Paris Office, save that it was provided with funds from Mr. Durant's account. Mr. Dannatt had full authority to close contracts on behalf of the Optical Munitions Department, who merely notified him of their requirements, and through whom all his communications with the Ministry were made. Mr. Dannatt's office was a small one, and at the beginning of 1918 he had only two assistants.

(*c*) The Inventions Branch.

At the end of 1915 the French Minister of Inventions, M. Painlevé, suggested that in order to secure exchange of information with regard to inventions between the Allies, representatives of England, Belgium, Italy and Russia should be accredited to the French Ministry of Inventions, and that frequent meetings should be held to compare and discuss inventions and experiments. A French representative should also be stationed in London.[4]

Although there was universal agreement as to the need of co-ordination between the Allies in the matter of inventions, M. Painlevé's proposal gave rise to considerable discussion. The exact scope of the organisation which it was proposed to set up in Paris had to be defined, and particular consideration had to be given to the question of naval inventions, since the Admiralty were unwilling to adopt any definite system for the interchange of ideas with other countries.

Finally, in March, 1916, it was decided that an international committee, such as had been proposed by the French Government, should be set up in Paris, to which would be communicated all suggestions relating to land and aerial, but not naval, warfare, which appeared likely to be of value, and for which an application for a patent had been made in the country of origin. The British Government stipulated, however, that secret patents and those of which the publication had been suspended, should not be communicated to the committee, save on the condition that particulars should not be published abroad until publication had been allowed in England.

---

[1] O.M.G./Gen./3477.
[2] O.M.G./Gen./P/4.
[3] C.M. 6/Gen./670.
[4] Hist. Rec /H/700/1.

The British representative selected to serve on this committee, Sir Henry Norman, opened an office in Paris at the end of March, and continued throughout the war to represent the Inventions Department in France, and to act as liaison officer with the French Government on matters relating to inventions.

(*d*) The Chemical Warfare Research Branch.

In May, 1917, Captain Lefebure was appointed liaison officer with the French Government on chemical warfare subjects, and opened an office in Paris. His original function was to facilitate the interchange of information regarding the output, processes, and methods of filling chemical shell, but he subsequently dealt with both research and supply questions.

The Chemical Warfare Branch also kept in close touch with the liaison organisations of the other Allies, particularly with America. The branch was responsible for the arrangements in connection with the constant interchange of small quantities of different types of chemical warfare materials between France, America, and England; especially the exchange of French phosgene for British chlorine and the supply of British cyanide to France. During 1918 a considerable amount of work was done in connection with nitrogen fixation research and production. The supply work undertaken was principally with regard to containers, notably the Livens drum.

At the beginning of 1918, Captain Lefebure became the British representative on the permanent inter-allied secretariat which was established for the collection and distribution of information as to the progress made in chemical warfare research by the various allied services.

(*e*) The Aircraft Production Branch.

French supplies of aircraft, aero-engines and aeronautical materials of various kinds were of very great importance to the British Air Force. Complete aeroplanes and engines, spare parts, and many other articles required for the equipment of the Air Force were sent both to England and direct to the front, while partly manufactured articles were supplied to the Air Force in the field for use in repair shops and depôts. Kite balloons and spares, hydrogen gas in solid and gaseous form and containers were sent to the front and to England.

Before the Ministry of Munitions became responsible for aeronautical supplies, a British Aviation Commission had been established by the Admiralty in Paris to deal with French supplies, and particularly to supervise the large contracts for aero-engines which had been placed with French firms. The Commission, which was composed of military and naval officers, together with technical representatives of the Air Board, was taken over by the Ministry as it stood[1] and was henceforth known as the Department of Aircraft

[1] M.C./314

Production, Paris. Colonel R. P. Cobbold was appointed Director, and at the end of 1917 he was succeeded by Lieut.-Commander E. R. Peale.

Towards the end of 1917 it was found that the position with regard to French aeronautical contracts was not entirely satisfactory. Large advances had been made by the British Government to French firms, some of whom had as yet made no deliveries. Moreover, the prices charged were understood to be higher than those charged to the French Government.[1]

Further investigation was made into the matter, as the result of which it became clear that some improvement in the situation might be expected to follow if the production staff of the Aircraft Production Department were strengthened, so that all firms could be visited more frequently, and if some changes were made in personnel. At the same time, it was felt that a more far-reaching change was required than could be effected by a mere reorganisation of the Aircraft Production Department. The difficulty of reaching a satisfactory settlement with the French Government with regard to prices was thought to be largely due to the fact that negotiations had been in progress only between the Aircraft Production Department and the French Ministry of Aviation. Under the arrangement by which each Paris branch of the Ministry dealt with the corresponding section of the French administration there was no means of bringing pressure to bear on the French Government as a whole, and it was suggested that better results might be obtained if the method of dealing sectionally were abandoned, and the various Paris branches of the Ministry were co-ordinated in a single organisation, through which the more important negotiations with the French Government could be carried out.

III. The Mission Anglaise de l'Armement.

(*a*) The Establishment of the Mission.

At the end of 1917, when the position of French aircraft contracts gave rise to the proposal for the co-ordination of the Ministry's activities in France, there were, as has been seen, four continental branches besides the Aircraft Branch—Mr. Sawyer's organisation for obtaining general supplies from Switzerland and France; the Optical Munitions Branch, under Mr. Dannatt; the Inventions Branch, under Sir Henry Norman; and the Chemical Warfare Research Branch, under Captain Lefebure. A sixth branch was about to come into existence, since there was to be a Paris office in connection with the Mechanical Warfare (Overseas and Allies) Branch, which was set up in November, 1917, to give effect to the agreement between the British and American Governments for the production of tanks in France.

These six branches at the beginning of 1918 came under the general control of Sir Charles Ellis, whom the Minister appointed

[1] M.C./274.

to represent him in Paris, to act as intermediary with the French Government on all questions affecting the interests of the Ministry, and as head of a Mission in which would be co-ordinated all the administrative activities of the Ministry on the continent. The control exercised by Sir Charles Ellis over the various branches was to be elastic in so far as technical and supply matters were concerned, and the branches were to continue to communicate direct with their parent departments at headquarters; but wide diplomatic questions, such as would be likely to arise, for instance, in connection with allied demands for French aeronautical supplies, were to be dealt with by Sir Charles Ellis.[1]

The Mission, of which Sir Charles Ellis was styled President and for which the title of *Mission Anglaise de l'Armement* was decided on, was established in Paris by the middle of January, 1918. Mr. O. C. Allen was appointed Secretary.

(*b*) The Work of the Mission.

The functions of the *Mission Anglaise de l'Armement* were by no means confined to the amalgamation under one chief of the continental branches of the Ministry. One of the principal reasons for the appointment of Sir Charles Ellis was the desirability of having in France an official who would be in a position to compare the supplies given by England to France with those given by France to England, and to decide whether the two countries were, in fact, rendering each other the maximum possible assistance.

The Mission was therefore supplied with particulars of the requirements of both countries. In the case of British requirements, Sir Charles Ellis was responsible for seeing that action was taken to secure supplies by the branch concerned, and for supporting such action with the French Government; while as regards French applications for supplies from England, Sir Charles Ellis was able to gauge their relative urgency and to give them any necessary support.

The Mission kept in close touch with the various inter-allied organisations whose headquarters were in Paris, particularly with the Inter-Allied Munitions Council, on which Sir Charles Ellis took the Minister's place when the latter was unable to attend.

As regards the Mission's co-ordinating functions, the heads of the various branches were assembled from time to time in committee, in order to bring them into touch with one another and keep them informed of general questions affecting their activities. A further step was taken in this direction when at the end of May a building, the *Hôtel de la Perouse*, was found, in which all the branches could have office room.

Shortly after the establishment of the Mission, steps were taken to regularise the procedure in connection with the placing of contracts on the continent. In the case of certain supplies, notably aircraft and optical munitions, requisitions were sometimes made direct on

[1] M.C./314.

the continental branch by the supply department concerned, without the prior sanction of the Contracts Branch having been obtained. Under a procedure decided on in April, the continental branches were not able to commit the Ministry to any financial liability without the authority of the Contracts Branch, and supply departments could therefore no longer requisition direct, save that in cases of extreme urgency supply might be arranged on the authority of Sir Charles Ellis without prior reference to the Contracts Branch.[1]

The supply organisation in Switzerland was not greatly affected by the changes which followed Sir Charles Ellis' appointment, but in France the greater part of the supplies were obtained as *cessions*, formal application being made to the *Ministère de l'Armement* in the name of Sir Charles Ellis. In the case of aircraft supplies, however, the branch had attached to it a French liaison officer, who passed orders to the Service of the French Aviation Department which centralised allied demands.

IV. The Rome Branch.

In February, 1918, a mission, under General Savile, went to Italy to inquire into the Italian explosives position. One of the recommendations made by General Savile on his return to England in March was that a permanent mission of some kind should be established in Rome to look after the interests of the Ministry of Munitions.[2]

The Ministry's relations with Italy were concerned only to a small degree with supplies from that country. Hitherto the department chiefly interested had been the Mechanical Transport Branch, which had obtained motor chassis and motor tyres from three or four Italian firms, the contracts being for the most part placed through London agents. The Explosives Supply Department were in the spring of 1918 getting 7,500 tons of sulphur a month from Italy, but this was by special arrangement with the Italian Government, and all correspondence was carried out through the Foreign Office. Negotiations were also proceeding at this time for the supply of 750 Fiat aeroplane engines, in return for steel plates ; and if a contract were concluded a representative of the Aircraft Supply Department would have to go to Italy, but he would be stationed at Turin, not at Rome.[3]

A Rome branch of the Ministry, therefore, unlike the other continental branches, would be little concerned with the supervision of contracts. It had, however, been felt for some time that there was need of some sort of liaison organisation in connection with the assistance given to Italy, since there was little opportunity of gauging the urgency of demands made by the Italian Government, or of ascertaining that supplies were used to the best advantage. The situation

[1] General Memorandum No. 81 (20/4/18).
[2] Estab. Cent./8/213.
[3] D.M.R.S./410. C.R.V./I/280.

was, moreover, complicated by the difficulty of obtaining from Italy the returns required by the Inter-Allied Statistical Bureau.

The proposal put forward by General Savile was accordingly approved, and it was decided that a small branch of the Ministry should be established in Rome, as part of the Paris organisation under Sir Charles Ellis. The scheme was discussed with the Italian authorities by Sir Charles Ellis in April, but no definite action was taken until the end of May, when Mr. Sawyer, whose work in Switzerland had by this time greatly decreased, was appointed representative of the Ministry in Rome. As he would have to divide his time between Rome and Berne, Colonel Hugh Warrender was appointed second-in-charge, with power to act for Mr. Sawyer.[1]

The new branch came into existence at the beginning of June as part of the *Mission Anglaise de l'Armement*, through which all communications between Rome and headquarters were normally to be made.

The existence of the Rome branch was a brief one. At the end of November, 1918, it was decided that the branch might very speedily be closed, and Sir Charles Ellis went to Rome in the middle of December to wind up the Ministry business. The office was closed at the end of December. This did not, however, entirely terminate the Ministry's activities in Italy. Arrangements for the supply of Fiat aeroplane engines had been concluded at the end of April, and deliveries had not been completed by the end of the year. It was considered necessary to maintain a small office in Turin to supervise the contract until it was completed.[2]

---

[1] Estab. Cent./8/213. [2] M /Demob./191.

APPENDIX

APPENDIX.

Supplies obtained through Mr. Sawyer's Organisation.

(*a*) The Supply of Fuses.

During the three years 1915 to 1918, about 25,500,000 fuses of various types were obtained from Switzerland and 10,500,000 from France.[1]

The fuse first ordered was the No. 100, and the manufacture of this and of its new design, known as No. 101, continued until the middle of 1917. Two Swiss and one French firm undertook it, and the quality of their output was very good, the rejections being, on the whole, the lowest on record.[2] In the latter part of 1916 output was considerably below the contractors' capacity, owing to shortage of metal. The low-water mark was reached in November, when the weekly output was 100,000 compared with capacity for 425,000.

At the beginning of 1916 two Swiss firms undertook the No. 83 fuse, but their first deliveries were delayed until the end of the year from shortage of brass and other causes. Deliveries of this fuse continued until the end of 1917.[3] The No. 80 fuse was also produced by a French firm from the middle of 1916 until 1918.

Fuse No. 106 was obtained in large quantities from a Swiss firm, Piccard Pictet, the first order being placed at the end of 1916.[4] This firm's fuse contract was the principal one running at the end of 1917, when the Treasury insisted on the reduction of Swiss orders.[5] Piccard Pictet's deliveries, though greatly reduced, did not finally cease until May, 1918. A French firm, originally a sub-contractor to Piccard Pictet, with whom a large order for the No. 106 was placed at the end of 1917, continued deliveries until October, 1918.[6]

Fuse parts were obtained in large quantities from a number of small Swiss firms, who had gained experience of the work by sub-contracting to the firms who held orders for complete fuses. The first orders for parts were placed early in 1916, and since it was never found possible to dispense with the Swiss production, work of this nature continued until the Armistice.

---

[1] C.R.V./Gen./0388.
[2] Average rejections during the first year, 3·59 per cent.
[3] 94/F/798, 948, 2297.
[4] 94/F/1318.
[5] C R.V./S/0398.
[6] P.M./F/3935.

(*b*) Other Supplies.

Fuse contracts were responsible for about five-sixths of the total expenditure on supplies obtained through Mr. Sawyer, but they were by no means the only orders for which he was responsible.

From the end of 1915 onwards, large quantities of gauges were obtained, chiefly from Switzerland, where one firm, the Société Genevoise, from the end of 1917 supplied 75 per cent. of their total output to the Ministry. Five or six Swiss firms were called on from time to time for machine tools, though these contracts were not entirely satisfactory, deliveries being frequently behindhand and prices high.[1] Ball bearings were obtained in large quantities from Schmid Roost, of Oerlikon, but in this case contracts were negotiated with the firm's London agents. Optical munitions were obtained both from France, where there was a special office to deal with these supplies, and from Switzerland, where orders were at first placed by the department concerned through a firm of middlemen, and afterwards through Mr. Sawyer.[2] From the end of 1916 contracts were placed in Switzerland for minor aircraft supplies, such as watches, barometers, mechanisms for aircraft instruments, etc. ; and these supplies assumed considerable importance in 1918, when they formed a means of using some of the capacity released by the cutting down of fuse contracts.[3]

A Swiss firm, Paul Ditisheim, supplied friction tubes from the end of 1915 to the middle of 1917, and then accepted a contract for primers.[4] Another firm, the Swiss Berna Company, held a contract with the Ministry for 200 motor lorries, which was arranged in March, 1917, to replace a War Office contract with the same firm, on which deliveries were unsatisfactory.[5] The Swiss Locomotive and Machine Works at the beginning of 1918 accepted an order for 10 locomotives, which was intended to prevent their capacity being used for Germany.[6] No deliveries had been made on this contract when the Armistice was signed.

Switzerland also supplied cellulose acetate, Dr. Dreyfus' Swiss factory, the Société de Cellonit, Bâle, being the sole source of supply until the formation of the British Cellulose and Chemical Manufacturing Company.[7] Swiss supplies of timber were of importance, as they could be forwarded straight to the front.

From France, most of the supplies other than fuses were obtained as *cessions* from the French Government, who in these cases were responsible for the supervision of contracts. About 7,000 tons of glycerine were purchased in this way, 28,000 tons of resin, and 5,000 tons of turpentine, as well as smaller quantities of picric acid and phosphorus. Manufactured articles obtained from France included 75 mm. gun spares, rifle barrels, elastic wheels and brakes for guns, electric tubing, chemical apparatus, acid concentration plants, etc.[8]

---

[1] C.R.V./S/0398.
[2] O.M.G./491.
[3] C.R.V./Gen./0388.
[4] 94/T/435.
[5] 94/MT/1569.
[6] M.C./221.
[7] C.R.V./S/160. A.S./18335/17.
[8] C.R.V./Gen./0388.

INDEX.

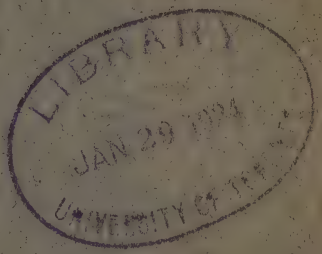
HISTORY OF THE MINISTRY OF MUNITIONS

VOLUME II

GENERAL ORGANISATION FOR MUNITIONS SUPPLY

PART VIII

INTER-ALLIED ORGANISATION



1921

Volume II

GENERAL ORGANISATION FOR MUNITIONS SUPPLY

PART VIII

INTER-ALLIED ORGANISATION

CONTENTS.

CHAPTER I.

Efforts at Co-operation, 1914-1916.

CHAPTER II.

Development of the Principle of Co-operation, 1917-1918.

CHAPTER III.

Supplies from Great Britain to the Allies.

(8724) Wt. 11734/X3801 250 7/21 Harrow G.36

APPENDICES.

CHAPTER I.

EFFORTS AT CO-OPERATION, 1914–1916.

I. Introduction.

Although the need for co-operation between the Allies in the supply of munitions and raw material was continually recognised, no satisfactory system for joint action was evolved during the early years of the war. Theoretically, it was realised that the success of the military operations depended on the pooling of all munitions materials, but national susceptibilities and distrust continually frustrated efforts at complete co-ordination. The pressing needs of one or other of the Allied countries and the shortage of essential materials forced the Allies to act together to meet particular crises, but such organisations as the Commission Internationale de Ravitaillement or the War Office Committee for the Purchase of Russian Supplies, to name two instances, did not do more than touch the edge of the problem. The increasing demands made by their Allies on the resources of Great Britain and France during 1915 forced these two countries to take the lead in systematising the supply of munitions and ending the ruinous competition in the markets of the United States. No one saw more clearly the need for co-ordination than Mr. Lloyd George and M. Albert Thomas, the French Under-Secretary of State for Artillery and Munitions, and they gradually convinced the representatives of other Allied countries who were present at the Munitions Conferences inaugurated by these two ministers, that spasmodic efforts or organisations set up to meet one particular need were totally inadequate. As General Marafini, the head of the Italian Delegation in London, pointed out, the Allies were waging not one war but four wars,[1] and from the munitions point of view they were practically waging internecine war. But, as will be seen below, international jealousies and suspicions neutralised the efforts made at these conferences, and although useful work was done by the organisations that were set up, the realisation of a common munitions policy, like that of a common military policy, was postponed until the last year of the war.

The first efforts at securing inter-Allied action with regard to war supplies may be briefly outlined here.

II. Commission Internationale de Ravitaillement.

The Commission Internationale de Ravitaillement was set up at the very outset of the war, in consequence of the request of the French Government for assistance in obtaining supplies in Great Britain. Delegates from various French Government Departments were then in London, and as a result of several conferences it was resolved to set up

[1] Hist. Rec./R/1010/8.

a joint purchasing organisation with a much wider range of action than had been contemplated in the original request. On 18 August, 1914, therefore, an agreement was signed in London, establishing an Anglo-French Commission on the following conditions :—

The English Government and the French Government are in agreement as to the principle of an *entente* as regards the purchases which the two countries will have to make, for the supplies destined both for their land and sea forces, during the present war.

The English Government, in spite of their earnest desire to give to the French Government, in this matter, as much help as possible, declares the impossibility, on account of the state of the national markets and the importance of their own requirements, of allowing the export of foodstuffs of primary necessity, such as corn, flour, meat and sugar. It declares, also, that for the same reasons it will be useless to attempt to obtain horses in Ireland or Canada.

With this limitation, an Anglo-French Commission is established temporarily in London, which will ensure the practical co-operation desired. Its object will be to prevent the two Governments competing over their purchases in foreign markets and so producing a rise in prices.

The members of the Commission, who will be constantly informed as to the requirements and orders of their respective Governments, will exchange all information in their possession, both as to action taken, or projected, by these Governments, and as to stocks and prices on the markets in question.

This collaboration will not affect the liberty, reserved by each Government, to make directly and independently, such purchases as are necessary. It should be noted that cases may arise, in which the needs of the two Governments are identical, so that it will be to their interests to make common purchases.

The Commission will consist of :—on the French side, representatives of the Ministries of War, Marine and Finance ; on the English side, delegates from the War Office, Admiralty and Board of Trade.

With regard to the payments to be made by the French Government for their purchases, it is proposed to effect them by means of an account, which will be opened by the French Government at the Bank of England, under conditions which have been settled by a special agreement between delegates of the French Ministry of Finance, now in London, and delegates of the English Treasury and the Governor of the Bank of England.

It soon became obvious that as other countries entered the war, similar co-operation in the matter of purchasing war material was needed. The original Anglo-French Commission was expanded into the Commission Internationale de Ravitaillement, on which all the Allies were represented. On 1 September, 1914, the Belgian Govern-

ment nominated a Belgian delegation, and a few days later the Russian delegation was appointed. On 6 November the Serbian Government, and on 17 December the Portuguese Government joined the Commission. The following year, in June, 1915, both the Japanese and Italian Governments appointed delegates. Roumania sent delegates on 27 September, 1916. The United States of America never formally signed the agreement, as the other Allies had done on joining the Commission, but eventually they sent a delegate.

The work of the Commission was to receive all demands for supplies put forward by the different Allied countries. These requirements were of two classes : (1) direct Government requirements of munitions of war, military and naval equipment and materials and machinery for their manufacture, and (2) requirements of Government contractors in Allied countries, which consisted chiefly of machinery and raw materials. The first class formed the main work of the Commission. The requirements were examined by the British executive staff, who obtained any further information which they considered necessary, and then brought them before the British Government Departments for advice as to the best means of obtaining the requirements in question, " considered from the point of view of labour, plant, material, tonnage and finance." The contract was then placed either by a British Government Department on behalf of the Allied Government, or the delegates on the Commission were advised as to the country and firm where the contract might be placed.[1]

With the rapid expansion of the Commission, the executive work was correspondingly increased and was undertaken by the Exhibitions Branch of the Board of Trade, while on the British side of the Commission representatives of the Foreign Office, Ministry of Munitions, Board of Agriculture and Committee of Imperial Defence were afterwards included.

Demands for munitions were sent direct to the War Office and Admiralty, where a special official was appointed to deal with the Allied requirements put forward by the Commission.[2] This procedure was continued in cases where it was decided to meet an Allied demand out of British stocks of munitions, but, on the formation of the Ministry of Munitions, requirements for raw materials or for munitions not yet manufactured were referred to the new Department. Mr. G. M. Booth, Deputy Director-General (B) was appointed as the representative of the Ministry on the Commission and he was responsible for seeing that Allied requirements referred to the Ministry were met so far as was possible. In February, 1916, a Registry Section of the Commission Internationale de Ravitaillement was established at the Ministry to act as a clearing house for applications from the Commission. In spite of this, the machinery proved somewhat cumbersome, and in 1917 the relations between the Commission and the Ministry were revised.[3]

---

[1] HIST. REC./R/1010/5.
[2] HIST. REC./R/1010/29.
[3] HIST. REC./R/1010/1.

In the matter of munitions, one important modification in the functions of the Commission was made by verbal agreement between Mr. Lloyd George and M. Thomas at the Calais Conference in July, 1915, when it was decided that the demands of the French Ministry of Munitions should be forwarded direct by its representatives in England to the British Ministry and not pass through the Commission Internationale de Ravitaillement.[1]

The transport of Allied munitions and materials was carried out under the direction of the Commission, working in close touch with the Admiralty Transport Department, the Board of Trade, the Ship Licensing Committee and the Shipping Control Committee. From this intimate knowledge of the Allies' transport requirements, the Commission was enabled to make economies in the use of tonnage for the transport of munitions. Thus the ships carrying coal to Italy brought back iron ore from Mediterranean and Spanish ports, and French steel was conveyed from Great Britain in ships which carried hay for the British War Office on their return voyage.

It should be noticed that one of the clauses in the agreement for setting up the original Anglo-French Commission reserved to each Government the liberty of making purchases independently. This reservation, although obviously necessary at this early stage, weakened the authority of the Commission and there are many instances of orders for munitions being placed independently of it. In the course of time the fact that the Commission was attached to the Board of Trade led to its organisation being frequently ignored by the Ministry of Munitions, especially when the supply departments of the latter developed into powerful organisations. This attitude was encouraged by the fact that the French Ministry of Munitions already acted independently of the Commission, and many of the suggestions for further inter-Allied co-operation in purchasing supplies which were at various times put forward ignored the existence of the Commission. The strength of the latter, however, lay in its financial powers. Except in the case of France, it was entrusted by the Treasury with the duty of ascertaining whether any order to be placed on behalf of an Allied Government and chargeable in the first place to British funds, was in accordance with the financial arrangements made with the various Allied Governments and whether British credits were available to meet the order.[2] Any independent action in this respect on the part of a supply department immediately created financial confusion and was sternly discouraged by the Treasury. At times, however, in order to avoid international friction, the Commission was forced to obtain Treasury sanction for an order which had already been placed.[3] The work of the British staff of the Commission Internationale de Ravitaillement was "to formulate Allied demands and lay them before the British departments concerned, to ensure that all

[1] HIST. REC./R/1010/1.
[2] Letter from Treasury to Ministry of Munitions, 29 September, 1916 (C.R. 0347).
[3] HIST. REC./R/1010/29.

interested parties were consulted, and to see that the demands received the consideration to which they might be entitled," and if necessary appeal to the War Cabinet, the advocacy of a quasi-impartial body being useful in the equitable division of supplies.

III. Purchasing Organisation in the United States of America.

On 15 January, 1915, the War Office, finding itself forced to purchase large supplies of munitions in the United States, appointed the firm of Messrs. J. P. Morgan & Company, New York, to act as Commercial Agents of the British Government in the States.[1] All British contracts for military equipment and munitions were placed by the firm, who established a large organisation covering the placing and supervision of contracts and export arrangements.[2] Technical inspection was carried out under a military commission which, however, worked in close touch with Messrs. Morgan. Shortly after their appointment as the British agents, negotiations were opened for their appointment as agents for the French and Russian Governments, presumably as a corollary of the Financial Conference at Paris in February, 1915.

Neither the agreement then made with the firm nor the broader negotiations for a scheme of joint purchasing materialised, but the French Government later reopened negotiations with Messrs. Morgan, and on 4 May, 1915, informed the British Government that the firm had been appointed the French Government agents in the United States.[3] This arrangement, although it fell far short of a joint purchasing scheme, in practice worked well, and through Messrs. Morgan the British Government was kept informed of French purchases in the States, while the agents were able to prevent any open competition between the two Allies on the American market. The Russian Government never appointed Messrs. Morgan as their agents, but as a large number of contracts were made on behalf of Russia by the British Government through Messrs. Morgan, a certain amount of competition was eliminated. Both Italy and Belgium purchased munitions in the United States through their own commissions in New York, with unfortunate results. It was agreed, however, in February, 1916, that offers of munitions materials received by the Italian and Belgian Commissions in London from American firms or their representatives in Great Britain, were to be referred to Messrs. J. P. Morgan & Company.[4]

The acute competition for munitions metals, however, made closer contact necessary. In the summer of 1916, both France and Great Britain were forced to obtain increasing supplies of shell steel in the United States of America, and at a conference held in London in July, General Dall'Olio, the Italian Minister of Munitions, asked for large supplies of shell steel and pig-iron. It was impossible to meet his requirements in Great Britain, and the Ministry of Munitions offered to try to obtain supplies for him in America. The Italian Minister was unwilling that any restriction should be placed on his purchasing

[1] HIST. REC./H/1141/3.
[2] For details of this see Vol. II, Part III, Chap. II.
[3] Vol. II, Part III, Chap. II.
[4] D.D.G. (B) 199.

activities in America, but the position of the British Ministry in urging joint buying was strengthened by the fact that Italy was simultaneously seeking financial assistance from Great Britain.[1] It was agreed that Messrs. J. P. Morgan & Company should try to obtain offers for 25,000 tons of shell steel a month up to the end of April, 1917, on behalf of the Italian Government,[2] but this did not prevent the Italian Purchasihg Mission in the States from acting independently.[3] The position grew more and more serious, and on 2 October, Messrs. Morgan urged that a thorough investigation of the steel situation should be made by the technical representatives of France, Great Britain and Italy in the United States, in order that a plan of procedure might be evolved for obtaining the best possible supplies, which would then be allotted amongst the three Governments in such proportions as should be fixed by the authorities in London.[4]

A conference on these lines met on 19 October, 1916, and the representatives agreed that there was a steel famine which menaced deliveries early in 1917, and that the closest co-operation was necessary between the representatives of the Allied Governments in the negotiations for all kinds of steel. The British Ministry of Munitions promised to support the New York conference by securing joint action in London so far as possible, and urged that further investigations should be made in the States.[5] More definite co-operation was attained between France and Great Britain by the establishment of the Inter-Allied Munitions Bureau in London[6] and a permanent conference was established at New York consisting of Colonel Vignal, Mr. (later Sir Henry) Japp and Mr. Stettinius, the latter representing Messrs. J. P. Morgan & Company, to co-operate with the London organisation. The Italian Government did not join the Bureau for some months, so that the Italian Mission in New York was not represented on the conference, although the latter dealt with the orders placed through Messrs. Morgan on behalf of Italy. Attached to the conference were advisory committees dealing with specific materials, consisting of members of the Allied Missions, who had special knowledge of the different materials controlled by the Inter-Allied Munitions Bureau.[7]

Special arrangements were made for joint purchasing of copper by the British and French Governments. The Ministry of Munitions proposed in July, 1916, that it should undertake all purchases of copper on behalf of France and Great Britain. With the consent of M. Thomas, this proposal was carried out informally until November, 1916, when a definite agreement was reached. All copper was controlled from this time by an Order under the Defence of the Realm Act, and in December purchases for the Allied Governments were entrusted to a committee formed from the metal merchants on the London Metal Exchange.[8]

IV. Anglo-Russian Committees.

Russian competition was the most serious of all these inter-Allied problems. Russia was badly handicapped in the matter of munitions.

[1] HIST. REC./R/1012/1.
[2] C.R. 4506.
[3] C.R. 4507.
[4] C.R. 4506.
[5] C.R. 4508.
[6] See below, p. 24.
[7] C.R. 4508.
[8] C.R. 4633; see also Vol. VII, Part III.

For the last ten years before the outbreak of war, she had followed the policy of not placing any orders with private armament firms, while the production of ammunition in the government workshops had been reduced to the requirements needed for practice firing. Practically no heavy artillery was made by Russia herself.[1] She was immediately forced to obtain supplies in Allied or neutral markets, but encountered great difficulties owing to her lack of credit in foreign countries and her inexperience in buying in the American market. This was accentuated by bad organisation in the Government Departments, which led to endless delays, as her representatives abroad appear to have been allowed very little liberty of action and had continually to refer questions to their home Government for settlement. Early in 1915, the British Government, besides the financial assistance promised at the Paris conference in February, offered their services in placing orders on behalf of Russia in the United States of America,[2] and obtained through Messrs. J. P. Morgan & Company several satisfactory offers for the supply of Russian material. The Russian Government, however, refused these[3] and placed one big order for 5,000,000 3-in. shell with a certain company against the advice of the War Office.[4] The conditions of this contract were thoroughly unsatisfactory and caused endless trouble in Canada and the United States. The Russian attitude was,however, completely inconsistent, for insistent appeals for help were made to the War Office by the Russian delegation in London all through the spring of 1915. Finally, in May, 1915, Lord Kitchener sent Colonel (afterwards General) Ellershaw on a special mission to Russia to find out the true state of affairs. He carried a letter from Lord Kitchener to the Grand Duke Nicholas showing that the Russian shortage of shell amounted to at least 1,500,000 rounds a month. The Grand Duke, in reply, gave Lord Kitchener full powers to place on behalf of the Russian Government large orders for shell, small arms ammunition, machine guns and rifles.[5]

Although the date of this letter, 6 June, 1915, and General Ellershaw's return from Russia coincided with the formation of the Ministry of Munitions, Lord Kitchener decided that as the commission was the result of his personal intervention with the Russian Commander-in-Chief, the supply of Russian munitions must be undertaken by a special organisation under his control. He, therefore, in June, 1915, established the War Office Committee for the Purchase of Russian Supplies, consisting of :—[6]

Mr. U. F. Wintour	Director of Army Contracts.
General Sir E. Hermonius	Members of the Russian Supply Commission in London.
Colonel Belaiew	
M. de Routkowsky	
General Ellershaw	
Mr. G. M. Booth	Ministry of Munitions.
Sir E. Wyldbore Smith	Director of the Commission Internationale de Ravitaillement.

[1] HIST. REC./R/1701/3.
[2] HIST. REC./R/1013/15.
[3] HIST. REC./H/1141/3 ; R.S.C./Gen./35.
[4] HIST. REC./R/1013/15.
[5] *Ibid.*
[6] *Ibid.*

The Committee considered the possibility of supplying the Russian requirements in Great Britain, but the greater part of the orders for early delivery had to be placed in the United States of America, and were financed by the British Treasury. It was decided that the organisation of Messrs. J. P. Morgan & Company should be utilised; that all Russian contracts placed by the Committee in the name of the British Government should be signed by Messrs. Morgan for financial reasons, but that technical inspection should be carried out by the inspectors attached to the Russian Commission already in New York.[1]

The necessary financial agreement was drawn up and signed early in July,[2] but in the meantime the Committee had examined the offers obtained by Messrs. Morgan and contracts were placed for munitions and explosives at an estimated expenditure of over £44,000,000 up to December, 1915. By the middle of August the expenditure approximated £70,000,000 and further supplies were still required by Russia.[3] The credits already put at the disposal of the Russian Government were not sufficient, and on 30 September, 1915, a new Financial Agreement was signed by M. Bark, the Russian Minister of Finance, who was then in London. Besides the immediate financial arrangements clauses to enable the British Government to exercise a much closer control over the Russian purchases were inserted as follows :—

(1) All proposals for purchases on Russian account, whether in the British Empire or in the United States of America, were in future to be examined in London.

(2) The Russian Government was to appoint in London experts with full power to sign contracts in the name of the Russian Government.

(3) The British Government was to place at the disposal of the Russian representatives information as to sources of supply and prices, and was to give all assistance in its power.

(4) The Russian Government was to arrange that no contract should be made in the British Empire or America without their accredited representatives in London having cognisance of the main conditions and that, so far as possible, all such contracts should be negotiated and signed by the Russian representatives.

(5) No purchases on Russian account, for which payment was to be made from credits furnished by the British Government, were to be made without the formal authorisation of a competent agent appointed by the Russian Government in London, acting in consultation with the competent authority appointed by the British Government.

(6) Purchases of war material were to be made by the duly authorised representatives of the Russian Government, acting in consultation with the committee already appointed by Lord Kitchener at the War Office.

---

[1] HIST. REC./R/1013/15. [2] R.S.C./Gen./93. [3] *Ibid.*

(7) Purchases of all other materials were to be made in like manner by appointed representatives of the Russian Government on the Commission Internationale de Ravitaillement, acting in consultation with the representatives on that body of the various British Government Departments.[1]

The experience of the War Office Committee in working conjointly with the Russians had shown conclusively the need for these conditions, but in Russia the new agreement was criticised as involving restrictions humiliating to a Great Power and M. Bark was blamed by his colleagues for consenting to such close supervision. Continual representations in this sense were made through the British Ambassador at Petrograd and a certain number of minor concessions were made, which made for smoother working and in the case of small contracts lessened the delays which resulted from the close control. The fact remained, however, that co-operation with Russia was extremely difficult. Endless delays took place in obtaining the list of the contracts placed by the Russians in the United States of America before the date of this agreement, which were to undergo revision if possible; drawings and specifications were not sent when promised and when they arrived were found to be extremely rigid and difficult for the inexperienced American firms to work from. From the first, the Director of Army Contracts explained that alterations in the specifications would be necessary if American contractors were to take up Russian orders, and that the Grand Duke Nicholas desired that provided efficient results could be obtained, rigid adherence to specification on matters of detail should not be insisted on. General Hermonius accepted this view, and sent out various instructions to the Russian technical staff in the United States.[2]

But the real difficulty does not seem to have arisen in the relations of the War Office Committee and the Russian Delegation under General Hermonius in London, but to have been due to the Russian Commission in New York, under General Sapojnikoff, and still more to the Russian inspecting staff. Probably the New York Commission resented any interference with their freedom of action in the United States and disliked working with Messrs. Morgan, while the inspecting staff seem to have done all that was possible to hinder rather than help the American manufacturers. The contracts by the end of 1915 were considerably in arrears and if this was partly due to the firms having overestimated their capacity for the production of munitions, the relations between them and the Russian officials were so strained by autocratic methods of inspection, changes in specification, and disagreement on financial questions, that the manufacture of munitions under Russian contracts, whether placed direct by the Russian Government or through Messrs. Morgan, was almost at a standstill.[3] Generals Ellershaw and Hermonius both visited the United States, and effected some improvement in the situation and in February, 1916, General Hermonius on his return from a second visit reported

[1] R.S.C./Gen./94. [2] R.S.C./Gen./33. [3] *Ibid.*

that he hoped deliveries would not be so long delayed as had been feared.[1] Such visits, however, did not effect a permanent improvement in the relations of the purchasing organisations in the United States, and after consultation with the Russian Government, it was decided that General Ellershaw should be appointed as the permanent representative of the British War Office on the Russian Commission in New York. A new head of the Russian inspecting staff was also appointed and it was hoped that these measures would improve the American situation.[2]

Before General Ellershaw could take up his appointment, however, he set out with Lord Kitchener on a mission to Russia, and the tragedy of the loss of H.M.S. Hampshire altered the whole position. The Army Council decided that as the special reason for the existence of the War Office Committee no longer existed, it would be best, in order to attain complete co-ordination of all munitions purchases, to transfer the Russian work to the Ministry of Munitions.[3] There was no doubt that the existence of the War Office Committee weakened the control exercised by the Commission Internationale de Ravitaillement over all the requirements for war purposes of the Allied countries, and the Ministry proposed to make new arrangements which should restore this control.[4] In practice, it appeared that the Russian members of the War Office Committee had concluded contracts before they were presented to the committee, whose endorsement thus became a pure formality, while the independent action of the Russian Commission in New York led to definite competition with Great Britain in the American market.[5] A departmental committee was formed, called the Ministry of Munitions Russian Supplies Committee, consisting of representatives of the Ministry, War Office, Commission Internationale de Ravitaillement and Treasury, while the executive work was carried on by the Russian Supplies Section of the Ministry.[6]

A new agreement with Russia was signed on 14 July, 1916, which provided for British control of the contracts already placed on behalf of Russia and of any new orders that might be required to be paid for out of British credits. With regard to the old orders, a special Anglo-Russian Sub-Committee was to be formed in New York consisting of the president and one other member of the Russian Supplies Commission and two representatives of the British Government, the latter having only one vote. This sub-committee was to have supreme control of all matters relating to the contracts already placed by the British Government on behalf of Russia in the United States and of the direct Russian contract for 3-in. shell. All new orders to be paid for out of British credits in the United States were to be placed by the Russian Supplies Commission in New York, to which two British representatives were to be appointed; no orders were to be placed until it had been ascertained in London that the material could not be obtained in Great Britain or Canada

[1] R.S.C./Gen./33.
[2] R.S.C./Gen./112, 94.
[3] C.R. 2056.
[4] C.R. 2056.
[5] Hist. Rec./H/1000/3; Hist. Rec./R/1411/3.
[6] D.D.G.(B) 74.

and the Commission was to employ Messrs. J. P. Morgan & Company for negotiations with contractors. The Russian Government also agreed not to open negotiations for orders in the United States without the approval of their London Commission.[1] These arrangements for controlling the new orders were later somewhat relaxed in favour of the Russian Commission in London.[2] Throughout the rest of 1916 and during 1917 the British section of the Anglo-Russian sub-committee struggled to obtain satisfactory revision of the old contracts and to secure delivery of the munitions ordered, but the business was not finally wound up at the time that Russia withdrew from the war.[3]

In addition to the financial and other assistance given by both France and Great Britain to Russia, great efforts had been made to supply her with heavy artillery, rifles and ammunition from existing supplies or from their own factories,[4] but at the end of the open season in 1915, it was reported that valuable stores had been lying for months in the open, and unless the whole system was reorganised matters would become worse, since the storehouses were full of hay and flax which should have been shipped to England and France and incoming ships were still unloading. The early and severe winter increased the difficulties and the Admiralty became far more concerned that their transport should not be caught by the ice, than that the Russian munitions should be unloaded.[5] In 1916, the action of the Treasury in sanctioning the expenditure of further sums on munitions and other war material was largely influenced by the extreme shortage of freight[6] and the hopeless congestion that had arisen at Archangel and on the Russian railways.

With the appointment of M. Trepoff as Minister of Communications, a great effort was made to improve the Russian railway system; he asked for a free hand in purchasing the necessary materials, and early in the year began negotiations in America for rails and wagons of a total value of $28,000,000, while further requirements were estimated at £6,000,000. At the beginning of May, 1916, the Russian Government agreed that all orders should be placed by the British Government in America through Messrs. J. P. Morgan & Company. On 10 May, the Ministry of Munitions pointed out that the sudden placing of these orders in the United States and elsewhere would upset the railway materials market, and urged that M. Trepoff should allow his requirements to be dealt with by the new supply department which was being set up by the Ministry to co-ordinate the Allies' demands for railway materials. In June the total requirements had reached the value of nearly £39,000,000.[7]

---

[1] D.D.G.(B). 98.
[2] D.D.G.(B). 104.
[3] D.D.G.(B). 106.
[4] Letter from M. Thomas to Mr. Lloyd George, 16 November, 1915; HIST. REC./R/1201/3, 1013/13.
[5] R.S.C./Gen./168, 65.
[6] R.S.C./Gen./33.
[7] C.R.V./R/05.

No more than £5,000,000, of this could possibly be shipped owing to the existing shortage of freight, while the Treasury said that there were no credits available even for this amount.

A conference at the Ministry was held on 13 July, 1916, to discuss Russian requirements in general, at which Lord Curzon stated that the limiting factor in any help given to Russia was the ability of the Russian railways to handle the cargoes landed.[1] Even while the Ministry was considering M. Trepoff's memorandum it was rumoured that the Russian Government, in spite of the agreement of 3 May, had ordered rails in America, without even informing her representatives in London.[2] M. Thomas, who was present at the conference, was able to seize on this incident to point out the necessity for the establishment of the Inter-Allied Munitions Bureau.[3] The Russians still continued to act separately and the British Treasury refused to take any responsibility for finance or shipment of the materials.[4] The Russian Railway Department was described to the British Ambassador as "excessively undisciplined," while the Russian Commission continued buying, placing contracts with unreliable firms, and by October the whole position was one of the greatest confusion.[5] The fact remained, however, that under M. Trepoff's administration, the Murman railway was completed, contrary to all expectations, by 17 November, 1916.[6] The question of shipping facilities exercised a growing influence over the matter of Russian supplies, and with the establishment in 1917 of a Cabinet Committee under the chairmanship of Lord Milner,[7] representing the Controller of Shipping, War Office, Treasury, Ministry of Munitions and Commission Internationale de Ravitaillement, the work of the Ministry of Munitions Russian Supplies Committee practically came to an end. The new committee had executive powers and sufficient information to enable it to determine the policy to be pursued in respect of Russian requirements as a whole, and Mr. Benson, Acting Deputy Director General (B), recommended on 2 April, 1917, that the Ministry of Munitions Committee should be dissolved and the Russian Supplies Section made directly responsible to Lord Milner's Committee. No action was taken, but the Ministry of Munitions Committee shortly afterwards ceased to meet.[8]

V. War Office High Explosives Committee.

In January, 1915, Lord Kitchener established a Committee for the Supply of Explosives to the Allies. He had found a certain confusion in the minds of the Allied delegates on the Commission Internationale de Ravitaillement in regard to the policy of the British authorities as to the export of high explosives or raw material for their manufacture, and there was also some doubt as to the right procedure to be followed by the Allies in order to obtain supplies of explosives from Great Britain.

---

[1] C.R.4502.
[2] R.S.C./Gen./16.
[3] C.R.4502.
[4] R.S.C./Gen./1
[5] C.R. 4502.
[6] C.R. 4503.
[7] See below, p. 24.
[8] D.D.G.(B)74.

The object of the Committee, over which Lord Kitchener himself intended to preside, was to consider how far it was possible to assist the Allies from the resources at the disposal of Great Britain and in what proportion any available supplies should be distributed amongst the Allied countries. Lord Moulton and the Director of Army Contracts, who also represented the War Office on the Commission Internationale de Ravitaillement, were members of the Committee. The first meeting was held on 11 January, 1915, when besides the British members, a French delegate was present. Russia was first represented in February and Belgium and Italy in June, 1915. After several meetings Lord Kitchener drew up a plan of procedure, which was finally approved in October, 1915.

(1) All negotiations between Allied Governments for high explosives and raw materials therefor were to be conducted by duly accredited representatives of the Government acting in consultation with Lord Moulton and the Director of the Commission Internationale.

(2) Applications from Allied Governments for the export of explosives from Great Britain were to be made in the first instance to the Director of the Commission Internationale, who referred them to Lord Moulton for the observations of his department and submitted them to the Secretary of State for War. In urgent cases the latter was empowered to give an immediate decision, but otherwise all applications for export were considered by the Committee.

(3) All decisions of the Committee were to be passed to the High Explosives Department for the necessary action and to the Commission Internationale as the authority for the issue of the permit to export.[1]

During the first months of the Committee's activity, it appeared that no notification of the allocations made reached the finance sections of the departments concerned and that Treasury sanction had not been obtained in every case. In September, however, this was rectified; arrangements being made to inform the finance section of the Commission Internationale of each application made, so that the necessary financial sanction could be obtained. A slightly more complicated arrangement was made in the case of allocations to Russia.[2] After the death of Lord Kitchener, the Explosives Committee did not meet for more than four months, and in September, 1916, it finally ceased to meet altogether. Its functions were continued by the Department of Explosives Supply, to which all requisitions, etc., were passed on from the Commission Internationale, through the Director of Munitions Requirements and Statistics.[3]

---

[1] HIST. REC./R/1501/1.
[2] R.S.C./Gen./16.
[3] HIST. REC./R/1501/1.

VI. Inter-Allied Conferences in 1915 and 1916.

The growth of the principle of inter-Allied unity was stimulated by the policy of Mr. Lloyd George, who showed a great preference for the method of conferences between representatives of the principal Allies. The work of the most important of these conferences will be briefly referred to here. The first step to obtain a united policy between the Allies was taken from the financial side at a conference held at Paris in February, 1915, between Mr. Lloyd George, then Chancellor of the Exchequer, M. Ribot and M. Bark, respectively the Ministers of Finance of France and Russia. It was then agreed that these three countries should unite their financial resources and adopt the principle that each should contribute proportionately to loans made to the smaller States of the Alliance. By another clause in the agreement, Great Britain and France each placed a credit of £25,000,000 at the disposal of Russia, in order to finance her purchases of war material in Allied and neutral countries.[1] As a result Great Britain became closely interested in Russian munitions contracts, and the special joint organisation already referred to was set up both in Great Britain and in the United States of America, while, as has been seen, in order to minimise the competition in the American market, France and Great Britain both appointed the same firm as their buying agents in New York.

But even so, the need for much closer contact was obvious. Early in 1915 Great Britain, France, Belgium and Russia were all competing in the American market, and naturally American contractors played them off one against another. Thus while Great Britain was negotiating for a supply of T.N.T., Belgium stepped in and bought it at a price higher than that at which the War Office were hesitating to accept it. All the Allies competed for Messrs. Dupont de Nemours' supply of explosives, but the British War Office withdrew when they found the firm was playing them off against the Russian Government, who were negotiating through Messrs. Vickers. The British Government agents, Messrs. J. P. Morgan & Company, attributed the rise in price of picric acid to the negotiations of the French Government, while in April the whole American metal and machinery market was "violently deranged" by purchases by a company which held large contracts with the Russian Government.[2] There was also practically no efficient system for controlling purchases made in Allied countries, and even in Great Britain, where contracts placed by Allied Governments for munitions were supervised by the War Office, other Departments acted independently. France, who had large contracts for coke in Great Britain, found that export licences were difficult to obtain, while on her side, for instance, she suddenly stopped the export of ferro-silicon, at a time when she was urgently demanding shell steel from Great Britain.[3] Similar instances of lack of co-ordination and uneconomical competition could be found on all sides.

On the formation of the Ministry of Munitions, Mr. Lloyd George was able to extend his policy of co-operation between the Allies to

[1] HIST. REC./R/1013/15. [2] HIST. REC./H/1141/4, p. 16.
[3] HIST. REC./R/1810/18.

munitions supplies. In June, 1915, a conference was held at Boulogne, between representatives of the British Ministry of Munitions and the military authorities and M. Albert Thomas, the French Minister of Munitions and French military representatives. This was the first of a long series of conferences in which the British and French Ministries fought against international suspicion. The Boulogne Conference was of outstanding importance as between France and Great Britain, and as a result of it the programme of the newly-formed Ministry was shaped in consultation with the French and in the light of the experience gained on the French front. In addition to discussion of the requirements and output of guns and ammunition, and the merits of different types, information was exchanged as to manufacturing details, and the question of international organisation was raised by M. Thomas. He pointed out the need for Allied co-operation in purchases in neutral countries and suggested periodical conferences between his representative in England and the Ministry of Munitions.[1]

The advantages of personal discussion over correspondence were so manifest after the Boulogne Conference that it was followed by a long series of conferences between the French and British Ministers of Munitions and by special missions to France and England of technical experts to discuss particular points. Mr. Lloyd George and M. Thomas met in conference at Calais on 7 July, 1915, when, in addition to discussing immediate problems of supply, in pursuance of M. Thomas' suggestion at Boulogne, very close contact was established between French delegates from the Munitions Department and the British Ministry. M. Dhavernay, who had been appointed by M. Thomas to report on French contracts in the United States of America, was also directed to work in co-operation with the British mission under Mr. D. A. Thomas (later Lord Rhondda), which was carrying out similar work on behalf of Great Britain.

Some of the demands put forward by M. Thomas were of necessity negatived by Mr. Lloyd George, but on certain points he was able to promise help. He agreed to help Messrs. Vickers to obtain additional machine tools for their Crayford plant, the bulk of which had been supplied by the French Government, and to allow the firm to complete the French order for 2,000 machine guns before making any deliveries from the Crayford works to the British Government. He also promised to press the firms making shell steel to conform with the French requirements, while the Admiralty agreed to share equally with the French Government the quick-firing rifles produced by the Hotchkiss Gun Company. Negotiations as to the manufacture of fuses in Switzerland, one of the points mentioned at the Boulogne Conference,[2] were continued, and an arrangement was made by which the British Government should place orders for fuses in Switzerland and take the surplus fuse production of the French Government.[3]

---

[1] The official report of the conference is given in Appendix I.
[2] See Appendix I.
[3] Hist. Rec./H/1000/3; Hist. Rec./R/1011/2.

The carrying out of the Boulogne programme involved a further conference with M. Thomas and various French munitions specialists on 4, 5, and 6 October. The policy of close co-operation with France had found firm supporters amongst the officials of the British Ministry, and at a preliminary departmental discussion with regard to the business at the forthcoming conference, it was agreed that the following principle should, if possible, govern the conversations :—

> "That where either England or France possessed a surplus beyond its own war requirements, required by the other for war purposes, such supplies should be freely accessible to the other country without any question of a *quid pro quo*."[1]

At the conference itself both sides urged that detailed information as to the requirements of their Ally should be sent some time ahead, and M. Thomas was especially insistent that, as all munitions and manufacture of munitions were controlled by his Government, in future notes concerning all requirements should be sent to the French Government. Independent buying on the part of either the French or British Governments or by private firms should be discouraged. He was emphatic on the necessity of joint action :—

> "I do not consider the Ministry of Munitions in London or my own office in Paris to be two separate institutions. I consider there is one Munitions Ministry for both countries. It is necessary to find how it is possible to use the resources of both countries to the common advantage of both countries. If a comparison is made between the present needs of Russia and France, for instance, although nobody doubts that the needs of Russia have very seriously to be considered, the fact that France is much more ready to do something immediately they have the means of doing it, and that so much had been ordered in manufactories, where only perhaps a few machines and tools are necessary for completing the work, it is difficult to put Russia and France on the same plane."[2]

The October conference brought out the need not only of co-operation between the Allies on the French front, but also with Russia, Serbia, and Italy. Both France and Great Britain were receiving heavy demands from Russia, especially for artillery, transport and machinery, which were far beyond the capacity of either Ally to meet for a considerable period. It was obvious, as M. Thomas pointed out, that it was necessary to have some check on the comparative urgency of the demands of the different Allies and to be protected against the duplication of demands. The next step was therefore the summoning in London of the "Big-Four" Conference in November, 1915, at which France, Russia, Italy and Great Britain were represented. Plenary meetings of the delegates of the four countries met to discuss the general principles governing the supply of munitions, but the particular questions which had come up for decision were largely

[1] Hist. Rec./R/1011/2.
[2] Hist. Rec./R/1011/3 ; D.D.G.(B). 1943.

decided by small groups, into which the conference divided, formed of the delegates and specialists of two or three Powers concerned in the immediate questions, such as machine tools, platinum, guns, etc. On the general question of policy, M. Thomas again urged the need of bringing plans and requirements forward in good time. He suggested the establishment of a central body to receive all the requirements of the different Allies as regards munitions, to scrutinise them and finally pass on the list, amended if necessary, to the supply departments of the country which could best supply the goods required. He suggested the formation of a Central Munitions Office, with the following constitution and powers :—

"A Central Munitions Office for the Allied States is set up, to consist of one representative of each of the Allied countries.

Within one month each State shall forward to the Central Office the following information, drawn up in accordance with a uniform table of questions :—

(1) Its construction programme (guns of different types, ammunition, trench engines, rifles, cartridges) and the anticipated dates of delivery.

(2) A statement of orders placed or work in hand at home, and a statement of orders placed abroad to carry out the programme, together with an estimate of probable deliveries.

(3) The quantities of raw materials, machinery or labour which each Ally can command, either for its own supplies or for placing at the disposal of the other Allies.

These statements shall be revised monthly, and communicated by the Central Office to the Ministry of Munitions and the Headquarters Staff of each State.

In order to be able to make the best use of the joint resources of the Allies, every new programme shall be accompanied by a report which shall enable the urgency and importance of requirements to be measured.

The Central Office shall draw up for every neutral country a statement of orders placed by the Allies, and shall communicate it to the several missions entrusted with purchases in neutral countries. It may further prepare an indication of the resources offered by those countries.

An International Conference of the Ministers of Munitions of the Allied countries or their representatives shall be held every two months. Representatives of the Headquarters Staff shall be present at this Conference."

This proposal was approved by all the delegations, but the Italian delegate, General Marafini, only signed the resolution subject to the approval of the Italian Government, as he had no express authorisation to sign such a resolution. Further resolutions were

also proposed by M. Thomas to regulate purchasing among the Allies themselves :—

> " Every order for goods of which the export is prohibited by the respective Governments shall pass officially from one Government to another Government. It shall be carried out under the supervision of the Government which has undertaken it on behalf of its ally, whether it
>
> (1) executes the order itself or places it with manufacturers, or ;
>
> (2) ratifies individual contracts placed with manufacturers."

This resolution was accepted by the Conference, with the addition of the following definition :—

> " This resolution relates only to articles connected with munitions of war, and orders by or on behalf of one of the Allied Governments in the country of another."[1]

In practice, however, these resolutions produced but little result, although at the preliminary discussions at the Ministry of Munitions before the conference, the need for such an organisation as the Central Munitions Office had been recognised. Great Britain had embarked on a very large munitions programme, showing a considerable margin over the requirements of the British Headquarters Staff, and it became a matter for discussion whether this programme had been formulated as the best policy for Great Britain only, without considering the more pressing need of her Allies. The Ministry was not of one mind on this point, but finally it was decided to keep to the British programme and make certain definite offers to Russia. A scheme for pooling the whole resources of the Allies, put forward by Mr. Booth, was not adopted, as it was recognised that it was useless to attempt to equip the Russian armies with artillery on the same scale as was necessary for the French and British armies. This was not because the Western Allies were taking an unfair share of the resources at their disposal, but because the open warfare on the Russian front did not demand so large a number of heavy guns, while the Russian ports, roads and means of transport were utterly inadequate.[2] This discussion showed how necessary a central information office was, and at the conference Mr. Lloyd George strongly supported M. Thomas' proposal :—

> " I think it is essential before we come to a consideration of a general plan of campaign for next year, which I hope we shall do, instead of each acting separately on his own, that we should know what the resources of each country are in the matter of war equipment. That is exactly where the campaign of 1915, in my judgment, has broken down ; we did not know how much we could expect from each other . . . I think it is essential that we should show complete confidence in each other in the matter of our resources and what we are capable of doing. It is almost impossible, I think, for there to be any concerted plan of campaign until we know what the equipment of each army is and what it is likely to be."[3]

---

[1] HIST. REC./R/1010/8. [2] HIST. REC./R/1010/10. [3] HIST. REC./R/1010/8.

Mr. Lloyd George hoped that the adoption of M. Thomas' resolutions by the Allied Governments would lead the way to unity of command on the military side, but it was owing to the opposition of the military authorities that the Central Munitions Office was never established. The complete confidence in each other of which he spoke was never attained by the General Staffs until the last months of the war, when Russia had left the Allied Powers and the United States had joined them.

During 1916, although their immediate hopes for co-ordination of all munitions supplies were temporarily abandoned, the Munitions Ministers of the different Allied Powers continually met in conference, to discuss immediate problems of supply.

The negotiations preceding the entry of Roumania into the war, which were carried on throughout the early part of the year, again emphasised the need for co-operation in the supply of munitions.[1] The help of Russia was vital, as all war material for Roumania had to be transported through Russia, and a regular supply of munitions was one of the conditions on which Roumania joined the Allied cause. The undesirability of independent action in buying supplies had to be taught to the Roumanian delegates from the beginning. Besides attempting to appoint an American firm, with German connections, as their buying agents in America,[2] the Roumanian delegate in London acted independently of the chief delegation in Paris. Their methods certainly justified the suspicions, entertained at a conference in London between Mr. Montagu and M. Thomas, to consider the Roumanian munitions requirements, that the Roumanians hoped to get some of these supplied in duplicate by both France and Great Britain.[3]

In January, 1916, a conference, on the lines of the Boulogne Conference, was held at Paris between representatives of the French Ministry of Munitions and General Headquarters Staff on the one side and representatives of the British Ministry of Munitions and General Headquarters Staff on the other, not to discuss matters relating to munitions materials and manufacture, but to consider the quantities of munitions which the French General Staff considered necessary to carry an attack to a successful conclusion.[4]

At the end of March, following a conference at Chantilly, attended by representatives of the Headquarters Staffs of the Allies, an extremely important conference was held at Paris, representatives being sent by Great Britain, France, Italy, Belgium, Japan, Portugal, Russia and Serbia. This conference met to consider the general conditions of the war at the time and the more advantageous use of the Allied forces in the campaign that was about to open ; to examine the resources which each Allied country had at its disposal, and see if in any particular country there was a shortage of men, of material, or of

---

[1] D.D.G.(B). 77.
[2] *Ibid.*
[3] HIST. REC./R/1015/1.
[4] HIST. REC./R/1000/106.

munitions, which it might be possible to meet from any surplus in the possession of other countries; and, lastly, to examine the conditions of a common offensive. These points were discussed at length, the question of the supply of munitions being committed to a sub-committee, the points of reference being :—

(1) Whether by exchange or giving up of material already manufactured, the immediate strength of certain armies could be increased.

(2) Whether the production of munitions in each country could be hastened by the exchange of raw materials or labour.

The conference accepted the action recommended by the sub-committee, and at the end of the meetings passed a resolution affirming the complete community of view and solidarity of the Allies. It confirmed all measures taken to attain unity of action on the unity of front, by which expression was meant the unity of military action secured by the agreement made between the Headquarters Staffs; the unity of economic action; and the unity of diplomatic action, which was guaranteed by the determination to continue the war until the victory of the common cause had been attained.[1] This conference, covering a much wider range than the previous munitions conferences, undoubtedly strengthened the hands of the French and British Ministers of Munition in their struggle to attain co-ordination and common action in the supply of munitions. From the further conferences held in 1916, although the delegates were mainly occupied in questions of supply, the Inter-Allied Munitions Bureau, a new co-ordinating organisation, emerged for centralising the Allied purchases in America.

In the summer of 1916 financial conferences were held in London between Mr. McKenna, then Chancellor of the Exchequer, and the French, Italian and Russian Finance Ministers, who agreed that it would be greatly to the interest of the Allies to centralise the purchases of war materials, munitions, raw materials and machinery, which they had to make in neutral countries. They undertook to lay before their respective Governments before 1 August a scheme for the institution of an International Bureau of Munitions to attain this purpose. The French Ministry of Munitions took immediate action, and approached Mr. Montagu, with the result that an Anglo-French conference was held on 30 August to discuss the proposals of the Finance Ministers. The two Governments had already accepted the proposals in principle, and the conference worked out the conditions for the establishment of an Inter-Allied Munitions Bureau in London and for the co-ordination of the work of the two purchasing missions already acting in New York. The work of the Bureau was in the first place to be limited to the United States, but the French representatives wished the question of the inclusion of Canadian purchases to be brought up later. An agreement was signed on 6 September, 1916,

[1] Hist. Rec./R/1010/39.

by the British and French Ministers of Munitions, defining the functions of the Bureau. Its activities were limited to certain munitions—arms and ammunition, their component parts and the metals of which they were composed, with nitro-cellulose powder and high explosives, and certain raw materials for explosives, such as benzol. Later the inclusion of transport and aeronautical supplies was to be considered. The action of the Bureau was to be restricted to articles over which there was a risk of injurious competition between the two Powers. The Bureau was to endeavour to obtain programmes of the munitions requirements of both Powers for a considerable time in advance, and was to be furnished with full information as to the orders already placed. The Bureau was not to act as a purchasing agent, as co-ordination in the United States had already been obtained by the employment of Messrs. J. P. Morgan & Company as agents by both Powers. It was arranged, however, that the two national missions in New York were to meet in frequent consultation with each other and with Messrs. Morgan.

The scheme as it emerged from the conference was far from fulfilling the objects of the Finance Ministers. In the first place, the participation of Russia and Italy was deferred, and in the second the representatives of both Ministries of Munitions seem to have been over-anxious to avoid giving full powers of control to another organisation, which might hinder rather than aid the quick fulfilment of demands for munitions. On the other hand, owing to the independent action and doubtful policy still pursued by Russia and Italy, it was perhaps felt that the time was not yet come for full confidence and co-ordination.[1]

At the Anglo-French Munitions Conference, held at Paris on 24–27 September, 1916, a scheme for the organisation of the new Bureau was brought forward by the French delegates appointed to the Bureau, and was further considered by the British representatives at the conference. It was announced that the British members of the Bureau had already been chosen.[2] At a further conference in October it was decided that Russia and Italy should be invited to send one representative each to the Bureau, and that the smaller Allies should be represented by one delegate.[3] The Russian and Italian delegates, however, were not appointed until the spring of 1917, and the action taken by the Bureau belongs to the latter part of the war.[4]

VII. Special Missions and Organisations.

Besides permanent delegations, committees and conferences, special missions from one Allied Government or another frequently visited each other's country, with a view generally to obtaining technical knowledge. This was particularly the case between Great

[1] 94/Gen. No./540.
[2] HIST. REC./R/1011/4.
[3] HIST. REC./R/1011/7.
[4] C.R. 4633; see below, p. 32.

Britain and France. In April, 1915, before the formation of the Ministry of Munitions, the Munitions of War Committee sent a mission to enquire into the production of munitions of war in France. Its members Mr. (later Sir Ernest) Moir and Mr. (later Sir Fred) Lobnitz, visited a number of munition factories, and reported that they had been freely shown everything and had been able to judge as to the actual facts by paying visits to workshops, chosen by themselves out of a list of over 150 firms in the Paris munitions district.[1] Lord Chetwynd's mission in October, 1915, to investigate French methods of shell-filling and the explosives used, was welcomed by M. Thomas, who hoped that collaboration between the British and French technical experts would result in increase of output and economy in the use of materials; and the mission was given every opportunity of obtaining all the information required at the factories. Another mission, appointed to study the output of munitions in France, visited 23 factories during December, 1915. In the following May, Sir G. Croyden Marks went to France to report on the use of labour-saving devices in French munition factories. In the autumn of 1916, Major-Gen. Headlam went to Italy to study the supply of munitions in that country, and visited factories and experimental schools, besides seeing Italian artillery in action at the front.[2]

Reciprocal visits were paid to Great Britain. A French chemical expert visited British works to study the production of benzol and phenol in July, 1915,[3] and in the following November a technical mission arrived for a further investigation of the same subject.[4] In October, 1915, when France was anxious to obtain shell steel from Great Britain and British steel manufacturers found great difficulty in manufacturing to the French War Office specifications, a commission of French steel manufacturers came to Great Britain. They had various conferences at the Ministry of Munitions with the British officials and the Steel Makers' Committee, to consider the possibility of altering the specifications, and afterwards went for a week's tour of the British steel works in Middlesbrough, Glasgow and South Wales.[5] As, however, permanent technical representatives of the French Ministry of Munitions were attached to the French Commission in London there were fewer special technical missions from France to Great Britain.

Special reports on munitions work in France were sent by M. Thomas to the Ministry of Munitions during 1916. In December, for instance, a memorandum was drawn up on the manufacture of 155 mm. steel shells, and Major-General Headlam recommended that it should be translated and circulated amongst the British firms who were making these shells for France.[6]

---

[1] Hist. Rec./R/172/5.
[2] Hist. Rec./R/1000/109.
[3] Hist. Rec./R/1011/2; D.D.G.(C.)/C.M.G./068.
[4] Hist. Rec./R/1011/41.
[5] Hist. Rec./R/1810/4.
[6] Hist. Rec./R/1011/35. See also Hist. Rec./R/200/34, 1011/34.

At the close of 1915, proposals were put forward by the French Government for closer co-ordination between the different Inventions Departments in the Allied countries. On 13 November a Decree was issued establishing a French Inventions Department under the Minister of Education and Art, and in the following month a Bill passed the Senate establishing an obligatory right in favour of the State over patented inventions relating to national defence. The Minister of Education then approached the British representatives in Paris, suggesting a plan of collaboration between the Allied countries in order to stimulate research and facilitate the use of different inventions. After consideration it was found that the proposals could not be accepted, chiefly on legal grounds, but the British Government assented to the establishment in Paris of an International Committee, on which all the Allied powers were to be represented. One representative of each Allied Power was to be appointed to serve in London to be accredited to the Munitions Inventions Department. The Admiralty refused to co-operate, but shortly after the appointment of the British and French representatives on the International Committee, a special French representative was sent temporarily to co-operate with the Admiralty.[1]

In March, 1916, Mr. J. W. H. Bleck, the President of the British Chamber of Commerce in Portugal, was sent by that country to obtain assistance in munitions and other material to enable Portugal to re-equip her Army. An effort was made so far as possible to meet the list of requirements put forward and an arrangement was made to finance Portuguese purchases up to £2,000,000. A memorandum drawn up by the Portuguese Prime Minister proposed to adopt the same type of war material as was used by the British Army, while all purchases were to be effected in Great Britain through the British Government. In April, a military delegation also arrived from Portugal with a further list of the requirements of the Portuguese Army. In pressing their claims they pointed out the assistance which Portugal had already given to the Allied powers. Fifty field guns had been supplied to Belgium and 20,000 rifles to South Africa, a factory had been allocated for the manufacture of shells for Belgium and it was not proposed to divert it for Portuguese requirements, while the Portuguese Government had arranged for an extensive supply of wolfram to the Allies.[2]

---

[1] HIST. REC./R/263.8/14.
[2] D.D.G.(B). 78.

CHAPTER II.

DEVELOPMENT OF THE PRINCIPLE OF CO-OPERATION, 1917–1918.

I. Introduction.

The events of 1917 forced the Allies, almost against their will, to take measures to secure real co-operation in the supply of munitions. In the first place, the unrestricted submarine campaign and the resulting shortage of shipping and materials made the three chief Powers realise their inter-dependence to a far greater degree than before, and resulted in schemes for economising tonnage and materials by common action. The importance of such steps was emphasised by the policy pursued by the United States of America on entering the war. Since the European Allies all looked to the new combatant to make good their shortage and aid them financially in the American markets, the United States insisted on some guarantee that all such demands were really for war purposes and called on the Allies to put forward only considered requirements which had previously been scrutinised by an inter-Allied organisation in Europe.[1] At the same time the fact that Great Britain and France had to meet large demands from the American Army also necessitated joint action. The attainment of co-operation was further assisted by the third great event of 1917. The course taken by the Revolution in Russia, which finally culminated in her withdrawal from the Alliance and the peace of Brest-Litovsk, undoubtedly removed one of the chief obstacles to Allied co-operation. The geographical isolation of Russia, her administrative methods and even the racial characteristics of her representatives, had from the first prevented that complete confidence amongst the four chief Powers, which was a necessity for combined action in the provision of munitions.

The effects of these events on the munitions problem appeared only to a limited extent during 1917, and the previous policy of inter-Allied conferences and the establishment of small committees to deal with particular questions was for the most part pursued. The absolute necessity, however, of much stronger permanent inter-Allied munitions organisations, endowed with the necessary political influence, which had been hitherto absent from the committees, was recognised, and their formation was the chief feature of inter-Allied munitions history in 1918.

II. Conferences and Missions.

In 1917 inter-Allied conferences were held in London, Paris, Rome, Petrograd, St. Jean de Maurienne, Calais, Folkestone and Rapallo, from which further inter-Allied action resulted.[2] With regard to the

[1] See Vol. II, Part III.

[2] *War Cabinet Report*, 1917, pp. 15-16. For a list of Inter-Allied Conferences see Appendix IV.

supply of munitions, the most important were the conferences in Rome and Petrograd early in 1917, at which the equipment of the Russian Armies for the coming spring campaign was discussed ;[1] the French and British conferences on non-ferrous metals in Paris in January and March, 1917, at which joint copper purchases were agreed upon ;[2] and finally the inter-Allied conference at Paris in November and December, 1917, which resulted in the formation of both the Allied Maritime Transport Council and the Inter-Allied Munitions Council.[3]

It was decided at the Rome conference, January, 1917, to send special missions from Great Britain, France and Italy to Petrograd, where, at a joint conference, a new Russian munitions programme was drawn up. The principal members of the British Mission, Lord Milner, General Wilson and Lord Revelstoke,[4] were accompanied by artillery and munitions experts, who were enabled to realise the complete chaos that existed in Russian Government Departments and the uselessness of sending valuable war material to Russia, unless some efficient supervision was organised. The munitions requirements were considered by a sub-committee on munitions, who examined the demand put forward by the Russians for 13,000,000 tons of munitions of all kinds. After scrutinising the capacity of Russian ports and railways, the sub-committee decided that 4,500,000 tons was an optimistic estimate of the amount of material that could be handled during 1917. Of this 1,200,000 tons was allotted for artillery, ammunition and aeroplanes.[5]

On the report of the Mission as to the state of affairs in Russia, it was realised that the methods of dealing with Russian requirements would have to be altered. In Petrograd a British Military Equipment Section, under Brigadier-General Poole, was established, its duties being :—(1) to advise generally on the necessity or otherwise of the demands made by Russia for British artillery material and military stores ; (2) to supervise the mobilisation and equipment of the batteries supplied and to start schools of instruction ; (3) to supervise the equipping of the aviation material and to instruct the Russian officers in the latest methods ; (4) to advise as to the necessity for supplying the materials, machinery, metals, etc., for which Russia asked.

The staff of the section arrived in March, 1917, and in the months that followed, working in close conjunction with the French Military Equipment Organisation, it obtained a large amount of necessary information on Russian conditions and started artillery and aviation depôts, but its work was largely neutralised by internal disorder in Russia.[6] In England the supervision of Russian supplies was entrusted to the Cabinet Committee, under Lord Milner,[7] which dealt with

[1] *War Cabinet Report*, 1918, p. 16.
[2] C.R.V./Gen./0256.
[3] C.R.V./F/033 ; HIST. REC./R/2060/14 ; See below, pp. 35, 38.
[4] *War Cabinet Report*, 1918, p. 16.
[5] C.R. 4325.
[6] C.R. 4357.
[7] See above p. 16.

finance, allocation of supplies, shipping tonnage and priority.[1] In February, 1918, when the Committee was dissolved, its functions with regard to Roumanian supplies, which had been included in the Russian tonnage estimates, were transferred to the Foreign Office.[2]

The entry of the United States of America into the war necessitated a complete reorganisation of the various British organisations representing Government Departments already established in the States. Following Mr. Balfour's special Mission, a permanent British War Mission, under Lord Northcliffe, was appointed in April, 1917. This organisation, which rapidly increased in numbers and importance, controlled the departmental missions already established in the United States for the production and inspection of munitions, as well as the shipping and financial organisations.[3]

In November, 1917, an American mission under Colonel House came to Great Britain in order to arrange with the British Government practical methods of co-operation between the two countries.[4] This mission was represented at an inter-Allied conference at Paris in December, as a result of which it strongly urged the American Government to accept the offer of the French and British Governments to equip all the American divisions up to June, 1918, with the best marks of French and British guns and howitzers, while American effort was directed to the production of propellant and high explosive on the largest possible scale. All plans for the development of an independent programme by the United States should be subordinated to the idea of the strongest possible joint effort, and where capacity and ability to manufacture was established no experiments should be tried. The later efforts at Anglo-American co-operation are dealt with below.[5]

III. Organisation within the Ministry of Munitions.

At the close of the year 1917 it was found necessary to institute some general control of the branches of the Ministry of Munitions established in Paris, consisting of an organisation under Mr. Sawyer for securing general supplies, an Optical Munitions Branch, an Inventions Branch, a Chemical Warfare Research Branch, and an Aircraft Production Branch, each of which was in touch with the corresponding branch in the French Ministry of Munitions, with no connecting link between them except in Great Britain. This weakened their position in dealing with the French Government, and early in the following year the Mission Anglaise de l'Armament was established, under Sir Charles Ellis, who represented the Minister of Munitions. The Paris branches of the Ministry were placed under his control with regard to all questions of general policy, but on technical matters

[1] C.R. 4322.
[2] C.R.4357.
[3] For details of this reorganisation see Vol. II, Part III.
[4] *War Cabinet Report* 1917, p. 17.
[5] See below p. 37.

still dealt directly with the sections of the British Ministry to which they were attached.

A similar organisation was established in Rome, upon the advice of General Savile, who went in February, 1918, to Italy on a special mission to enquire into Italian explosives manufacture. At the beginning of June the Italian branch of the Ministry of Munitions was established, under Mr. Sawyer, as part of the Mission Anglaise de l'Armement at Paris. Its chief work was to obtain information as to the urgency of the requirements of the Italian Government in connection with the supplies sent from Great Britain to Italy, but it had practically no work in connection with British contracts in Italy.[1]

To meet the growing importance of the inter-Allied work in connection with munitions, it was found necessary at this time to strengthen the sections at the Ministry of Munitions which dealt with Allied requirements. On 1 April, 1917, the Allies Section of the Ministry was established as part of the Department of Munitions Requirements and Statistics, absorbing the work hitherto done by Deputy Director-General (B) and the section of the Commission Internationale de Ravitaillement housed within the Ministry. This organisation was further developed by the establishment of the United States of America Section, under Mr. Teesdale, since the Americans decided to deal direct with the Ministry and not through the Commission Internationale de Ravitaillement, and by the appointment of Sir Charles Ellis as an additional member of the Munitions Council with special responsibility for questions relating to the Allies.

On the withdrawal of Russia from the Allied powers, the Inter-Ally Council on War Purchases and Finance decided that the liquidation of Russian supplies should take place separately in each country which had granted credits to Russia, and that the proceeds in each case should be handed over to the national Treasury. The final result was, however, to be presented to all the Governments concerned, the Secretariat of the Inter-Ally Council acting as a liaison in the matter between the several national liquidation committees.[2]

In Great Britain the War Cabinet decided, on 30 November, 1917, that the manufacture of warlike stores for Russia should be suspended and that such as were already manufactured should be diverted, or converted to British or Allied use. Shipment of non-warlike stores was not forbidden, but with the rapid increase of disorganisation in Russia, and the increasing shortage of Allied tonnage, the distinction between warlike and non-warlike was early lost sight of, and shipments from Great Britain to Russia ceased altogether. The principles governing the liquidation of Russian contracts were settled by the Treasury Committee for Liquidating Russian Contracts appointed in December, 1917, which represented the Treasury, the Ministry of Munitions

[1] Vol. II, Part VII, pp. 12-14.
[2] HIST. REC./R/1010/23.

and the Commission Internationale de Ravitaillement. Negotiations with the Russian Government Commission in London, which was not taken over by the Bolshevik Government resulted in its dissolution on 31 May, 1918, and the appointment of the Russian Liquidation Committee, an inter-departmental committee working through the staff of the Commission Internationale de Ravitaillement, to which various members of the Russian Government Commission were attached. After the Armistice the demand for Russian war supplies ceased and the supervision of the actual remaining stock was transferred in January, 1919, to the Allies Section of the Ministry of Munitions. The Committee was dissolved on 31 December, 1919,[1] and the outstanding Russian business, which was mainly a matter of accountancy, was taken over in January, 1920, by the Ministry of Munitions and carried out by the Russian Accounts Committee.

IV. Inter-Allied Munitions Bureau.

The work of the Inter-Allied Munitions Bureau[2] was hampered from the outset by the fact that neither Russia not Italy were prepared for effective joint action in purchasing supplies in the United States. In spite of repeated negotiations an Italian representative was not appointed till the middle of March, 1917, and though a temporary representative of the Russian Government was appointed by the Russian Mission in London, the convention was apparently never signed on behalf of the Russian Government,[3] Further, although established by the French and British Ministers of Munitions, the members of the Bureau, in spite of their undoubted ability, were not of sufficient weight in the official hierarchy to insist on the Bureau discharging the functions originally laid down. Moreover, the New York Conference,[4] which was largely dominated by Mr. Stettinius, of Messrs. J. P. Morgan & Company, was not prepared to give the full information needed by the Bureau, and the policy pursued by both French and British Ministries of Munitions resulted in arrangements being made by the Allies for joint action outside the Bureau.[5] It should also be noted that the dominating factor early in 1917, with regard to Allied purchases in America, was not so much the question of supplies and prices, but the provision of the necessary transport facilities, so that the functions of the Bureau were necessarily somewhat curtailed. In regard to shell steel and nitrocellulose, the Bureau was, however, able to obtain information as to the supplies that would be available for 1917, which enabled it to give agreed advice as to how far the Allied Governments could carry out their programme. In other instances it was able to bring about, more or less rapidly, an understanding between the Allied Governments as to the degree of liberty with which each of them might act. With the entry of America into the war it was obvious that a

---

[1] Sec./Gen./2630 ; Hist./Rec./H/1010/1.
[2] See above p. 24.
[3] Hist. Rec./R/1010/35.
[4] See above, p. 10.
[5] Hist. Rec./R/1010/28 ; C.R.V./U/133.

reorganisation of the Bureau was necessary, and though its members offered their services to the four Governments, when the new purchasing arrangements had been decided on, the Bureau was practically ignored. Finally, by the consent of the four Governments concerned, it was dissolved in January, 1918, on the formation of the Inter-Allied Munitions Council.[1]

V. Inter-Allied Bureau of Statistics.

To enable the Inter-Allied Munitions Bureau to carry on its work of co-ordinating the Allied munitions purchases in America, it was decided at a conference held in Paris in November, 1916, to set up the Inter-Allied Bureau of Statistics. In January, 1917, this Bureau was established as a permanent organisation, with an officer appointed to it by each of the four Allies, France, Great Britain, Italy and Russia. Each of these officers nominated an agent in his own country, who furnished the necessary particulars concerning the production of materials of war and munitions, the stocks in each country, programmes of production and the assistance given by each country to its Allies. The work of the Bureau in Paris consisted of preparing statements, co-ordinated from the reports forwarded by the agents, and communicating the results to the Allies.[2] The Bureau found some difficulty in obtaining these statistics, especially those relating to programmes, in sufficient time to be of real assistance in co-ordinating purchases of materials and munitions abroad,[3] but their statistics formed the basis on which the Inter-Allied Munitions Council started work. On the formation of this body in 1918, the Bureau of Statistics continued its existence, acting as the Secretariat of the Council.[4]

VI. Inter-Allied Munitions Committees.

(*a*) INTER-ALLIED TRANSPORT COMMITTEE.

In June, 1917, it was agreed, on a proposal received through M. Cambon, the French Ambassador, that a permanent organisation should be established at Paris to examine all questions of continental transport, the management of ports, and the pooling of Allied resources.[5] This resulted in the institution of the Inter-Allied Transport Committee composed of one representative from Great Britain, France, the United States of America and Italy. It met in Paris under the presidency of the French representative, M. Claveille, Under-Secretary of State for Transport. The Ministry of Munitions considered, however, that the War Office was most concerned in continental transport,

[1] HIST. REC./R/1010/35.
[2] HIST. REC./R/1010/11.
[3] HIST. REC. /R/1010/28.
[4] Memorandum on Organisation of Inter-Allied Munitions Council. (HIST. REC./R/1010/13.)
[5] Letter from M. Cambon, 25 June, 1917. (C.R.V./F/021.)

so that Brigadier-General Mance was appointed British representative,[1] the permanent representative in Paris being Colonel Thornton. The Ministry, however, had made various very satisfactory arrangements with the French Government with regard to the transport of material from England to France and Switzerland and *vice versâ*, and the War Office agreed that the question of the Ministry transport arrangements would not be raised from the British side, and that if it was brought before the Committee by the French, no action would be taken without consulting the Ministry representative in Paris.[2]

(*b*) Inter-Allied Gas Committee.

Very close relations were established between the British and French gas services, regular conferences being held between the Chemical Advisory Committee, the Anti-Gas Committee and the Inspection des Etudes et Expériences Chimiques. The other Allies were not consulted until September, 1917, when a conference, held in Paris (17 to 19 September) was attended by representatives of France, America, Great Britain, Belgium, Italy and Russia. It was then agreed that, besides periodical conferences, it would be advisable to establish a more permanent liaison between the different chemical services. In consequence the Inter-Allied Gas Committee was established at Paris at the Inspection des Etudes et Expériences Chimiques, under M. Terroine, Secretary-General of the Inspection, with an officer from each Allied nation to represent the national organisations on the Committee. The object of the Committee was to collect and transmit information obtained from the national chemical services.[3] This Committee was later known as the Inter-Allied Committee on Chemical Warfare.[4]

(*c*) Inter-Allied Committee on Tanks.

At a meeting on 9 January, 1918, the military representatives of the Supreme War Council recommended the formation of an Inter-Allied Committee on Tanks at Versailles, as the supply of inter-Allied tanks on a definite co-ordinated basis was a matter of great urgency. The formation of the Committee was approved by the War Cabinet, each Ally being represented by not more than five representatives. The Ministry of Munitions and the War Office were represented jointly on the Committee, which was to advise on the best methods of carrying out the tank policy and strategy initiated by the Supreme War Council. In May, 1918, it was decided that questions as to the allocation of tanks amongst the Allies should be referred in future to the Inter-Allied Tank Committee, but in August the Committee was adjourned *sine die* and the question of the allocation of British tanks to the Allies was undertaken by the War Office.[5]

---

[1] C.R.V./F/021.
[2] *Ibid.*
[3] D.G.M.D./Gen./0113.
[4] See Appendix II and Vol. XI, Part II, Chap. II.
[5] M.C. 636.

(*d*) Other Inter-Allied Committees.

An inter-Allied committee, which worked through the Commission Internationale de Ravitaillement, was established at Jassy to co-ordinate the requirements put forward by Roumania and control the materials supplied.[1] In Greece, as a result of the policy decided on at an inter-Ally conference in Paris in September, 1917, an inter-Allied commission was established at Athens to report on the progress of the mobilisation of the Greek Army. At Salonica a similar organisation secured co-operation between the British and French authorities in the supply of military requirements for the Serbian Army.[2]

VII. Allied Maritime Transport Council.

Throughout 1917 the shipping problem became, even more than shortage of labour or raw materials, the controlling factor in the supply of munitions.[3] The European Allies were all anxious to obtain financial aid for their purchases in the United States, as soon as that country entered the war, but they had also large stocks of materials lying in the American ports for which European credits had sufficed, but for which no tonnage was available. At the end of the year the French alone had over a million tons of material awaiting shipment from the United States.[4] The problem had been considered between the European Allies in the earlier years of the war and inter-Allied co-operation in shipping had been advanced by various steps. An Inter-Allied Committee on Shipping had been established by the Commission Internationale de Ravitaillement as early as April, 1916, but in the following December the French and British Governments agreed to set up an Inter-Allied Executive in London, which was later joined by Italian representatives, in order to control the chartering of neutral tonnage and to allocate neutral shipping amongst the three Allies.[5]

Owing to the very serious shortage of shipping it was decided at the munitions conference held in Paris in November and December, 1917, to set up a new inter-Allied organisation to control tonnage,[6] and as a result of a further conference in February, 1918, between representatives of France, Italy, the United States and Great Britain, an Allied Maritime Transport Council in London was organised to deal with the general problem of Allied transport. Each nation was responsible for the management and supervision of the tonnage under its own control, but the Council secured the necessary exchange of information and co-ordination of effort between the four Governments. To this end, the Council had the power to adjust programmes of imports with regard to the carrying capacity of the available tonnage

[1] *War Cabinet Report*, 1917, p. 19.
[2] *Ibid*, 1918, p. 26.
[3] See also Vol. VII, Part V.
[4] M.C. 827.
[5] *War Cabinet Report*, 1918, p. 22.
[6] Hist. Rec./R/2060/14. The final sitting of the conference was on 3 December, 1917.

and to allocate the tonnage under their control for the transport of the most urgently needed commodities.[1]

The Council did not actually meet till March, 1918, when it was faced by a critical shipping position, the tonnage in Allied control (excluding American tonnage and any additional neutral tonnage that might be obtained) leaving a deficit of some 10,000,000 tons in the import programmes of the three European Allies. The Council strongly urged that American tonnage should be allocated for the use of the Allied services and that Dutch tonnage in American ports should be acquired. The American military programme seemed likely to absorb both these sources of additional tonnage. To enable the Transport Council to carry out its difficult duties, it called upon the different inter-Allied organisations to furnish it with programmes of the estimated amount of tonnage which they would require for imports, but it found itself hampered by the complete lack of an effective inter-Allied munitions organisation. It therefore brought considerable pressure to bear on the Allies to hasten the formation of the Inter-Allied Munitions Council.[2]

The satisfactory preparation of an inter-Allied munitions programme was essential from every point of view, since munitions constituted a very high proportion of the imports for which shipping had to be provided. In the case of Great Britain, the amount of munitions and munitions material imported in 1918 exceeded the import of foodstuffs. Excluding oil for the Navy, the total imports into Great Britain were 31,000,000 tons, of which 13,000,000 tons were foodstuffs and 15,000,000 tons munitions.[3] In 1917 the total import of munitions into Great Britain had been 12,456,000 tons,[4] and the amount actually received in 1918 equalled the total figure required to carry out the original munitions programme for 1918, which had been, however, drastically cut down early in the year in view of the expected shortage of shipping.[5] The following figures show some of the chief imports during the year :—

	Tons.
Grain and flour	6,850,000
Meat	1,250,000
Sugar	1,300,000
Oils, fats and oilseeds (excluding oil for Navy)	1,750,000
Iron ore	6,550,000
Other metallic ores	1,600,000
Timber	2,500,000
Cotton	650,000
Paper and paper making materials	550,000
Iron and steel and other metals ..	900,000
Chemicals, including nitrates ..	1,000,000[6]

[1] Hist. Rec./R/2060/14.
[2] M.C.827.
[3] *War Cabinet Report*, 1918, pp. 172, 174.
[4] The amounts for November and December in this figure were estimates only.
[5] D.M.R.S. 595.
[6] *War Cabinet Report*, 1918, p. 174.

The Allied import programmes were drawn up by the Maritime Transport Council for the cereal year, and from 1 December to 31 August, 1919, it was estimated that shipping tonnage was available for the import by the three European Allies of 40,000,000 tons of foodstuffs and munitions, of which not less than 22,000,000 tons would be required for foodstuffs and military oats. In the preceding cereal year, Allied munitions imports had reached the figure of 18,400,000 tons, Great Britain having received 11,900,000 tons, France 5,200,000 tons and Italy 1,400,000 tons. The Inter-Allied Munitions Council had therefore to reduce its first programme of 22,600,000 tons, which allowed for increased supplies to France and Italy, to 18,000,000 tons, in view of the shipping allocation made by the Maritime Transport Council.[1]

VIII. Inter-Allied Council on War Purchases and Finance.

On the return of the Balfour Mission from America, negotiations were opened for the formation of an inter-Allied munitions organisation, but this was delayed by the urgent need of establishing a purchasing commission for Great Britain in the United States, and organising a council, which would control all the purchases of the Allies in the United States, without limiting its activities to munitions. The agreement with regard to the Purchasing Commission (25 August, 1917) contained the following clause :—

> "Since other foreign Governments engaged in the war with the enemies of the United States of America may have entered or may enter into similar arrangements with the Secretary of the Treasury with the approval of the President of the United States of America it is understood that all such foreign Governments shall agree among themselves as to their several requirements and as to the priorities of delivery desired to be observed as between them in respect to matters of major importance. Such agreement may be arrived at by the Inter-Allied Council sitting in Europe or pending the establishment of such Council by representatives of the Allied Governments acting in the United States of America. The Commission in making negotiations and arrangements for deliveries shall take into consideration the recommendations of such foreign Governments so arrived at and it shall be guided so far as practicable by such recommendations as well as by the conditions existing in the United States of America with reference to the possibilities of production and manufacture and the requirements of the United States of America."[2]

The Council, which was formed under the title of the Inter-Allied Council on War Purchases and Finance, was practically imposed on the European Allies by the American Government, in order to convince the American public that the Allies' requirements, both as to finance and actual materials, were really for military purposes alone. For this purpose, its members were required to be men well known to

---

[1] D.M.R.S. 595.

[2] HIST. REC./R/1010/17 ; See also Vol. II, Part III, Chap. IV.

the American public, while the American Government desired it to carry enough weight to ensure that all the Allies would bring their requirements before the Council for co-ordination, before presenting them to the American Purchasing Commission.[1] The Council was formed under the Presidency of Mr. Oscar T. Crosby, representing the American Government. The representatives of Great Britain were Mr. Austen Chamberlain and Lord Buckmaster; of France, M. Clementel, M. Bignon and M. Loucheur; of Italy, Baron Meyer des Planches, Signor Attolico and General Mola. Its permanent organisation was not adopted till the fourth meeting, which took place in Paris in March.[2]

The original purpose of the Council was to co-ordinate the purchases of the Allies in America and also to advise the American Government as to the most effective use, which could be made of the supplies available in that country for the use of the Allies. It was afterwards necessary, on financial grounds, to extend the work of the Council to Allied purchases in neutral countries.[3] In January, 1918, the Council found that it had not sufficient information to enable it to carry out its work of co-ordinating the purchase of munitions, although with regard to other materials the necessary information was furnished by the inter-Allied organisations, such as the Wheat Executive, Sugar Commission, Meats and Fats Executive and the Nitrate of Soda Executive, which were already in existence. As a result of the meetings of the Council, held from 9 to 14 February, 1918, the need for a much closer co-ordination in the formulation of programmes for munitions and other direct war supplies was recognised, and a resolution was adopted urging that measures should be taken to establish some form of inter-Allied munitions organisation, to study the statements which had already been asked for from the Allies.[4]

The same need was felt by the Allied Maritime Transport Council, which urged the establishment of some authority to which it could refer for the necessary assurance that the Allied requirements put forward were in accordance with military needs, and for advice if revision of tonnage allocations became necessary.[5] The existing inter-Allied munitions committees dealing with special munitions materials could not supply this information, as no connecting link existed between them, nor did they cover all the forms of munitions and materials which were included in a munitions programme.

IX. Inter-Allied Munitions Council.

Thus, pressure was being exerted in several directions with a view to the establishment of a really effective inter-Allied munitions organisation, and in June, 1917, suggestions emanating from the

[1] Cable N.Y. 49432. 9 August, 1917. (Sec./Gen./2548.)
[2] HIST. REC./R/1010/23.
[3] *Ibid.*
[4] M.C. 827.
[5] Letter from Mr. Churchill to M. Loucheur, 13 April, 1918. M.C. 827.

Ministry of Munitions were referred by the War Cabinet to a Committee under the chairmanship of Lord Curzon. A draft constitution was drawn up, with the following provisions :—

(1) An Inter-Allied Munitions Council of five members or ten, representing the Governments of France, Great Britain, Italy, Russia and the United States respectively, shall be established in London to examine and co-ordinate the demands for munitions of war and the raw materials thereof required by the Allied Governments or their Nationals from the United States of America, and to submit a programme of such requirements to the United States Government. In the case of U.S. supplies being insufficient to meet requirements of any of the Allies in any particular, the representative of such Government will present to the Council such information as he may think necessary in support of his application.

The Allied Governments will not place orders or attempt to obtain offers, or make enquiries in the United States of America for any of the materials specified below, except in accordance with the programme submitted to and reported on by the Inter-Allied Council.

The Allied Governments shall further exercise such supervision over their respective nationals as shall secure that no private orders are placed in the United States except in accordance with the programmes approved by the Council, which will make provision for essential civilian requirements.

(2) The requirements to be submitted to the United States Government by the Inter-Allied Council shall include munitions of war and raw material and machinery required for their manufacture as specified in the attached schedule.

(3) The Inter-Allied Council shall consider these requirements in the light of the tonnage and finance available for the articles mentioned in the schedule;[1] and no demand shall be put forward which has not been approved by the Finance Department of the Government concerned as being provided for under the financial arrangements between such Government and the United States Government, and also by the Shipping Department of such Government as being consistent with the programme of available tonnage.

(4) Applications put forward by the Allied delegations on the Commission Internationale de Ravitaillement for purchase outside the United States of America out of British credits will

[1] The schedule of materials included "all articles dealt with by the Ministry of Munitions, including aeroplane requirements, railway materials, and motor vehicles of all kinds, also guns, ammunition and materials required by the Admiralty (but not ships or oil fuel)." Cable No. 2531(R). Foreign Office to Sir C. Spring-Rice, 30 June, 1917. (Sec./Gen./2548.)

be dealt with in accordance with the Financial Agreements between the British and other Allied Governments.

The members of the Council will use the delegations of their Governments on the Commission Internationale de Ravitaillement (or in the case of the British member, the Ministry of Munitions) as their staffs.

(5) The Governments of Belgium, Serbia, Roumania, Portugal and Montenegro shall have the right to present their requirements in respect of supplies to be financed by the United States Government and to make representations in connection therewith jointly or severally to the Inter-Allied Council.

(6) The recommendations of the Council and the results of their discussions shall be transmitted to the United States Government by the American representative. In the event of it being found impossible for any reason to meet the whole of the Allied requirements in the United States of America, the Inter-Allied Council will prepare a reduced programme for the approval of the respective Governments and after having obtained agreement will submit it to the United States Government through the American representative, together with a statement as to the relative urgency of the various items contained therein."[1]

This scheme was submitted on 30 June, 1917, but no further steps were taken pending the formation of the Inter-Allied Council on War Purchases and Finance. In October, M. Loucheur, the French Minister of Munitions, and Mr. Churchill met, and agreed that the formation of the inter-Allied organisations should be pressed vigorously, and the Ministry of Munitions urged this view on Lord Curzon since " the Allies' Munitions supplies from America may at any moment become jeopardised as a result of the enormous American programme, which grows from day to day."[2] No further steps, however, were taken to form the Munitions Council until the inter-Allied conference held in Paris in November, 1917, when it was agreed that an Inter-Allied Munitions Council should be set up in Paris. Again the question was shelved until April, 1918, when the need of co-ordinating the American programme for munitions with that of the Allies, together with the continued pressure brought by the Inter-Allied Council on War Purchases and Finance and the Allied Maritime Transport Council led Mr. Churchill to take further action. He wrote to M. Loucheur (13 April, 1918) urging that the French Government should request the Allied Munitions Ministers to nominate representatives. Mr. Churchill proposed that the Council should consist of the Ministers of Munitions and three other representatives of each Ally, one of whom should be a soldier and another a permanent representative at Paris, and suggested

[1] Hist. Rec./R/1010/17.
[2] 12 October, 1917. (M.C. 827).

that the three British representatives should be Sir Charles Ellis, Mr W. T. Layton and General Furze.[1]

While these negotiations were proceeding, General Pershing wrote to M. Clemenceau proposing that all supplies and war materials used in common by the Allied Armies should be pooled, and the power to order the allotment and distribution of supplies to the different Armies should be vested in a military chief, who would occupy with regard to supplies and material a position similar to that occupied by Marshal Foch with regard to military operations.[2] A conference was arranged between M. Loucheur and Colonel Dawes, the Purchasing Agent of the American Expeditionary Force, on 2 May. The following agreement was reached, subject to the approval of M. Clemenceau and General Pershing:—(1) The Americans and French would unite their resources, including warehouse space, materials, etc., and the distribution and transportation of these resources. The French were to write to the British, stating that the Americans and French had discussed a plan of unified control for supply services and to invite British co-operation in the scheme. (2) A Frenchman was to be placed in charge as Commander-in-Chief of Supplies, with a staff of American and French officers representing the different services concerned.[3]

An inter-Allied conference, at which representatives of France, Great Britain, the United States and Italy were present, considered this question on 6 May. Sir John Cowans, representing Great Britain, strongly demurred to the proposals of Colonel Dawes, pointing out that the control of supplies was a far larger question than appeared to have been realised by the Americans. A further conference was held on 16 May, 1918, at which no British representative was present, but a decision was reached between the representatives of France and the United States involving the constitution of a Board, consisting of representatives of each of the Allied Armies, to control Army supplies. This, in principle, amounted to a military dictatorship of the entire Allied service of supply. The British point of view, however, evidently had considerable weight with the different representatives, and the scheme was finally limited to the distribution of supplies of food stuffs and gazoline immediately behind the lines held by the Allied Armies in France, the control of military supplies in general being temporarily put on one side,[4] though the War Office agreed to the creation of such a military Board as was proposed by General Pershing to secure that existing dock, warehouse and railway facilities were not duplicated by the American Army, provided the decision of such a Board was unanimous.

In consequence of this limitation, General Pershing's proposals no longer cut across the British proposals for the establishment of the Inter-Allied Munitions Council, and the representatives appointed to the Council met in conference on 4 June to consider its organisation.

---

[1] M.C. 827.
[2] *Ibid.*
[3] *Ibid.*
[4] *Ibid.*

The following memorandum was accepted :—

(1) *Scope.*—The Inter-Allied Munitions Council is an authoritative body whose personnel and sources of information are such as to enable it to study, criticise and make proposals in connection with Munitions Programmes. Its deliberations should cover the following four main topics :

(*a*) The basis of the military equipment of the Army, which is capable of being modified by the study of Allied experiences ; this is particularly the case with Allies who have recently entered into the War, and whose programmes are still in the formative stage.

(*b*) The adoption of the most suitable types in the Allied armoury in accordance with Allied experience.

(*c*) Specialisation of the various Allies on particular classes of output.

(*d*) Allocation and transport of raw materials for munitions to the various Allied countries.

(2) *Co-ordination of Existing Bodies.*—There is a second important duty to be carried out by the Council. A considerable number of inter-Allied organisations have grown up, some with executive and some with advisory powers. It is necessary to co-ordinate the work of all such specialised organisations concerned with munitions, and that their lines of policy be approved by the Inter-Allied Munitions Council. Those organisations and any further committees whose formation appears desirable should be subordinated to the main Inter-Allied Munitions Council, broadly speaking, in accordance with the annexed scheme.[1]

(3) *Sub-Committees.*—As regards the sub-committees indicated in the said scheme, it was agreed at the Paris Conference, in November, 1917, that a technical committee was required for the inter-Allied discussions on technical questions concerning war material, whose duty it would be to ensure an exchange of information on inventions, experiments and improvements, both in the realm of research and in that of production. This committee will be composed for each Ally of one design and one production officer, as it is undesirable to draw a sharp line between these two functions. This committee should be in a position to centralise a great part of the detached liaison work, which is going on between the several countries with regard to inventions, and the officers of the Munitions Department, as well as those from G.H.Q., who are dealing with these matters in Paris, should report to this committee. Experts may be added to the committee as required for the examination of special questions. The committee would be advisory only, the authorities responsible for design in each Allied country retaining their entire responsibility for the types adopted in each army.

[1] A copy of this scheme is given in Appendix II.

The Aircraft Committee which already exists will report to the main Council.

The Chemical Committee is also in the same position.

No committee yet exists on explosives, but it is necessary to create one to deal both with questions of allocation (on which there are very important questions outstanding on the extent to which we should supply Italy with high explosives and the extent to which America should be prepared to supply the European Allies with propellant in 1919) and with the use of economical mixtures. The Nitrate Executive should be subordinate to this committee, but would continue to meet in London, where its executive work is centred.

There is at present no definite non-ferrous committee, but constant meetings are taking place, and it is desirable that these should be put on an organised basis with subsidiary executives dealing with particular metals where required. As regards steel, at present there are arrangements in existence between particular Allies for the allocation of pig-iron and steel of various kinds. But these questions are not at present discussed as a whole. It is clearly desirable that the allocation of American and English steel resources should be considered by the main Council; but apart from the general duty of the secretariat to provide information on this subject, it will be necessary for the problems arising in connection with steel to be dealt with by a separate committee of the Council. This committee should have its headquarters in London.

There remains the question of railway material. There is at Versailles[1] an inter-Allied organisation for dealing with railway transport. This organisation cannot be subordinated to the Munitions Council, because transport is not with all the Allies a matter for the Ministers of Munitions. But a liaison should be established between this committee and the Munitions Council as regards railway material and raw materials therefor. And in order to enable the Munitions Council to obtain an inter-Allied opinion with regard to the comparative urgency of the Allied demands for the supply of railway material when it has to make its final proposals for the allocation of steel, the Inter-Allied Committee on Transport should be invited to collect for the Munitions Council the total requirements of all the Allies for railway material, whether for civil or for military purposes, and to grade these programmes in the order of their urgency.

This list of Committees is not intended to be exhaustive and could be added to as occasion demands.

(4) *Constitution of Council.*—The main Council will meet every month or six weeks in Paris. It will consist of the Ministers

[1] The Inter-Allied Transport Committee sat at Paris, not at Versailles. (M.C. 827.)

of Munitions, except in the case of the United States, which will be represented by a specially accredited representative of the United States Government.

The Ministers (and the American delegate) will be assisted by two members for each Allied country, of whom one should, if possible, be in residence in Paris; and in addition (in cases where the respective Ministers of Munitions consider it desirable) by a representative of the War Department, who will be a member of or competent to speak on behalf of the General Staff.

The Council will have a permanent secretariat, including a member appointed by each Ally. This secretariat will be responsible for receiving reports from the various Committees, circulating periodical summaries or memoranda to the various Governments, for following up the decisions and resolutions of the Council, and reporting progress to the Council.

The Inter-Allied Statistical Bureau will form part of the secretariat of the Council.

Between the plenary meetings of the Council referred to above it will be possible to summon, when necessary, smaller meetings of the members resident in Paris, or of delegates specially appointed for the purpose.

(5) *Reports.*—On matters appertaining to the Council, the secretariat will summarise information brought periodically up to date according to plan and in accordance with what experience will have shown the Council to be most in need of.

With this end in view, it will take as a starting point, other than the plan and general outline of the documents distributed by the Inter-Allied Statistical Bureau, the leading principles of the memorandum prepared by the Ministry of Munitions under the title of "Review of Allied Munitions Programmes."

It will make besides reports or special summaries on matters indicated by the Council.

The secretariat must obtain for the Inter-Allied Council on War Purchases and Finance and for the Inter-Allied Shipping Council all necessary documents concerning munitions and war material; in exchange it will receive all necessary information as to what course has been taken or proposed.

(6) *Powers of Council.*—As there is no precise definition of the powers of the respective Ministries of Munitions in each Allied country, it is agreed in principle that the powers of the Council will extend to all products having steel or other metals as a base, and to all chemical products, with the exception of such modifications as will have to be made to such a principle in order to take into account the varying conditions applicable to each country.[1]

[1] Hist. Rec./R/1010/13.

At this conference on 4 June, the American representatives had not been appointed, but Mr. Cravath and Mr. MacFadden attended in order to report to their Government. The members of the Council finally appointed were :—

France.—M. Loucheur, Minister of Munitions of War.
M. Dumesnil, Under-Secretary of State for Military Aeronautics.
General Mauclere.
Colonel Mercier.

Great Britain.—Rt. Hon. W. S. Churchill, M.P., Minister of Munitions.
Sir Charles Ellis, K.C.B.
Mr. W. T. Layton, C.B.E.
Major-General Sir W. T. Furze, K.C.B., D.S.O.

Italy.—H. E. Signor Nava, Under-Secretary of State for Munitions of War.
H. E. Signor Chiesa.
Signor Quartieri.
Lieut.-General Marquis Claverino.
Dr. A. Pirelli.

United States.—Mr. E. R. A. Stettinius, Assistant Secretary for War.
General Wheeler.
Mr. L. L. Summers, War Industries Board.

The standing committee at Paris consisted of Lieut.-Colonel De Grailly, Sir Charles Ellis, General Mola and Mr. L. P. Ordway.[1]

The exact scope of the work of the Munitions Council was under discussion with the British War Office, which wished its sphere of action to be limited to articles within the province of the Master-General of Ordnance. In view, however, of the acceptance by the War Cabinet of Mr. Chamberlain's scheme of programme committees to report to the Inter-Allied Council on War Purchases and Finance, it was agreed that the committees dealing with mechanical transport and with other important stores made mainly of steel, belonging to the Quarter-master-General's Department, should also be under the Munitions Council.[2] Otherwise it would have been impossible to obtain a complete review of the requirements of the Allies of steel, iron and other metals. The exact relations of the Inter-Allied Munitions Council to the Supreme War Council were also discussed and Mr. Churchill undertook to propose at the next meeting of the Munitions Council an addition to its constitution, which would establish :—

"(1) that the Inter-Allied Munitions Council should in principle report to the Supreme Council of Prime Ministers. Action will, however, proceed without the need of formal or special sanction in matters of routine ; (2) that while the military advisers on the Supreme Council will have no direct duties in connection

[1] HIST. REC./R/1010/17. [2] M.C. 827.

with the new Munitions Council, they shall nevertheless keep in closest touch in the following ways: (*a*) the military officers at Versailles considering questions of material should be authorised to attend meetings of the council if they so desire; (*b*) copies of all reports laid before the Munitions Council and in particular those containing and commenting upon Munitions programmes, should be circulated to the Military advisers of the Versailles Council."[1]

The second meeting of the Council was held in Paris on 14 and 15 August, when the chief points discussed were the scheme for supplying the American Army in France in 1919 and the organisation of the system of committees through which the Council would work. The scheme of committees had been left very incomplete at the first meeting, but the Council now took the effective step of appointing a standing committee of four members, one representing each Ally, who were to be resident in Paris. The committees dealing with different materials were also further developed,[2] the most important decision being that the Artillery and Small Arms Committee should consider questions of programme and supply as well as design and other technical matters. The extreme importance of the work to be performed by the Munitions Council was emphasised by two statements received from the Allied Maritime Transport Council and from the Inter-Allied Council on War Purchase and Finance. The former asked the Munitions Council to prepare schedules of shipping requirements, with the warning that American shipping was insufficient for American requirements until the spring of 1919 and that, in order to supply the American Army, the Allies must sacrifice some of their tonnage, reducing the importation of foodstuffs to a dangerous level during the winter and relying on the allocation of American tonnage in the spring to make good this sacrifice. The latter Council announced that it would allow no purchases in the United States by any Ally which were not supported by the Munitions Council.

The third meeting of the Council was held on 28 September to consider the programmes put forward by the committees. It was found, however, that the information was incomplete in many particulars, the most serious being the absence of the American artillery and ammunition programme. It was found possible, however, to draw up a statement of the total munitions requirements of Great Britain, France and Italy for the year 1 September, 1918, to 31 August, 1919.

With reference to the question of the relative priority of munitions and food an informal conference was held on 30 September with the Allied Maritime Transport Council and the Inter-Allied Food Council and again on 1 and 2 October with representatives of the Transport Council. As a result of these discussions the Transport Council

[1] M.C. 827.

[2] The Tin Executive was formed in August, 1918 (HIST. REC./R/600/18) and the Steel Committee presented its first report on 26 September, 1918 (HIST. REC./R/1810/76). The Rubber Sub-Committee met for the first time on 8 August, 1918 (M.C. 833).

in view of the shortage of shipping for the supply of the American Army, which was to rise to 80 divisions in 1919, decided to give priority to munitions over food for six months.[1] The Munitions Council also decided to establish a Tonnage Committee in London, which was to settle questions of priority in consultation with the Transport Committee and watch the actual shipment of all materials controlled by the Munitions Council.[2] The organisation of the Council by this time was practically complete, but before it had had opportunity to exercise any considerable influence on the supply of munitions, and prove the value of inter-Allied co-operation in this sphere the Armistice brought its operations to a close. The fourth and last meeting of the Council was held on 4 December, when it was decided to confine its operations within the strictest limits and to undertake no new policy in regard to questions relating to the supply of munitions during a time of peace.[3]

X. Finance.

The general financial arrangements that were established between Great Britain and those of the Allies who were in a less strong economic position included provision for munitions finance. Large credits were placed by the British Government at the disposal of the Russian, Italian, Belgian, Serbian and Portuguese Governments, the control of these funds being placed by the Treasury in the hands of the British section of the Commission Internationale de Ravitaillement. The Director was responsible for ensuring that no contracts were placed on behalf of these Allied Governments for munitions or other supplies, which were to be financed out of British credits, without first obtaining Treasury sanction. A Finance Section of the Commission Internationale was established, which, throughout the war, in spite of the opposition of the Ministry of Munitions, acted as the channel of communication between the Allied Governments and the Treasury. The Finance Section of the Commission Internationale also supervised contracts placed in Great Britain by private firms in Allied countries. Whenever possible, before a contract was placed which was financed out of British credits, the Finance Section obtained from the delegate of the Allied country concerned a statement of his Government's requirements in regard to materials of vital importance. The proportion of these requirements which could be met out of the available credits having been agreed upon, arrangements were made for the export of specific quantities, which were debited against the total credit allocated to the Allied Government for whom the goods were supplied.

The largest munitions transactions were with Russia and the bulk of the supplies provided from British credits had to be obtained in the United States of America, which greatly increased the difficulties of the Treasury in regard to the rate of exchange between Great

[1] From September to December inclusive 9,000,000 tons of munitions and raw materials were to be imported and 7,000,000 tons of food, including military oats.

[2] Hist. Rec./R/1010/13.

[3] Hist. Rec./R/1010/17. For the organisation of the Inter-Allied Munitions Council at the end of 1918, see Appendix III.

Britain and the United States. Purchases of steel for Italy were also financed by Great Britain in the United States.[1]

The Treasury maintained throughout the principle that its sanction must be obtained for each order placed by an Allied Government out of British credits. This hurt the *amour propre* both of the Russian Government and the Russian Commission in London and accusations of unnecessary delay in granting sanction for urgent orders were frequently made. The first financial agreement with Russia was signed on 1 September, 1915,[2] for the following year. Certain concessions were made by the Treasury during the year to facilitate certain small purchases. Thus, in March, 1916, the purchase of machinery and tools under the auspices of the Russian Commission was sanctioned up to a total of £500,000 in the first instance, without detailed scrutiny of the contracts. The condition was laid down that orders for machine tools were only to be placed through the Russian Commission in London, who were to scrutinise the orders to be placed in America before they were placed by the Russian Commission in New York, and all orders placed in America were to be debited against the total sum agreed for purchases of machinery.[3] The complaints of Treasury procrastination may have been to some extent justified, but a stiff attitude was undoubtedly the only possible method of keeping any control over Russian transactions. In order to save time, the Ministry of Munitions occasionally tried to evade the control of the Finance Section of the Commission Internationale. For instance, during the machine tool negotiations it was censured for having transferred a credit of $500,000 direct to the Russian Committee in New York without obtaining Treasury sanction or the approval of the Financial Delegate on the Russian Commission in London.[4] The War Office, while admitting the principle of Treasury sanction, found that allocations of material to one of the Allies on the Western Front had at times to be made instantaneously and without waiting for any formalities.[5]

A new agreement with Russia, relating to contracts to be placed in the United States out of British credits was signed on 14 July, 1916,[6] and a new general financial agreement was arranged during the following autumn. The Treasury, however, put a very wide interpretation on the original agreement for credits up to £54,500,000 and at the end of August, 1916, had given authority for the payment out of British credits of £40,000,000 beyond the amount to which they were pledged.[7] In 1917, on the reorganisation of the Russian committees, the responsibility for the financial sanction of orders to be paid out of British credits no longer rested solely with the Treasury, but was shared with the Cabinet Committee on Russian Supplies.[8]

The financial relations between Great Britain and her Allies were completely reorganised on the entry of the United States of America

---

[1] C.R. 4507.
[2] HIST. REC./R/1013/15.
[3] HIST. REC./R/1701.3/2.
[4] *Ibid.*
[5] C.R. 4322.
[6] D.D.G.(B).98.
[7] R.S.C./Gen./93.
[8] C.R.4322.

into the war. Each of the chief Allies negotiated a separate loan in America and thus obtained dollar credits from which their purchases in America were financed, so that Great Britain was no longer responsible for financing Russian or other Allied contracts in the United States.

Although these separate loans were arranged, the United States Government was insistent that finance as well as munitions and other requirements should be scrutinised by a joint Allied organisation in Europe, so that credits as well as supplies could be allocated to the different Allies to the best advantage. For this purpose the Financial Section of the Inter-Allied Council on War Purchases and Finance was established early in March, 1918, composed of the Chancellor of the Exchequer, the Finance Ministers of France and Italy and the President of the Council, who were to meet at least once a month. A permanent financial secretariat was also established at Paris. The Financial Section was competent to discuss all questions relating to (*a*) the mutual financial support lent to each other by the Governments of Great Britain, France, Italy and the United States; (*b*) the obtaining of means of payment for the benefit of these Governments in neutral countries, (*c*) the financial help to be granted in the form of loans, or in any other form, by the four Governments to other Allied Governments.[1]

In May, 1917, Mr. Keynes, the Treasury representative on the Committee on Russian supplies, reported that, though the Russo-American loan was not finally arranged, all new Russian orders would be financed by the United States of America. The American Government was also expected to take over outstanding commitments on Russian munitions orders already placed, and also to meet the liabilities, so far met by Great Britain, on orders placed in the United States on Russian account since the American declaration of war.

Owing to exchange questions and the difficulty of finding enough dollars to finance purchases made by Great Britain on behalf of her Allies, the Treasury pressed for transfers being made to the British Government from Allied dollar credits in payment for the raw materials purchased by Great Britain in order to make munitions for the Allies in the United States.[2] The principle was accepted in a particular instance by France, but the Committee on Russian Supplies had to take up a strong attitude with regard to the payments for raw materials for Russian ammunition. It was decided on 23 October, 1917, that the production of 7·62 mm. ammunition for Russia must be discontinued after 31 December, 1917, unless reimbursement was made.[3] Events in Russia, however, brought this matter to a settlement, and on 14 December, 1917, the Russian Commission in London was informed that by a decision of the War Cabinet, the manufacture of munitions out of British credits was suspended.[4]

---

[1] Hist. Rec./R/1010/23.
[2] C.R. 4357.
[3] *Ibid.*
[4] C.R. 4356.

The general question was taken up by Mr. Churchill in a letter, dated 6 February, 1918, to Mr. Crosby, the American delegate to the Inter-Allied Council, in answer to a request for a programme of British munitions requirements. He pointed out that—

> " In estimating American credits which are available for Great Britain, regard must be had to the large and continuous supply of material of all kinds we have been, and still are, giving to the Allies . . . . . the whole of it was obtained at the expense of British credit, with the result that we have become dependent upon American credits at a much earlier date and to a larger extent than otherwise would have been the case. It would appear right that for the future we should receive an equivalent credit in the United States from the subventions to France and Italy for any further supplies we may have to make to them. . . . . "

Mr. Crosby replied that according to the view of the United States Treasury, the requests put forward by an Ally for advances from the United States for a certain period and the allotments which would be made, assumed the continuation during the period in question of the advances which Great Britain had been making, so that those advances would be taken into consideration in determining the allotment to Great Britain to be made by the Inter-Allied Council. This, therefore, did away with the need of any transfer of dollar credits to Great Britain. In the future, however, if Great Britain in addition to carrying out the pre-arranged programme should supply an Ally with a portion of the munitions which she was buying in America, thus reducing the purchases of that Ally in America, then a corresponding transfer of dollar credits to Great Britain would be in order.[1]

The policy with regard to the prices charged for materials supplied to the Allies by the British Government varied considerably at different times. During the first two years of the war the munitions purchased in Great Britain by the Allied Governments were generally manufactured to special specifications, so that it was impossible to compare the prices paid with British prices. The contracts were placed by special missions sent to Great Britain, and even when purchased out of British credits, although Treasury sanction had to be obtained, no restrictions on price were made by the British Government. Later the Ministry of Munitions encouraged the Allies to place their contracts so far as was possible through the Ministry supply departments : low prices were in the interests of the British Government, as otherwise the contracting firms gave precedence to foreign orders. The general policy as set forth by the Treasury (11 December, 1916)[2] was that where goods of British type were supplied or allocated out of War Office stores, the Allies were to pay rate book prices, but where goods or material were bought by Great Britain on behalf of her Allies the prices charged were to be the actual cost with a small additional charge for inspection, handling, storage, carriage and insurance, but generally speaking, the Allies were not to be asked to pay for administrative and purchasing expenses.

---

[1] M.C. 827. [2] 29129/16 in C.R. 4442.

The amount charged was not to be a concealed subsidy at the expense of the British taxpayer, but profits were similarly to be avoided. There were occasional variations from this policy. Thus, pig-iron and steel was sold to the Allies at prices based on the maximum fixed British rate, with an additional charge to cover extra expenses and, in addition, a small merchant's profit agreed between the Allied Governments and the British contractor.[1] Later, an extra charge to represent the subsidy borne by the British Government was added.[2]

The French Government, on the other hand, originally charged the war material supplied to the Allies at cost price. In June, 1916, however, M. Loucheur informed the Ministry of Munitions that this acted very inimically to the interests of the French manufacturers and that he had decided to raise the prices charged by the French Government. The exact amount was not yet decided, but in no circumstances would the extra charge exceed 20 per cent. of the price paid by the French Government to the manufacturer.[3]

When negotiations were made for the purchase of all Allied supplies in America through the American Purchasing Commission, the United States Government proposed to charge the same prices to the Allies as the War Industries Board paid for their own materials, on the condition that all the Allies charged both the United States and one another the same prices for all war materials. As shown above, the British Government already carried out this policy with regard to finished munitions, and the Ministry decided, in August, 1917, to fix the prices charged for pig-iron and steel at a rate representing as nearly as possible the actual cost, including subsidies, but excluding the administrative charges and small profit hitherto allowed for.[4]

The Treasury, however, felt that something ought to be done to prevent the Allies from buying large quantities of steel and pig-iron in England, which, owing to the shortage, had to be replaced by purchases in North America at considerably higher prices.[5] On 14 August the Ministry asked whether it would not be possible to make an arrangement by which France and Italy could be assured of adequate supplies of iron and steel from America, so that all home supplies might be retained for British use. A considerable saving both in tonnage and money would result. The prices charged to France—£8 11s. for hematite pig-iron and £16 10s. for shell steel—were far lower than the cost of American supplies delivered in England, pig-iron costing about £12 10s. at blue book rates of freight and £18 at market rates, while the cost of shell steel was about £26 per ton. Supplies to the Allies were on a considerable scale. There was a standing arrangement with M. Thomas, made in 1916, that Great Britain should supply France with 35,000 tons of hematite pig-iron per month and 10,000 to 12,000 tons of shell steel, though actual supplies had fallen short of this amount,

---

[1] M.C. 110.
[2] Vol. VII, Part II.
[3] Hist. Rec./R/1010/24.
[4] M.C. 110. For further details see Vol. VII, Part II.
[5] 23 May, 1917 (M.F./Gen./546).

especially in the case of pig-iron. The Italian contracts for shell billets or forgings were nearing completion. There was a general agreement to supply 6,000 tons of hematite pig-iron per month, but actual supplies had fallen short of this amount. Taking these facts into consideration, it was estimated that if the Allies had to obtain all their supplies from America it would mean a saving of £10,000,000 a year to the British Government.

A Council Committee, which consisted of Sir Laming Worthington Evans, Sir Charles Ellis, Sir Ernest Moir, Mr. (later Sir Sigmund) Dannreuther and Mr. Walmsley, reported that the supply of pig-iron and shell steel to the Allies should be regulated by the following considerations :—

(1) All financial transactions between British and Allied Governments were to be based on the principle of actual cost.

(2) When the fulfilment of the Allies' requirements necessitated replacement by purchases in America, the price to be charged to the Allies was to be the price paid by the British Government for replacement.

(3) The Allies were to be asked to pay for such materials out of dollar credits extended to them directly by the American Government instead of out of British sterling credits.

(4) These conditions were not to be retrospective, but to apply to all future deliveries.

At a meeting of the Munitions Council on 26 September these recommendations were adopted by the Minister.[1]

In June, 1918, the Treasury again returned to the subject, urging that the Allies should place all their orders for materials which required direct or indirect replacement from the United States direct with the United States. Both the exchange of materials and the repayment by the Allies in dollars were unsatisfactory, the one owing to the waste of British shipping, the other on account of the difficulties and delays raised by the United States Treasury. The burden of making the necessary arrangements for dollar reimbursement should fall on the Allies in advance of the supplies being made, not upon Great Britain after the event, when, as experience showed, the chances of success were remote.[2]

In the convention arranged between Great Britain and the United States in October, 1918, it was agreed that as nearly as possible all these transactions should take place without profit and without loss.[3]

---

[1] M.F./Gen./526.
[2] D.M.R.S. 465 D. ; C.R.V./I/067 ; see below p. 54.
[3] Hist. Rec./R/1014/4.

CHAPTER III.

SUPPLIES FROM GREAT BRITAIN TO THE ALLIES.[1]

I. Survey.

(*a*) General Policy.

The competition between the Allies which characterised their early efforts to obtain war material and munitions ultimately gave place to a common policy by which control of the purchase in neutral markets of war material which showed signs of being inadequate to meet demands, tended to become centralised in the hands of the British Government. The metal purchases were the most notable of those made centrally by Great Britain,[2] and in addition large quantities of British iron and steel were supplied to the Allies throughout the war. The system of buying centrally, though open to certain objections,[3] the chief of which was delay, was most advantageous on the whole. For instance, wolfram was bought at 60s. per unit, whereas the price in the United States had been 250s.[4] In addition to checking competition and speculation, it tended to diminish prices to the Allies in another way by giving them the support of British credit. This was specially valuable in the case of Russia. For instance, aluminium for Russia was bought through Messrs. Morgan at £231 11s. per ton when Russian negotiators were being asked £252 12s. for the same article.[5] In 1916 the Americans under pressure agreed to sell nickel to the British Government for supply to the Allied Governments at the same price as for use in Great Britain, thus saving £50 per ton.[6]

The general policy with regard to completed munitions manufactured in Great Britain was to fix a minimum requirement for home needs[7] plus a margin for insurance and to allocate any surplus among the Allies,[8] but this attitude towards Allied requirements evoked

---

[1] A table given in Appendix V, summarises all the available statistical information as to supplies to the Allies.

[2] See below, pp. 59–63.

[3] *e.g.* The rather cumbrous machinery involving reference to different offices often delayed purchases and led to the enforced payment of a higher price (D.D.G.(B) 68). On the other hand, when by agreement all Allies refrained from buying American acetone so as to force down the price, the Italians by making independent enquiries sent the price up still further. (D.M.R.S. 461.)

[4] Sir L. Llewelyn's Papers, 300. (These unregistered papers are now filed in the Archives Registry.)

[5] *Ibid.* The copper deal of September, 1916, resulted in a saving of nearly £5 per ton on the April price. (Hist. Rec./R/1011/4.)

[6] Sir L. Llewelyn's Papers 300.

[7] C.R. 4457.

[8] *Cf* the story of rifle allocation which provides a good instance of this method, Vol. XI, Part IV.

considerable criticism. In October, 1915, Mr. Booth, Deputy Director-General (B), wrote :[1]

> "As I see the present position we are aiming to supply to the British forces not only a great deal more than they ask, but such quantities as tend greatly to hinder the supply of bare necessities to the Allies. . . I would endeavour . . . to manufacture proportionately to the Allies' requirements. . . .We have offered to finance our Allies, we have urged our Allies to put their buying arrangements in our hands : it is unthinkable that at the same time we should inform them that we have monopolised every possible source of production."

The importance of the Eastern Front and the inadequacy of Russian armament led the British seriously to consider the advisability of sharing output, at any rate in the case of guns,[2] but, generally speaking, until the entry of the United States into the war the policy of allocating[3] only surplus munitions was maintained. By this time material was short, and shipping a critical problem, but munitions production had been organised on a sound basis, programmes were arranged well in advance, and the unity of the Western Front was becoming a familiar idea. Aided therefore by the financial stringency a policy was developed which, by November, 1918, was based on international conference and the allocation of tonnage, materials, and munitions by means of a representative council.[3]

In the autumn of 1918 Great Britain still made purchases on behalf of the Allies, but the Allies agreed that the value in dollars should be placed to British account or arrangements made for replacement in kind at a later date. Similarly, Great Britain still manufactured munitions for the Allies ; but, save in very exceptional circumstances, unless the raw material was produced in England, the Allies were expected to buy and ship to England the material required for manufacture. Where manufacture was undertaken for America elaborate arrangements for replacement in kind were made. For instance, the material used in making guns and ammunition was to be replaced by the shipment of additional shell steel, with explosives and propellants, or of complete rounds of ammunition, while for 6-in. Newton bombs an equivalent tonnage of iron was to be sent.[4] Exchanges on a less highly organised basis were frequently arranged throughout the war. For example, in July, 1917, French contracts with British firms for the supply of certain shell components were allowed on the condition

---

[1] Hist. Rec./R/1010/10.

[2] C.R. 4457.

[3] The general principle may be illustrated by the words of M. Clementel, " In accordance with the principles which have gradually prevailed, the respective needs of the Allies have been satisfied not in accordance with the immediate necessity of each one, but in proportion to the needs of the others. Moreover the allocation of indispensable products is conducted by taking into account the total quantities available and not the right which ownership of the supplies confers on the country to which they belong." (M.C. 837.) See also Treasury letter of 8/9/17 in M.C.829.

[4] For other examples see A.B./Gen./211 ; Hist. Rec./R/1014/4.

that an equivalent weight in copper to that used should be handed over in America by France to Great Britain.[1] Other exchanges arranged were French perchlorate of ammonia for toluene-benzene, to be sent from Rotterdam,[2] and synthetic phenol for carbolic acid.[3]

Throughout the war Great Britain took a prominent part in the development of new types of munitions,[4] both supplying her Allies and assisting them in their own manufacture. The supply of munitions and materials to her Allies on this large scale involved Great Britain in many special difficulties. To avoid loss by submarine various expedients were tried, as for instance, the export of goods to Russia *via* Sweden and Finland.[5] The proposition, however, made in 1918, to transport tin from the East across America was rejected, as the idea of having practically the whole tin supply stored even temporarily in America was most uncongenial to the British Government, and the proposal to carry ores from Greece overland through France fell through owing to the congested state of French railways.

Manufacturers were often hampered by the difficulty of working to foreign specifications.[6] The steel made for France in South Wales was a notable example, and the exacting Russian specifications made the procuring of brass scrap almost impossible.[7] Wherever practicable, the Allies were pressed to accept British specifications, as in the case of brass for Italy, in November, 1916,[8] and in February, 1917, when the French agreed to take the nearest British dimensions for the supply of shipbuilding steel.[9] The difficulties incident to inspection of Russian munitions in America were notorious; "captious technical objections" made the supply of motor transport an anxiety, and occasionally goods ordered proved unfit for the country to which they were sent.[10]

---

[1] (Printed) *Weekly Report*, No. 102, XI (28/7/17). In September, 1916, M. Thomas suggested the exchange of British 6-in. howitzers for French long range guns, as being likely to "have a great moral and political effect in France." (HIST. REC./R/1000/105.) A large number of proposed exchanges fell through owing to the financial and shipping stringency and unforeseen difficulties in production. For other instances see below, p. 66.

[2] HIST. REC./R/1501/1.

[3] *Ibid.*

[4] See below, pp. 72, 76.

[5] The attitude of the Swedish Government made this method, at best, precarious, though there is no reason to believe that there was any diversion of goods to Germany (C.R. 4322).

[6] HIST. REC./R/1010/10. In November, 1916, the Explosives Dept. could get no British firm to quote under Roumanian specifications. (D.M.R.S. 424.)

[7] D.D.G.(B). 101; HIST. REC./R/1013/9.

[8] HIST. REC./R/1012/4. See also p. 62. A suggestion in October, 1916, that there should be a common specification for steel bought in America for France, Italy and England, so as to avoid the necessity of frequent changing of rolls was not received with much enthusiasm in France, and was therefore dropped. (HIST. REC./R/1800/2).

[9] D.M.R.S. 410.

[10] HIST. REC./R/1013/15; C.R. 4502; (Printed) *Weekly Report*, No. 105, XI (18/8/17).

There were many other difficulties. Independent action upset neutral markets and either prevented the conclusion of a favourable purchase or sent up the price,[1] while it was sometimes impossible to get Allied Ministries to submit their programmes in sufficient time to avoid competition or bring about co-ordination.[2] Old established trade connections and the problem of international rivalry in after-war trade had also be to considered. Departmental intricacies made for delay,[3] and international jealousy and suspicion had to be combated. The Allies suspected each other of unnecessary extravagance in the use of vital materials, or that supplies were being put to non-military uses.[4] The greatest pressure was sometimes needed to induce Allies to substitute some effective but less scarce commodity, Russia being the worst offender.[5] Again, ill-feeling was raised by rumours that England was holding back stores,[6] or was buying material to compete with American industry after the war.[7]

(*b*) BELGIUM.

Supplies to Belgium largely consisted of completed munitions, and apart from deliveries from direct contracts placed in England early in the war, issues generally took the form of transfers from the British Expeditionary Force.[8] Especially was this the case in the early part of the war. In the last two years, however, the Ministry of Munitions made considerable direct allocations of small arms ammunition and grenades, together with explosives, and explosive material and metals.

(*c*) FRANCE.

The enemy occupation of the French mining districts rendered France throughout the war largely dependent upon British supplies of iron and steel, and products derived from coal tar. France and Great Britain, however, were able to help each other in the supply of munitions ; *e.g.*, while Great Britain made machine guns and small arms ammunition for France, France supplied Great Britain with aeroplane engines and optical munitions, while a large number of exchanges were arranged.[9] In negotiations for purchases in neutral markets competition was eliminated so far as possible, as for instance, by the allocation of different markets to one or the other country, as in the case of wolfram.[10] In supplying other Allies, joint action between

---

[1] D.D.G.(B).108 ; HIST. REC./R/1013/15.
[2] D.M.R.S. 518 P.
[3] See C.R. 4502 for criticism on the methods of the Russian Purchasing Committee. In January, 1917, Gen. Hermonius complained of the long delay in getting machine tool orders through some 26 clerical stages.
[4] M.C. 837.
[5] Sir L. Llewelyn's Papers, 508.
[6] C.R. 4426.
[7] M.C. 230. Cable N.Y. 53109.
[8] HIST. REC./H/1010/3.
[9] See below, pp. 63, 65, 66.
[10] HIST. REC./R/1010/38.

France and Great Britain was arranged where possible, as in the case of Russia and the United States,[1] and by her agreement to undertake the armament of the Balkan Allies, France relieved Great Britain of much responsibility.

(*d*) RUSSIA.

Russian claims on British resources were on a comparatively small scale until Lord Kitchener's mission obtained permission in May, 1915, to place orders for large quantities of finished munitions. Thereafter demands for completed munitions, particularly for heavy guns and for material of all kinds, notably railway material, poured in.

The bulk of the orders (which were financed out of British credits) were placed in America.[2] Negotiations, however, were so full of complexity[3] that contractors were often unwilling to take Russian orders.[4]

The problem of shipping Russian supplies was very serious, Archangel, the only available port of any size, being ice-bound during a large part of the year. The assignment of tonnage was rendered more difficult by unreliable figures and uncertainty as to the relative importance and urgency of the demands, which were on an impossibly large scale.[5] The British Government was anxious to encourage Russian production of munitions, and for this reason supplied plant and machinery on a large scale, but the schemes had borne comparatively little fruit when the Russian Revolution broke out. During the months that followed supplies to Russia were gradually diminished, and by December, 1917, there was no British capacity employed on Russian contracts.

(*e*) ITALY.

The entry of Italy into hostilities in May, 1915, brought fresh demands on the Alliance. Her lack of mineral wealth was such that she was dependent on foreign supplies of iron, steel, non-ferrous metals, and raw material for explosives.[6] The import of these commodities was regarded as a military necessity, and the 1917 and 1918 requirements were very heavy. Steel and iron were the vital problems. Supplies were urgently wanted for shipbuilding as well as for munitions, but the shipping shortage reduced British supplies, and in September, 1918, Italy stated that the country during the last twelve months had been starved for steel.[7] It was possible to meet

---

[1] See below, p. 65.
[2] HIST. REC./R/1013/15; R.S.C./Gen./35.
[3] HIST. REC./R/1411.3/2. See below.
[4] HIST. REC./R/1013/6, 15.
[5] With existing orders the demands put forward for 1917 amounted to about 13,000,000 tons, of which only about 4,500,000 tons were available. The capacity of Russian ports and railways for dealing with the munitions which could be provided was also a problem to be considered. (C.R. 4457 and HIST. REC./R/1013/14.)
[6] HIST. REC./R/1012/1.
[7] HIST. REC./R/1010/30.

practically the whole demand for explosives and their raw material,[1] but at the end of 1917 negotiations were hindered by financial difficulties between England, Italy, and the United States, and by the question of transport. Fortunately, Italy was in a position to manufacture many of her munitions, and on the whole only required supplies of new arms, such as trench mortars,[2] until her own production was started. After the disaster at Caporetto, however, large supplies of all kinds of munitions and materials were sent out to make good the losses.[3] The Italian programme for 1919 was on an enlarged scale in view of a possible spring offensive, and made considerable demands on British resources.

(*f*) United States of America.

The United States programme, while making few claims on British manufacture during 1917, was very heavy for 1918 and 1919, when the Americans hoped to have 80 divisions in the field.[4] Coming at a time, however, when Russian demands had ceased and supply was well organised, it appeared possible successfully to meet American demands from British resources in spite of the shortage of material and shipping. The supply of guns, ammunition and trench warfare stores of British pattern, aviation material and transport was undertaken by Great Britain on a large scale.

As soon as America came into the war a British Artillery Mission was sent out to give technical help, and many stores were sent to New York, especially in connection with trench warfare, to guide the American Ordnance Department in manufacture. Specifications and drawings were also despatched.

(*g*) Balkan Allies.

The demands from the Balkan Allies were largely met by the French Government.[5] England, therefore, made but small contribution to the munitioning of Serbians, Roumanians and Greeks. Other than supplies handed over by the British Expeditionary Force, grenades issued by the War Office were practically the only store sent to Serbia.[6] Similarly, Roumania, who had made a regular supply of munitions a condition of entry into hostilities,[7] received only miscellaneous stores, of which the most important were machine guns and ammunition.[8] Some attempt indeed was made by the British and

---

[1] Hist. Rec./R/1012/4.
[2] See below, p. 72.
[3] Hist. Rec./R/1012/3. See below. The Allies received no complete information of requirements after the Caporetto disaster, and had assumed no collective responsibility for the help given, and by September, 1918, the problem of Italian supplies was still very serious (M.C. 837).
[4] Hist. Rec./R/1010/30.
[5] Hist. Rec./R/1010/39; D.M.R.S. 424; D.D.G.(B) 77.
[6] Hist. Rec./H/1010/3; /R/1010/37.
[7] D.M.R.S. 424; D.D.G.(B) 77 · D.D.G.(C)./C.M.G./097.
[8] See below, pp. 70, 72.

French to arrange co-ordination of purchases,[1] but difficulties were so great,[2] and the uncertainty following the retreat of December, 1916, such that practically no requisitions reached Great Britain, and general feeling among the Roumanians was one of disappointment at her attitude.[3]

Greek demands were also submitted through the French officer in command,[4] but howitzers, transport, aeroplanes and some steel were shipped from England and certain stores handed over by the British Expeditionary Force.

(*h*) PORTUGAL.

The Portuguese demands submitted in the early part of 1916 were large and varied in character, but in spite of the wish of the Portuguese Government to obtain raw material for the development of their own munitions resources, and to use British types of munitions so as to ease supply,[5] the position at the time did not admit of much British assistance, and apart from purchases effected abroad, only small quantities were supplied to Portugal.

II. Supply of Materials.

(*a*) IRON AND STEEL.[6]

The supply of steel was one of the most difficult problems which the Ministry had to face, as it fell upon Great Britain to supply or arrange supplies for most of the Allies. Production was also complicated by the necessity of obtaining ores from neutral countries. The chief supplies of steel were made to France, to whom nearly 3,000,000 tons were issued.[7]

Several contracts for steel were placed privately in Great Britain. For instance, France had various orders for iron and steel goods,[8] and especially had arranged contracts for shell steel in South Wales, but in March, 1917, the Ministry undertook to supply a regular monthly quantity of from 40,000 to 48,000 tons though this figure could not be reached in 1918 owing to tonnage scarcity. Italy also had a contract for 3,000 tons per week of British shell steel. This contract expired in April, 1917, but Great Britain promised to continue the supply if possible. The British Government also supplied the steel for the manufacture of French, Russian, Italian, Belgian and Roumanian[9] shell in England.

The shortage of shell steel became apparent in the spring of 1916, and by August the utmost caution was needed in distribution.

---

[1] D.M.R.S. 424.
[2] HIST. REC./R/1015/1; D.M.R.S. 424; C.R. 4502; D.D.G.(B) 108; C.R. 4320.
[3] C.R. 4457.
[4] D.M.R.S. 545.
[5] D.M.R.S. 429.
[6] See Vol. VII, Part II.
[7] HIST. REC./H/1010/3.
[8] (Printed) *Weekly Report*, No. 107, XI (1/9/17).
[9] Otherwise Roumanian demands were not met. (C.R. 4457.)

Earlier in the war the French and Italians bought steel independently in the United States, but in the middle of 1916 the British Government began to buy for both countries and a number of orders were placed,[1] but at the end of 1916 a steel famine in America was reported, and it was considered impossible to meet more than two-thirds of the Allied requirements for the last half of 1917.[2] In fact, during 1917 there was a perpetual shortage of shell steel, aggravated by the needs of the aeroplane, tank and shipbuilding programmes. In the summer of 1917, to meet British shipbuilding requirements, the export of steel to France and Italy was reduced, but compensation for shell steel was arranged in the form of tonnage for the shipment of American steel. After the Italian retreat in the autumn of 1917 the Italian shell steel allocation was increased,[3] but the French allotment for 1918 was cut down from a demand for 88,000 tons per month at first to 39,000 tons and then to 11,000 tons per month.[4] As a result of the reduction in munitions programmes decided upon in February, 1918, both France and Italy were informed that after June, 1918, no further shipments could be made from Great Britain, and that purchases must be made entirely in the United States, except in the case of certain special steels which were only to be obtained in Great Britain.[5] This decision brought many protests, and eventually supplies were continued at the rate of about 10,000 tons and 7,000 tons per month respectively to both countries. To supply the requirements of the United States Army in Great Britain, *e.g.*, for artillery, ammunition and emergency demands for repair shops, hospital sheds, etc., the equivalent amount of steel was shipped from America.[6]

Considerable demands were received from the Allies for all kinds of special steel, and were met to a large extent, while high-speed steel was in great request and was exceedingly difficult to supply.[7] Italy, in particular, was practically dependent on Great Britain for nickel-chrome and nickel-chrome steels, and considerable exports were made to France, Russia, Belgium and Japan.[8]

Iron and steel tubes were also supplied for the French, Italian and Russian Navies. By 1918 the demand for tubes was 2,000,000 ft. per month.

A certain amount of constructional steel and shipbuilding steel was also exported to France and Italy,[9] and in 1918 requirements of the

---

[1] Hist. Rec./H/1010/3.

[2] It was thought that British demands might be met by taking part of the order in cast steel ingots instead of rolled steel, but this arrangement could not apply to French and Italian requirements.

[3] 18,000 tons per month was promised for the first half of 1918 and 120,000 tons during the second half of 1918, but this amount was found to be impossible.

[4] During 1917 the average monthly export of steel from Great Britain to France had been 84,400 tons, of which 39,400 had been shell steel. (Hist. Rec./R/1010/20.)

[5] Hist. Rec./R/1010/3; D.M.R.S. 410.

[6] *Ibid.* and (Printed) *Weekly Report*, No. 116, XI (3/11/17).

[7] For supplies during the early months of 1916 to the Allies, see Sir L. Llewelyn's Papers, 300.

[8] C.R. 4426; Sir L. Llewelyn's Papers, 508.

[9] C.R. 4426.

Allies for general steel amounted to 100,000 tons a month,[1] but the amounts were drastically reduced when the cuts were made in the winter of 1917-1918. Steel scrap was very short in England, but in 1917, Great Britain promised to buy scrap for Italy from the United States or to supply the money.[2] A certain amount of steel was also exported to the Allies in the form of manufactured goods.[3]

At the time of the Armistice, the programme for 1919 was not complete, but a total of 525,000 tons was provisionally allocated for Allied requirements during the year.

During 1916 and 1917 a large quantity of hematite pig-iron was supplied to the Allies,[4] and efforts were made to replace such allocations by imports of basic pig-iron from the United States.[5] This arrangement was continued through 1918, in spite of the decision that Allies should import their requirements direct, as the basic pig-iron which the United States chiefly produced was not suitable for French and Italian requirements.[6]

In addition to iron and steel, the provision of chrome-ore and ferro-alloys was undertaken. From her own possessions, Great Britain sent varying amounts of chrome ore to the Allies, and large quantities were also sent to France, to be returned in the form of ferro-chrome for the manufacture of high-speed steel.[7]

To avoid complications, Italian and Russian demands for ferro-chrome were, therefore, referred to France,[8] but ferro-manganese,[9] ferro-silicon and spiegel-eisen were exported to France, Italy and Russia.[10] Ferro-manganese was also issued to the United States, a little ferro-silicon was sent to Belgium, and a considerable amount of manganese ore to France, Italy and the United States.[11]

Wolfram was purchased by Great Britain from sources within the Empire and in neutral countries,[12] but tungsten was exported to France, Italy and Russia.[13] In November, 1915, it was arranged that France

---

[1] France, 84,200 tons; other Allies, 15,900 tons.
[2] C.R. 4426.
[3] D.M.R.S. 503.
[4] HIST. REC./H/1010/3.
[5] (Printed) *Weekly Report*, No. 100, XI (14/7/17); No. 102, XI (28/7/17.)
[6] HIST. REC./R/1010/30. The United States were to supply Great Britain with 500,000 tons of basic pig-iron, and in exchange, the British were to supply France and Italy with an equivalent tonnage of hematite, etc. (D.M.R.S. 410.)
[7] Vol. VII, Part III, Chap. IX; HIST. REC./H/1010/3; D.M.R.S. 518 P.; M.C. 832; Sir L. Llewelyn's Papers, 508.
[8] Sir L. Llewelyn's Papers, 508; M.C. 832.
[9] A considerable amount was also sent to the United States, Norway and Sweden for manufacture into steel for the Allies.
[10] HIST. REC./H/1010/3.
[11] *Ibid.*
[12] For difficulties in connection with the importation of wolfram, see C.R.4502.
[13] C.R. 4457; M.C. 832. In 1918, it was decided that Italian requirements should be met by France.

in addition to her share of neutral production, should receive a third of the output of the British Empire,[1] and in 1916 it was agreed that Russia, after receiving 65 tons from France, should be supplied by England at the rate of 25 tons per month.[2]

(*b*) Non-Ferrous Materials.[3]

The extent to which Great Britain met the demands of her Allies for non-ferrous metals and materials varied with the sources of supply. In some cases, such as tin, Great Britain was able to arrange large supplies throughout the war from her own resources; in others, such as copper, resin, lead, platinum, abrasives, mineral oils, she had to import all or most of her requirements, but made large purchases abroad on behalf of the Allies, especially Russia. For instance, to supply the Russians, brass, aluminium,[4] lead,[5] spelter and nickel[6] were bought in America, graphite in Madagascar, and antimony in China; and in 1917, owing to partial release from dependence on foreign supply, Great Britain transferred to Russia a Scandinavian contract for spelter. Apart from supplies of copper and tin,[7] only small quantities of non-ferrous metals were sent to Belgium and France,[8] but Italy was furnished with considerable quantities of most of the non-ferrous materials, and purchases of brass were made in the United States on her behalf.[9]

Great Britain took charge, in November, 1915, of the negotiations for all the copper required by France, and from May, 1916, undertook to satisfy, so far as was possible, the requirements of all the Allies.[10]

Nickel, cobalt, shellac and especially tin, were produced largely in British possessions and Great Britain was in a far stronger position for supply. Of the Indian output of shellac 20 per cent. was reserved for the Ministry, who set aside 40 per cent. for the Allies. From the end of 1915, Great Britain bought large quantities of Canadian nickel for Russia, and smaller grants were made to other Allies, *e.g.*, Japan and Italy. The bulk of the tin supply was in English hands. France was practically dependent on Great Britain and made heavy demands in 1916 and 1917.[11] A considerable amount was also despatched to Italy and Russia,[12] and the demand in 1917 and 1918, from the United States, especially for canned food

---

[1] Hist. Rec./R/1011/41, 1800/6.
[2] C.R. 4502.
[3] See Vol. VII, Part III.
[4] Hist. Rec./H/1010/3.
[5] (Printed) *Weekly Report*, No. 101, XI (21/7/17).
[6] Hist. Rec./H/1010/3.
[7] Vol. VII, Part III, Chap. VII.
[8] Hist. Rec./H/1010/3.
[9] C.R. 4457; Hist. Rec./R/1010/20; Hist. Rec./H/1010/3.
[10] *e.g.*, in the year ending May, 1917, 468,000 tons were purchased in America, of which only 206,000 tons were for home supplies.
[11] 10,877 tons were licensed in 1916, and tonnage at the rate of 18,000 tons per annum during 1917.
[12] Hist. Rec./H/1010/3.

production was so heavy, that it was arranged that after a minimum for British needs had been provided, the United States was to draw 60 per cent. of the Straits output in 1918. During 1918, however, the supply, which had hitherto sufficed to meet needs, showed signs of becoming inadequate, and towards the end of the year allocations to the other Allies were restricted.

Loans were not infrequently made, as, for instance, 1,250 tons of aluminium and 3,000 tons of copper to Russia. Copper was also lent to France.[1] Occasional grants were made to meet an emergency, as, for instance, the loan of 50 tons of nickel to France,[2] and the sale of aluminium to Italy, pending the development of her own manufacture. A special arrangement was the sale to the United States of some surplus platinum in Great Britain, with the purpose of keeping America out of the Russian market.

Of miscellaneous material, rubber was not controlled by the Ministry of Munitions until August, 1918, when the supply of raw and waste rubber to the Allies was undertaken.[3] Shipments from England to Italy were sanctioned for the autumn of 1918, although the re-shipping of material which had once passed the danger zone was considered inexpedient.[4] Rubber was also sent to France, Belgium, Japan, Portugal and United States.[5]

A large number of silica bricks were sent to France and considerable supplies to Italy and Belgium.[6] In the early part of the war, however, France and Italy appear to have placed orders privately in England, but in the middle of 1916 the Ministry undertook the allocation of supplies. In 1917, however, the French were allowed to place an order for 1918.[7]

Magnesite bricks were also sent both to France and to Italy, Great Britain offering in September, 1915, to supply France with bricks if the French could assist with the magnesite needed.[8]

Large requirements of wire from Russia were dealt with, chiefly by purchases in the United States.[9]

(*c*) EXPLOSIVES, PROPELLANTS AND CHEMICALS.[10]

The position of Great Britain was specially favourable for the manufacture of explosives because of her coal fields, which provided

---

[1] C.R. 4432.
[2] HIST. REC. /R/1010/30.
[3] M.C. 833.
[4] D.M.R.S. 410; D.M.R.S./A.S./697.
[5] The value of rubber exports was £800,000 in the case of Italy; £900,000 of France; the other Allies taking small quantities only. (HIST. REC./R/1010/37.)
[6] HIST. REC./H/1010/3.
[7] C.R. 4426; HIST. REC./R/1800/6. (Printed) *Weekly Report*, No. 102, XI (28/7/17).
[8] HIST. REC./R/1011/2, 1800/6; C.R. 4426.
[9] C.R. 4457, 4320; HIST. REC./R/1013/14; D.M.R.S. 410.
[10] Vol. VII, Part IV.; Vol. X, Part IV.

a large quantity of tar products. From the earliest days of the war, therefore, these essential materials were supplied to the Allies, especially to France. For instance, the total quantity of benzol supplied during the war to France for the manufacture of synthetic phenol exceeded 100,000 short tons.[1] Considerable quantities were also issued to Russia, Belgium and Italy,[2] and in spite of the serious position in regard to H.E. in the autumn of 1917, there was enough benzol to meet the British demand for picric acid and to allow of larger allocations to the Allies. By August, 1916, it was reported that there was no difficulty in supplying Allied Governments with synthetic phenol, and Russia and Italy both received supplies.[3] Toluol was also sent to Belgium, Italy and Russia,[4] but the reluctance of shippers to carry it was a hindrance to export. A considerable amount of gas retort carbon was also sent away,[5] and in addition to tar products various petroleum products were exported.[6]

High explosives, especially T.N.T., were in great demand by France, Belgium and Russia during the first few months of the war. An attempt to satisfy the need for T.N.T. by the purchase of a large quantity in Italy was not very successful.[7] After 1914, the French demand ceased, but supplies to Belgium, Roumania, and Portugal were made on a small scale, and larger quantities issued to Italy and Russia. Supplies to both the last-mentioned countries were supplemented by orders placed in America,[8] and from the autumn of 1917 to June, 1918, the entire output of the Trenton T.N.T. factory was placed at the disposal of Italy.[9] A certain amount of picric acid was exported, especially during the first quarter of 1915, but export was occasionally difficult, as in January, 1917, when Italy agreed to accept phenol instead, and in 1918, when American help was necessary to meet Italian needs.[10] Sulphur was sent to Russia; ammonal, for which special contracts were arranged in 1915 mainly for the Allies,

---

[1] HIST. REC./H/1010/3. In 1914 the War Office undertook to supply at least 2,300 tons per month throughout the war, and this amount was increased in 1915 to 2,800 tons. In September, 1915, the French were also asked to import more metallurgical coke, of which there was a large surplus, so as to make it possible for the British to produce more benzol. (HIST. REC./R/1011/3, 1800/6 1011/2.)

[2] HIST. REC./H/1010/3, R/1010/30. C.R. 4230, 4457. (Printed) *Weekly Report*, No. 108, XI (8/9/17); 102, XI (28/7/17).

[3] HIST. REC./R/1012/5; HIST. REC./H/1010/3.

[4] HIST. REC./H/1010/3; R/1012/13, 1010/30; C.R. 4457; (Printed) *Weekly Report*, No. 108, XI (8/9/17).

[5] HIST. REC./R/1010/30, 38; Sir L. Llewelyn's Papers, 508.

[6] Naphtha and naphthalene, metacresol, creosote, tar oil, cresol were sent to one or more of the Allies; also such compounds as diphenylamine. (HIST. REC./R/1010/37; D.M.R.S. 503; (Printed) *Weekly Report*, No. 107, XI (1/9/17).

[7] 67,000 lbs. were ordered, to be exchanged for toluol, but the arrangement was cancelled after about a third had been delivered. Other arrangements did not materialise. (Vol. X, Part IV, p. 44.)

[8] HIST. REC./H/1010/3; (Printed) *Weekly Report*, No. 108, XI (8/9/17); D.M.R.S. 410; HIST. REC./R/1013/15.

[9] D.M.R.S. 410.

[10] HIST. REC./H/1010/3; HIST. REC./R/1012/5; C.R. 4457, 4230; M.C. 828: D.M.R.S. 410; (Printed) *Weekly Report*, No. 108, XI (8/9/17).

to Russia and Italy, with a small quantity to Serbia in 1915.[1] Except for small allocations of dynamite glycerine, no issues of glycerine were made to the Allies,[2] but in September, 1915, the British Government offered to exchange refined for crude glycerine, which the French had stopped exporting, and to make up any small deficiency ; *i.e.*, the rate of exchange was to be 1 ton of refined for 6 or 7 tons of crude material.[3]

Large quantities of nitrate of soda were bought for France and Russia,[4] and smaller amounts for Italy[5] and Belgium. Until the end of 1917 the Allies bought independently, but after the formation of the Nitrate Executive, England made purchases for France and Italy. A shortage of stock in 1918, together with difficulty of transport, necessitated the diversion of cargoes intended for Great Britain to France, but by October successful negotiations with the Chilean Government assured supplies. Other nitrates supplied to the Allies included ammonium nitrate to France, Belgium, Italy, and Russia,[6] and potassium nitrate to France and Russia. Sulphuric acid was sent to Belgium, a small amount of ammonium perchlorate to Italy, potassium chlorate to Russia, and phosphorus to Italy.[7] Supplies of sodium cyanide, urgently pressed for by Russia in 1917, were refused owing to home shortage, but in 1917 about 300 tons were sold to the French for the manufacture of V.N.[8] Negotiations in America for acetone and acetate of lime were prejudiced by competition among the Allies, and it was therefore arranged early in 1917 for Great Britain to purchase supplies for herself, France and Italy. A similar arrangement was made for 1918, and supplies for Portugal purchased in the same manner.

Gunpowder was not very much used, and existing capacity sufficed until the Russian demands were put forward. During 1917 the supply to Russia was increased, and during 1918 issues were made to certain of the Allies, especially to the United States. A small guncotton factory in England was enlarged in 1916 to supply the Belgian as well as the British Government, and some 200 tons were sent to Roumania, but no other issues were made. A certain amount of cordite was supplied to Belgium and Italy, and cotton waste to France and Russia. For the latter material France and England agreed in June, 1917, to buy in separate markets and share any surplus.

Large purchases of propellants were made abroad on behalf of the Allies, notably in the United States on behalf of Russia. Nitro-

[1] HIST. REC./H/1010/3.

[2] An attempt to purchase glycerine for Italy in U.S.A. in 1917, was abandoned owing to independent negotiations in the same country by the Italians. HIST. REC./R/1012/5 ; D.M.R.S. 410.

[3] HIST. REC./R/1011/2, 3.

[4] HIST. REC./H/1010/3.

[5] After the Caporetto disaster 40,000 tons intended for the United Kingdom were diverted to Italy (D.M.R.S. 410).

[6] HIST. REC./R/1010/34 ; 1011/42 ; H/1010/3.

[7] HIST. REC./H/1010/3.

[8] C.R. 4432 ; Vol. XI, Part II, Chap. V.

cellulose was bought in great quantities for Russia during 1915,[1] and in the last half of 1916 it was arranged that of 29,000 tons ordered, Great Britain was to have 15,000 tons, Russia 12,500 tons, and the remainder was to be divided between Belgium and Italy. Negotiations, at the end of 1916, for the purchase of the surplus output from Messrs. Dupont were broken off owing to financial difficulties, and a Treasury ruling limited the supply to Russia, and prohibited export to Roumania.

Contracts for gunpowder, phenol, potassium chlorate, toluol, and guncotton were also arranged on behalf of the Russian Government, and in addition antimony sulphide was obtained from China, nitrate of potash in India, nitrate of soda from Chile and Japan, and sulphur from Sicily.[2]

In some cases exchanges were made, as for example in April, 1915, when, with the cessation of the manufacture of Schneiderite, dinitronapthalene was exchanged with the French Government for perchlorate of ammonia. Again, in order to meet the French demand for chlorine, needed for gas attacks, and to obtain phosgene, of which the French retained the manufacturing secret, the English at the beginning of 1915 agreed to exchange chlorine for phosgene in the proportion of two to one. No formal agreement was made at first, but owing to the French failure to supply the promised quantities, an agreement was made in June, 1916, and renewed from time to time throughout the war. By means of this exchange the British were able to obtain earlier and larger supplies than they could otherwise have done, while the British chlorine enabled the French to extend their gas operations. The subsequent efficiency of the Calais factory fully made up for the early delay.[3]

III. Supply of Munitions.

(*a*) GUNS.

The expectation that, owing to the difficulty of manning the large number of guns ordered by Mr. Lloyd George, there would be a considerable surplus available for the Allies, was not realised.[4] It became apparent that even the minimum British requirements would not be met until well into 1917,[5] and that guns withdrawn from the Western Front to make way for newer types would not be available for distribution until the end of 1917.[6] By 1918, when the British supply was in a much better position,[7] many of the urgent calls had ceased, and Great Britain was able to undertake with a reasonable chance of success a very large programme for the United States.

---

[1] HIST .REC./R/1013/15. HIST. REC./H/1010/3.
[2] HIST. REC./H/1010/3.
[3] For further details see Vol. XI, Part II, Chap. IV.
[4] See Vol. X, Part I, Chap. I.
[5] HIST REC./R/1013/13 ; C.R.4502.
[6] HIST. REC./R/1010/22.
[7] Vol. X. Part I. Chap. II.

The supply of guns to Russia was a serious problem. The small demand made early in the war had been met by contracts placed direct by the Russian Government,[1] but to meet the heavy demands made during the last months of 1915 and during 1916,[2] 300 4·5-in. howitzers were allotted for delivery in the spring of 1916 and by the transfer of an option, an order for 100 8-in. howitzers was placed in the United States.[3] In July, 1916, an arrangement was made to allot to Russia, after the minimum requirements of the British Army had been met, one out of every three equipments of various types up to a total of 390.[4] Further allocations of artillery were made, but the full requirement was far from met and by the end of 1916 about 480 guns and howitzers had been shipped.[5]

In spite of the recommendations of the Milner Committee,[6] and the critical position in Russia, no help was possible in respect of field guns, and the 60-pdrs. which it was thought might be available could not be supplied, as manufacture was curtailed owing to the requirements for the arming of merchant ships.[7] The War Office stopped supplies in the middle of 1917, and owing to the Revolution they were not resumed. In December it was arranged that guns originally destined for Russia should be used by Great Britain or the Allies.[8]

The United States Government put forward large demands for their 1918 and 1919 campaigns, but during 1917 practically no assistance was given. Towards the equipment of the United States Army with 11,800 guns by June, 1919, the British offered to supply about 3,000 guns of various calibres,[9] and expected to improve their earlier promises.[10]

In October, 1918, the numbers of guns, and the dates at which they were to be handed over were fixed by a Convention.[11] It was proposed to treat the supply of guns for America as an integral part of the British programme and to maintain output at a higher level than would otherwise have been the case.[12] With the signing of the Armistice the numbers were severely reduced, and compensation for the cancelling of contracts was arranged.[13]

---

[1] HIST. REC./R/1013/15.
[2] C.R. 4457.
[3] HIST. REC./R/1201.3/1, 1010/8 ; 1013/5.
[4] C.R. 4502 ; HIST. REC./R/1010/22. The types were 6-in., 8-in., and 9·2 in. howitzers and 60-pdrs.
[5] 60-pdrs., 8 ; howitzers of various calibres chiefly 4·5-in., 457 ; 40 mm. guns, 16. HIST. REC./R/1010/22. HIST. REC./R/1013/13 ; C.R. 4457.
[6] HIST. REC./R/1013/14.
[7] C.R. 4320.
[8] C.R. 4432. (Printed) *Weekly Report*, No. 106, XI, (25/8/17) ; D.M.R.S. 404.
[9] Field guns, 1500 ; 6-in. howitzer, 710 ; 6-in. gun, 180 ; heavy howitzers, 354 ; plus 96 already received : 60-pdr., 220 ; Owing to the impossibility of supplying certain of the types asked for, e.g. 75 mm. field guns and 155 mm. guns and howitzers, certain other types were substituted, e.g. 18-pdrs., 6-in. guns 60-pdrs. and 6-in. howitzers. (M.C. 829 ; HIST. REC./R/1010/30.)
[10] M.C. 828.
[11] 19 October, 1918. (HIST. REC./R/1141/53, 1014/4.)
[12] HIST. REC./R/1014/6.
[13] HIST. REC./R/1141/53, 1014/6.

Little assistance in guns was given to the other Allies. During 1916 Portugal made several demands and was prepared to take British types, but at that time it was not possible to make any allocations.[1]

Except for certain gun parts the only artillery supplied to Italy was the issue of 160 guns during the winter of 1917–18, to help in making good the losses of the retreat, and in addition some repairs were undertaken.[2] In May, 1918, 40 6-in. howitzers were handed over by the War Office to Greece, but no other issues[3] were made and Japan and Serbia made no demands on British supplies. In spite of various suggestions[4] for the issue of howitzers to Roumania, no artillery was provided by England, as it was considered that with regard to heavy artillery the Eastern Front should be treated as a whole.[5]

(*b*) Gun Ammunition.

During the first two years of the war British supply was in too precarious a condition to allow of the allocation of capacity or completed ammunition to the Allies, except on a small scale to Belgium and Russia.[6] By the beginning of 1917, however, the position at home and in Canada had much improved,[7] and a feature of the programme as revised in May, 1918, was the large demand for heavy ammunition for the Allies.[8] Russian orders were a ceaseless anxiety, and except for certain contracts placed early in the war, in England and Canada,[9] the Russians took no further steps to relieve the acute shortage of ammunition until in June, 1915, they sanctioned the placing of large orders in America by Lord Kitchener's Committee.[10] Deliveries on all contracts were considerably delayed and hampered by the difficulty of manufacturing special Russian types, and attempts to get the Russians to develop their own manufacture were not conspicuously successful.[11] Orders for gas shell placed in England proved most disappointing.[12] In January, 1916, the supply of 4·5-in. howitzer shell had to be cut down, and in May a request for heavy shell was refused. Later[13] (July, 1916), the Russians pressed for large quantities of H.E. and shrapnel to carry on their offensive in the South; shell above 6-in. was specially required, but the Ministry was not very

---

[1] D.M.R.S. 429.
[2] C.R. 4457; D.M.R.S. 410. The numbers were made up as follows: 40 15-pdrs., 80 6-in. howitzers, 40 8-in. howitzers.
[3] D.M.R.S. 545.
[4] C.R. 4457, 4320, 4341; D.M.R.S. 424; C.R.V/R/036.
[5] C.R.V./R/036; C.R. 4320.
[6] Hist. Rec./H/1300/16.
[7] Hist. Rec./H/1300/15.
[8] Requirements were at the rate of 214,000 rounds of 6 in. howitzer, 17,000 of 8 in. howitzer and 1,900 of 9.2 in. howitzer ammunition per week. (Vol. X, Part II, Chap. I).
[9] Hist. Rec./R/1013/15.
[10] *Ibid.*
[11] C.R. 4502, 4457; Hist. Rec./R/1013/6.
[12] C.R. 4432.
[13] Hist. Rec./H/1300/16.

hopeful.[1] The Milner Committee recommended the shipment of an adequate regular weekly ration.[2] Supply had begun on a large scale when the Revolution took place, but by December, 1917, there was no British capacity engaged on Russian contracts.[3]

The Belgian Government had a contract with the Pelabon works for 105 mm. shell, but otherwise, like France, Greece, Portugal and Serbia, received no supplies other than those handed over by the British Expeditionary Force. Italy manufactured most of her own ammunition, but did make certain demands; owing, however, to difficulties in home supply no issues were made until 1917, when a certain amount of empty shell, fuses and complete rounds were shipped,[4] and to repair the losses of the retreat 110,000 additional rounds were despatched in the winter of 1917–1918.[5]

Roumanian requirements were partially met by the transfer of the Pelabon capacity for 105 mm. shell, and in March, 1917, the Roumanians agreed to accept 75 mm. shell of American make.[6] Complete rounds of 5-in. and 6-in. howitzer shell were also supplied from Great Britain.[7]

Supply to the United States had not developed when the Armistice was signed. At the end of 1917 the British Government agreed to furnish ammunition for 8-in. and 9·2-in. howitzers, and by the Convention of October, 1918, undertook a large programme. By using Canadian shell-making capacity Great Britain expected to be able to supply ammunition for all the guns offered for the 1919 programme.[8]

(*c*) SMALL ARMS.

Owing to the delay in delivery on the large contracts placed in the United States, the rifle supply was, until the close of 1917, so inadequate for British needs as to limit the number of men who could be put into the field.[9] Issues to the Allies were, therefore, out of the question, and by 1918, when there was a surplus capacity, the rifle had yielded in importance to the machine gun. Issues of pistols and revolvers were, however, made on various occasions.[10]

A contract placed in Birmingham early in the war by the Belgian Government was never very satisfactory. France made no demands

---

[1] C.R. 4502; HIST. REC./H/1010/3.
[2] C.R. 4320.
[3] HIST. REC./R/1013/3.
[4] HIST. REC./H/1010/3. See also HIST. REC./R/1012/4; D.M.R.S. 410. (Printed) *Weekly Report*, No. 102, XI (28/7/17). *Ibid.*, 107, XI, (1/9/17). HIST. REC./R/1012/5; C.R. 4457.
[5] D.M.R.S. 410.
[6] D.M.R.S. 424.
[7] The Belgians agreed to complete the assembly of shell bodies at Havre. HIST. REC./H/1010/3; D.D.G.(B). 108; (Printed) *Weekly Report*, No. 102, XI (28/7/17). No. 107, XI (1/9/17).
[8] HIST. REC./R/1141/53; HIST. REC./H/1010/3; HIST. REC./R/1010/30.
[9] Vol. XI, Part IV, Chaps. II, III and IV.
[10] HIST. REC./R/1010/37.

on British resources, and her arrangement to arm the Serbians, and later the Roumanians, relieved the United Kingdom of responsibility.[1]

The largest and most pressing demands were made by Russia. Contracts were placed in the United States during 1915 for 2,300,000 rifles of Russian pattern,[2] but output was most disappointing. To meet fresh demands made during the first half of 1916, Great Britain was only able to offer 2,500,000 American-made 1914 pattern rifles, which were expected to be available during 1917 when British output should equal demand, but as delivery could not be begun until August, 1917, the offer was refused. The only small arms, therefore, supplied by England, other than those manufactured in the United States out of British credits, were 60,000 Japanese rifles shipped in 1916.[3]

During 1916, Italy, Portugal and Roumania also pressed for rifles. The requests of the two former were refused, and an arrangement to ship to Roumania 100,000 American-made rifles was cancelled.[4] In January, 1918, 50,000 rifles were despatched to Italy, to help make good the losses of the autumn retreat,[5] and during 1917, 1,000 were supplied to Portugal. On their entry into hostilities, the United States demanded 1,000,000 rifles, and this need was met by the transfer to them of the British-owned plant in the United States.

Throughout the war assistance was given to Allied Governments in the supply of machine guns. In the early months an agreement was made with the French Government that the entire output of Messrs. Vickers' works at Crayford, up to 2,000 guns, should be at their disposal.[6] Similarly, direct contracts were placed by Russia in Birmingham[7] and the United States.[8] At the same time, Italy was offered machine guns if she could supply the skilled labour,[9] but the project fell through.

During 1916 the British machine gun programme included a surplus for the use of Allies, and it was hoped that 13,000 guns of various types would be available by June, 1917.[10] However, during the year 400 guns were shipped to Roumania,[11] and Belgium, France, Italy, Russia and Portugal also received supplies, though the Russian contracts in America proved very disappointing.[12]

---

[1] The only supplies to Serbia were 45,000 rifle barrels shipped in 1916. Hist. Rec./R/1010/37.

[2] Hist. Rec./R/1013/15, p. 12.

[3] Hist. Rec./R/1010/37, 1013/15, 1010/8.

[4] D.M.R.S. 424.

[5] D.M.R.S. 410.

[6] Hist. Rec./R/1011/2, 1010/22. The French also had an order with Messrs. Hotchkiss for 600 guns.

[7] Hist. Rec./R/1013/15, p. 8.

[8] Hist. Rec./R/1010/8. Russia also had an order in the United States for 12,000 Colt guns, and through Messrs. Vickers, for 10,000 Maxim guns (Hist. Rec./R/1013/15 p. 12).

[9] Hist. Rec./R/1010/8.

[10] Hist. Rec./H/1410/4; Hist. Rec./R/1010/22.

[11] D.M.R.S. 424; Hist. Rec./H/1410/4; C.R. 4457.

[12] D.D.G.(B) 121; C.R. 4502; D.D.G.(B) 108.

The enormous increase in aeroplane and tank programmes, and the growing importance of the machine gun as man-power waned, led to heavy demands in 1917, but it was found possible to send all types to the Allies,[1] and at the end of the year 2,000 Lewis guns were sent to Italy to repair losses incurred in the retreat and a further 1,000 promised.[2]

By 1918, except for aviation demands which could be met, French requirements from England had been satisfied ;[3] arrangements were made to fulfil American needs, and in September, 1918, production of guns for the Allies was increased to 700 Vickers and 600 Lewis per month.[4]

(*d*) SMALL ARMS AMMUNITION.[5]

The British Government devoted a considerable capacity to the manufacture of small arms ammunition for the Allies, and in addition financed in America large contracts for Russia.[6] The possibility of a surplus of machine guns and rifles being available for the Allies in 1916, and of a demand for ·303 Mark VII ammunition from Russia, led to the decision to place increased orders for that calibre, and although the winter supply for Russia was sent in advance, stocks became so large that in January, 1917, it was decided to divert the whole of the current income to Russia. Meanwhile large Roumanian requirements were presented, but on the decision that the French should undertake equipment, were considerably reduced, and when, in May, 1917, owing to depletion of stock and increased demand, export was suspended, the Russian Government undertook to supply Roumania from their stock. Eventually the stock held back from export was transferred to Great Britain and 45,000,000 rounds were shipped to Italy. The Italians were also supplied with a considerable number of cartridges without bullets.

Tracer ammunition was also supplied, from 1917 onwards, to the Belgians, Italians and French, but owing to British needs it was not always possible to satisfy demands.[7] During 1918, demands from European Allies other than the French fell away, but large demands were received from the United States and met.[8]

Arrangements were also made for the manufacture in Great Britain of special calibres, as for instance, ·256-in. ammunition for Japanese rifles bought by Russia, and in July, 1916, the British Government undertook to manufacture for Russia 7·62 mm.

---

[1] HIST. REC./R/1012/5 ; D.M.R.S. 503.
[2] D.M.R.S. 410.
[3] M.C. 828.
[4] HIST. REC./H/1410/4.
[5] See Vol. XI, Part VI.
[6] HIST. REC./R/1013/15, pp. 4, 13.
[7] *e.g.*, in September, 1917, a Belgian demand for 20,000 rounds of Buckingham ammunition was refused.
[8] The demand was for 500,000 rounds each of Buckingham and S.P.G. bullets per month.

ammunition on a large scale. In January, 1917, the supply of 6·5 mm. ammunition for Roumania was arranged, but ceased in November. From March, 1917, to the end of the war, 7·65 mm. ammunition was manufactured for the Belgians.

An offer to make American ·30 ammunition was under consideration at the Armistice. Except for a small supply to Japan, no ammunition was sent to other Allies, but the French had private contracts in England for Lebel cartridges.[1]

(*e*) Trench Warfare Stores.

A feature of the development of trench warfare stores supply was the very considerable quantities of obsolete stocks which accumulated. Hence, in spite of the difficulties of supply, it was generally possible to meet urgent requirements from the Allies with some kind of store, as for instance, the supply in 1916 to Russia of several millions of the rejected Ball and Lemon grenades.[2] In the same year also a market for a certain number of percussion grenades of early pattern was found among the Allies. From the end of 1916 onwards, however, British capacity was so well organised that most demands could be met. For instance, in the spring of 1917, it was arranged to allocate a certain proportion of the British output of 3-in. Stokes mortars to the Russian, French, Italian and American Armies.[3] By the end of 1917 a large proportion of the productive capacity in Great Britain for trench warfare munitions was occupied upon the manufacture of mortars and their ammunition for the equipment of Allied Armies, particularly the American Expeditionary Force.[4] During the enemy advance in the spring of 1918, it was even found possible to supplement French supplies by the issue of 1,200 mortars. Trench artillery of other types than the 3-in. Stokes mortar was also supplied, as for instance, the 9·45-in. trench howitzers, 6-in. Newton and 2-in. mortars and ammunition issued to Russia in 1917.[5]

The British output of Mills' grenades was increased to supply the needs of the French during 1916,[6] while a regular supply of grenades to the Belgians was sanctioned from November, 1916,[7] and special issues were made to Serbia and Russia.

---

[1] Owing to difficulties in manufacture these contracts were not very satisfactory.

[2] Hist. Rec./H/1610/16. Sometimes the offer was rejected, as in the case of 3.7-in. mortars, which were unacceptable to the Allies (D.M.R.S. 262).

[3] D.M.R.S. 262,B.3. Italy was anxious to start manufacture on her own account, but until this was possible Great Britain shipped supplies: *e.g.*, in 1917, 3-in. Stokes mortars plus bombs had been sent. (Printed) *Weekly Report*, No. 102, XI (15/9/17); No. 103, XI (22/9/17); Hist. Rec./H/1010/3.

[4] In August, 1918, the Ministry was able to offer 2,646 3-in. Stokes mortars, 1,421 4-in. mortars and 1,020 6-in. Newton mortars for delivery by October, 1919, and this was not necessarily to be regarded as the maximum (M.C. 829). See also (Printed) *Weekly Report*, No. 102, XI (15/12/17); Hist. Rec./R/1010/20.

[5] Hist. Rec./R/1010/37. By the end of 1916 the supply of a larger type mortar than the 9.45-in. had just begun for export to Russia.

[6] D.M.R.S. 262 A.

[7] (Printed) *Weekly Report*, No. 104, XI (11/8/17) and No. 122, IX (15/12/17).

As early as 1915 flame projectors were being made with a view to supplying the needs of the Allies, but Livens projectors were not, generally speaking, manufactured by England for the Allies.[1]

From the middle of July, 1916, Great Britain arranged to make helmets for her Allies after her own needs had been met. A few were supplied to Russia and at the end of 1917 Belgium and Portugal were making trials of samples. The largest issue, however, was that of 1,500,000 to American troops.[2] Respirators were also issued to the Allies, notably to Italy, to whom over 2,500,000 were shipped in 1918.[3] Other miscellaneous stores such as trench covers, strombos horn sets, Very pistols and cartridge signals, thunder flashes and smoke candles were issued to those of the Allies engaged in trench warfare.[4] Most of the stores presented few problems and the supply of the long American list of requirements in 1917 was regarded without apprehension.[5]

(*f*) Optical Munitions and Glassware.

In 1914 the position of English trade in regard to the production of optical munitions and glassware was so bad that it was not until the end of three years that Great Britain was able to export enough to be of material assistance to the Allies.

Up to the autumn of 1916 only about 250 lbs. of glass had been exported, but some improvement then began. Russian demands were partly met by orders placed in the United States[6] but other pressing requirements had to be in the main refused. The supply of field glasses was exhausted early in the war, " the representative of the Russian Government made a tour of all the pawnshops in England . . . . . and got a few thousands."[7] Small supplies of various articles were sent to Italy during 1914-1917 and considerable efforts were made on behalf of Russia. Belgium received miscellaneous stores and in 1917, 1,000 binoculars were sent to Roumania. A very few items were supplied to Portugal.

In 1918, the supply was much more generous; the American Army was furnished with binoculars, telescopes and periscopes, a small quantity of glass was sent to Greece, and other Allies, especially Italy, were granted supplies. By the second quarter of 1918 the export to the Allies had reached over 17,000 lbs.[8]

The supply of range-finders was always difficult. Early in the war it was arranged that France should receive a proportion of the weekly

---

[1] D.M.R.S. 410. Italy had requisitioned 2,000 in 1918 and of the American demand for 19,000, only 2,000 were promised.

[2] Hist. Rec./R/1141/53.

[3] Hist. Rec./H/1010/3.

[4] Hist. Rec./R/1010/37, 1141/53.

[5] (Printed) *Weekly Report*, Nos. 113, 114, XI (13 and 20/10/17).

[6] C.R. 4320, 4457. In January, 1917, the Russian demand was for 124,000 binoculars and in 1916 23,000 were wanted.

[7] Hist. Rec./R/1010/8.

[8] Vol. XI, Part III, p. 136.

output and orders were placed in America (September, 1915) on behalf of Russia,[1] but generally speaking home needs were so great that Allies received but a very small proportion of their demands.[2]

(*g*) Aviation Material.

Until the end of 1917 British aircraft production was not in a position to meet any but the most pressing requirements, and throughout the war engine output was a limiting factor in supply. Except, therefore, for some stores issued to Russia in 1916, few supplies appear to have been made to Allies before 1917.[3]

The Milner Committee promised to furnish Russia during 1917 with as many aeroplanes, complete with engines and wireless, as possible up to 800.[4] There was, however, much confusion in connection with the Russian demands and in some respects, *e.g.*, in the demand for more engines than bodies, the requirements were contrary to British experience.[5] In June, the Air Board proposed to deliver by mid-November 200 aeroplanes of various types, complete with engines, spares, etc., if the Russians would allow the first deliveries of certain engines ordered independently to be diverted to Great Britain.[6] The Russians were also manufacturing their own aeroplanes and Great Britain supplied machinery, and material, such as timber, as well as radiators, bomb sights, magnetos, propellers, photographic apparatus, etc.[7] During 1917, Roumania was supplied with 19 armed aeroplanes, and by the date of the Armistice aviation supplies for Greece, Japan and Belgium included aeroplanes with and without engines, timber, instruments and fabric.

With the exception, however, of some hangars, propellers, dope, balloons and aeroplane cloth no supplies were sent to Italy.[8]

During 1918 some machines were supplied to the French. Considerable supplies were made to the United States of aeroplanes, engines, hangars, linen and fabric, dope, instruments and equipment.[9] The British Government also arranged to assemble at Oldham certain Handley-Page aeroplanes built in the United States on behalf of the American Government. The cost was to have been borne by the United States, but the British Government finally paid the costs of construction and production and supplied various missing parts. Little, however, was done by November, 1918.[10] Owing to the late development of

---

[1] (Printed) *Weekly Report*, No. 8, V (18/9/15).
[2] C.R. 4320, 4457; (Printed) *Weekly Report*, No. 101, XI (21/7/17); Hist. Rec./R/1013/3; D.M.R.S. 410; Hist. Rec./R/1011/2; D.D.G.(B).12.
[3] Vol. XII, Part I and Hist. Rec./H/1010/3.
[4] Hist. Rec./R/1013/14; C.R. 4320, 4432.
[5] C.R. 4432.
[6] *Ibid.*
[7] Hist. Rec./R/1010/37.
[8] Hist. Rec./H/1010/3; Hist. Rec./R/1010/37
[9] Hist. Rec./R/1141/53. No returns are available for supplies, if any, during 1917. During 1918 a certain number of machines were also allotted to the British Aviation Mission or to Aviation Officers in U.S.A.
[10] Vol. XII, Part I.

the use of aeroplanes for bombing, the supply of aerial bombs was not fully organised till comparatively late in the war. In fixing the programme, possible demands from the United States were taken into consideration, but their earlier programme did not mature and very little was supplied before the Armistice.[1]

(*h*) MECHANICAL TRANSPORT.[2]

Generally speaking, in spite of a marked dependence upon American resources for lorries and Ford productions, Great Britain was able, owing to the flourishing condition of her motor industry, to supply mechanical transport in considerable quantities to the Allies throughout the war. Prior to September, 1916, the War Office had arranged supplies for Russia of various motor driven vehicles, and of large numbers of lorries and bicycles for France and Belgium, and the Russian Government had also placed several direct contracts.[3] In May, 1916, a very large demand had been received from Russia for cars and motor cycles. The supply of motor cycles presented few difficulties, but owing to late delivery the balance of the order was cancelled by the Russians in June, 1917.

The Russians were persuaded with some difficulty to reduce the number of types of vehicles demanded.[4] Owing to transport difficulties it was agreed that the British Government should provide chassis only, but it was not found possible to supply the number promised.[5] Similarly only half the lorries which had been promised were shipped.[6] British works were enlarged to provide for the manufacture of motor and armoured cars, but owing to manufacturing delays, increasing British demands, and the Russian Revolution nothing like the number demanded was supplied. Requirements from France and Belgium consisted chiefly in motor and pedal bicycles, but a few lorries and motor cars were supplied.[7] Few vehicles were sent to Italy. Her demand for armoured cars in 1917 was not met,[8] though bicycles, motor cycles, ambulances, Holt tractors and caterpillars were supplied on a small scale in 1916 and 1917.

Only a small part of the large Portuguese demands was met, but Roumania received a certain number of motor ambulances, cycles and pedal bicycles,[9] and ten armoured cars for machine guns were sanctioned by the Treasury.[10] American demands were large and various, and

---

[1] HIST. REC./R/1141/53. A demand for 350,000 20-lb. bombs was received in July, 1918, and about 100,000 were delivered in 1918.
[2] See Vol. XII, Part IV.
[3] HIST. REC./R/1013/15.
[4] C.R. 4457, 4502.
[5] HIST. REC./H/1010/3.
[6] *Ibid.*
[7] HIST. REC./H/1010/3.
[8] D.M.R.S. 410; M.C. 829; HIST. REC./H/1010/3.
[9] D.M.R.S. 410, 429; HIST. REC./H/1010/3.
[10] (Printed) *Weekly Report*, No. 106, XI (25/8/17).

during 1918 supplies to America included lorries, G.S. wagons and water tanks, in addition to motor cars, ambulances, motor and pedal bicycles, vans, side-cars, and tractors.[1]

(*i*) TANKS.[2]

The appearance of tanks in action towards the end of 1916 brought demands in the beginning of 1917 from Russia, France and Belgium. The difficulties and delays, however, incidental to the production of tanks on a large scale made it impossible to supply the Allies until 1918. Eventually, Great Britain became the chief manufacturer of the heavy type, and in November, 1917, the United States and British Governments combined to manufacture, at a factory at Chateauroux, at least 1,500 tanks of the " Liberty " type. The first 600 were to be supplied to the American forces, the British supplying armour, armament, ammunition and unskilled labour.[3] The scheme, however, was slow to develop and had not materialised when hostilities ceased.

In April, 1918, the British Government offered the French a number of Mark V tanks in exchange for Renault light tanks, but after the retreat in the spring of 1918 it was arranged to send to France the surplus Mark IV tanks and to dispatch Mark V* to the British and then to the French and American Armies. In August, however, the decision to hand over the Mark IV tanks was cancelled. Some tanks, as for instance, one to Japan and six to the United States, were also shipped for experimental or exhibition and training purposes.[4]

(*j*) RAILWAY MATERIALS.

Until the autumn of 1915 there was little demand from the Allies for railway material. At the end of 1915 the Ministry placed a contract for France for locomotives and wagons,[5] but it was largely owing to the enormous demands received from Russia in 1916 that the Railway Materials Department was created. After September, 1916, Allied demands sank into the background in face of the pressing British need, and during 1917 and 1918 received only such attention as was possible in the struggle for capacity and, later, for material. During 1916 the French orders were considerable, and by the end of the year, when British pressure began, the largest firm of locomotive builders had orders for 380 engines for France.[6] Deliveries were delayed, complaints were received, and finally it was decided that engines made for France must also be suitable for English use and that any further engines made should come out of the French steel allocation.[7] Small allocations were

---

[1] HIST. REC./H/1010/3.

[2] See Vol. XII, Part III.

[3] Vol. XII, Part III, p. 57. The American Government undertook to replace with ship plates, the steel provided by the British Government for armour plate.

[4] HIST. REC./H/1010/3; HIST. REC./R/1141/53.

[5] At first the French seem to have made their own arrangements with British firms, as in the case of a 1915 order with the North British Locomotive Company (Vol. XII, Part V, Chap. III). The demand of December, 1915, was for 70 engines and 375 wagons and the Minister interested himself personally in its satisfaction. (*Ibid*).

[6] *Ibid.*

[7] HIST. REC./R/1010/37.

made to Italy and Belgium (increasing in 1917 and 1918), and a few stores were sent to Japan, Greece, Portugal and Serbia.[1]

The Russians, whose internal transport was a serious problem,[2] were anxious to have a free hand in purchasing material, but were induced to place all orders through the British Government and agents. By June, 1916, the total value of the Russian demands was £39,000,000, but in the final form the demand was much reduced.[3] Orders were placed in the United States, Canada and Great Britain, and by August, 1916, when the home problems were acute, it was decided that, as no material was available from the British Isles, all orders should be placed in America. Owing, however, to rumours of independent purchasing on the part of Russia, uncertainty as to the state of supply and lack of knowledge as to the use of material in Russian hands, the British Government decided not to place any additional orders.[4] No further supplies were therefore made.

(*k*) MACHINE TOOLS, ETC.

The demands of the Allies for machine tools, small tools, electrical machinery, and engineering supplies for practically every purpose were heavy, as their industry was less developed than ours, but since the British output was insufficient to meet home requirements it was only possible to supply a proportion of their needs. No general policy was laid down, and in practice the Machine Tool Department was left to gauge the position for itself and to reconcile conflicting demands.[5]

In the early days of the war France had placed a large number of orders privately in England, and during 1914 and 1915 considerable supplies were made to Italy. Portugal, Japan, Belgium and Serbia received a certain amount of engineering supplies, and orders for Russia during the same time amounted to over £1,000,000 in value.[6]

Towards the end of 1915 the difficulties of supply were such that American help had to be called in and temporarily all supplies of machine tools to the Allies were stopped ;[7] but though there was reason to believe that new machine tools were being used for non-war work in Allied countries, it was considered best to supply the Allies, especially Italy and France, with British machinery to enable them, so far as possible, to manufacture their own munitions. The Allies were, however, encouraged to buy where possible in the United States.[8]

---

[1] HIST. REC./1010/37.

[2] At the Petrograd conference of January and February, 1917, the requirements for railway material were said to be unlimited (C.R. 4320).

[3] The chief limiting factor was shipping tonnage and the inability of the Russians to move material from the ports expeditiously.

[4] Vol. XII, Part V, Chap. III; HIST. REC./R/1013/14 ; C.R. 4432. In April, 1917, Lord Milner's Committee reported that 375 locomotives, 8,500 wagons and 400,000 tons of rails were on order.

[5] Vol. VIII, Part III, p. 57 ; HIST. REC./R/1700/23.

[6] HIST. REC./R/1010/37.

[7] HIST. REC./R/1011/3, 1010/10 ; Vol. VIII, Part III, p. 57.

[8] HIST. REC./R/1010/8 ; 1012/6 ; D.M.R.S. 429.

Until the end of 1916 most of the machine tools, etc., exported went to Russia, which made no machinery itself.[1]

Early in 1917 the problem of supplying Russia became serious, and it was recommended that only very small quantities of machinery not obtainable in Russia or America to balance up plant should be exported, but during the year the needs declined and the demands of France and Italy became the chief pre-occupation.[2] In 1916 the sanctions for War Office and Admiralty requirements combined were smaller than those for the Allies, and by October, 1916, Allied sanctions had risen to a total almost equalling those for Ministry contracts. During 1918 the Allies were encouraged to rely to an increasing degree on America, and exports were curtailed after March to the time of the Armistice.[3]

Great Britain also gave the United States a certain amount of help in erecting generating stations at the American bases in France, sending engineers and providing much of the plant.[4]

---

[1] The value of exports in 1916 was £900,000. (Hist. Rec./R/1010/37; C.R. 4457.)

[2] The value of exports to France in 1917 was over £3,000,000, to Italy, £990,000. (Hist. Rec./R/1010/37.)

[3] Hist. Rec./R/1700/23.

[4] Vol. VIII, Part III, p. 104.

APPENDICES.

APPENDIX I.

(CHAPTER I, p. 19).

Report of Conference between French and British Representatives held at Boulogne, 19th and 20th June, 1915.[1]

Three conferences took place at the Hotel Dervaux, viz., on the evening of 19 June, at 9 p.m., and in the morning and afternoon of 20th June, all presided over by Mr. Lloyd George.

At the first conference there were present Sir H. Llewellyn Smith, Major-General Philipps, Mr. West, Captain Guest, Colonel Le Roy Lewis. General Du Cane laid before the meeting the table of requirements in ammunition as submitted to the War Office on 12 June, 1915, in O.A.2/118D.

Short discussions arose under each of the headings, and explanations were given regarding the characteristics of the various weapons of the different natures.

The meeting closed after the Minister of Munitions handed to General Du Cane a written question, the purport of which is given below. The answers to the question are shown in tabulated form as attached.

Question : Given an army of 1,000,000 men, what would your requirements be in guns and ammunition in order to deliver a decisive and sustained attack to enable you to break through the German lines ?

At the second and third meetings there were present, in addition to the above, the French Under-Secretary of State for Munitions, General Gossop, of the French War Office ; Colonel Walch, of the Headquarters Staff ; a Colonel of Artillery, and a representative of Creusot's works and an interpreter.

The business of the meeting was mainly occupied in obtaining information from the French officers in the form of answers to questions put by Mr. Lloyd George. Much of the information sought was concerned with manufacturing details or properties of various explosives, types of shell, natures of guns, etc. These questions elicited no information that was not already in possession of our own authorities.

In answer to the question as to number of heavy guns or howitzers thought to be necessary per Army Corps engaged in trench warfare, the French officers agreed that it was desirable to be provided with a number equal to that of the field guns.

A field howitzer was not thought to be of material assistance owing to the lack of power in its shell.

No nature of gun between 3-inch and 6-inch was thought to be worth introduction into a New Army.

They thought that the whole of these heavy pieces required should be of 6-inch calibre and upwards, both guns and howitzers.

It was admitted that the French Army has not yet attained to this ideal in provision of ammunition for this heavy ordnance, but it was stated that it had nearly attained the ideal as regards the actual guns.

The ammunition required for these heavy guns should be all H.E., provided with a proportion of delay action and direct action fuses.

With regard to the number of rounds needed by a force before serious offensive operations could be undertaken, the French officials gave it as their opinion that 1,000 rounds per heavy gun should be accumulated in the sector for attack.

---

[1] HIST. REC./H/1000/3.

For the field guns in the same sector there should be 2,000 rounds per gun, one quarter of this to be shrapnel. They added that on the front, not at this time engaged, i.e., the remainder of the front, 200 rounds per heavy gun should suffice and 500 rounds for field guns. Mr. Lloyd George put it to the French officers that a certain German superiority was to be found in their heavy guns, use of high explosive shell, and machine guns, and this on the whole was agreed to.

A question was then asked whether the German heavy howitzers were remarkably accurate, and, if so, to what that was attributed.

The French, however, emphatically denied any special accuracy in German equipment, and appeared to be of the opinion that any special accuracy with heavy ordnance was not of the very first importance.

It was stated in reply to a question that cases had come to notice where German machine guns were in emplacements protected with overhead cover consisting of iron rails and concrete. It was explained that during a bombardment the machine guns would be lowered under cover, while as soon as the fire ceased they were raised to their firing positions and used against the attack.

At Carency 60 German machine guns were counted in one defended post.

At the third meeting Mr. Lloyd George's questions mainly concerned output of ammunition and manufacturing questions in relation to labour, machinery, material and international organization of resources.

Regarding H.E. composition, the meeting was informed that a different (and more unstable) grade was in use for bombs than was used in shell, which tended to economy. In answer to a question the French officers advised that H.E. shell should be used almost exclusively with any nature of gun in the case of New Armies.

The loss to the French of their manufacturing towns and resources near the frontier had proved very serious and had given the enemy a great advantage in this respect.

It was stated that reliable information was in their possession that the Germans and Austrians combined were actually turning out 250,000 rounds of gun ammunition per day.

The French were stated to be turning out rather under 100,000 rounds of ammunition per day at present, and to have made arrangements that would increase this to 150,000 in two or three months.

The questions raised by M. Thomas, French Under-Secretary of State for Munitions, were as follows :—He asked for the co-operation of British industries in supplying steel to the French for munitions. He volunteered to organise the whole of the Swiss clock-making industry for the production of fuses and to allot a proportion of the output to us. He has taken steps to take up the whole of the industry so as to prevent the Germans obtaining any sort of footing in the country for this purpose. He asked for the co-operation of all the Allied Countries, through their Ministers of Munitions, in dealing with the question of orders given in neutral countries so as to prevent clashing, otherwise he said the manufacturers of neutral countries would accept all orders and sell their output to the highest bidder. He asked for the establishment of a weekly or fortnightly conference in London between his representatives, who were engaged in England in the supervision of work for the French Government, and officials of the new Ministry of Munitions in order to facilitate the more expeditious conduct of his business in England. An arrangement was arrived at by which joint representatives of the British and French Ministers of Munitions would start at once for America to endeavour to extend the production of munitions in the interests of both countries.

Requirements for 1,000,000 Men or 54 Divisions.

Nature.		No. asked for per Division in letter 25 June.	No. of Guns or Howitzers.	*Per Division.
Horse artillery and A. A.	13-pdr.	—	200	32
Field guns	18-pdr. or 15-pdr.	48	2,600	48
Field howitzers	4·5-in. or 5-in. howitzers.	16	850	16
Heavy guns	60-pdr. or 4·7-in.	8	220	*4*
Medium howitzer	6-in. howitzer	8	220	*4*
Heavy howitzers	8-in. or 9·2-in. howitzers	5·3	100	1·8
Very heavy howitzers	12-in. or 15-in. howitzers.	1	A few.	

* The figures in italics have been added at the War Office.

Ammunition: Amounts Calculated according to War Establishment.

Nature.	——	Total number of rounds.
Royal Horse Artillery	At 1,000 rounds per gun.	200,000
Field 18-pdr. or 15-pdr.	,, 1,000 ,, ,, ,,	2,600,000
Field howitzers 4·5-in. and 5-in.	,, 800 ,, ,, ,,	680,000
Heavy guns, 60-pdr. or 4·7-in.	,, 500 ,, ,, ,,	110,000
6-in. howitzers	,, 500 ,, ,, ,,	110,000
8-in. or 9·2-in. howitzers	,, 400 ,, ,, ,,	40,000
12-in. or 15-in. howitzers	—	—

These amounts should be accumulated before the attack, and the daily supply, in accordance with the attached table, kept up.

Table of Requirements.

Nature.	Guns in the country on 7 June.	Rounds per gun per day.	Proportion of H.E.
			Per cent.
18-pdr. Q.F.	781	25	50
15-pdr. B.L.C.	204	25	75
13-pdr. Q.F.	114	25	50
4·5-in. howitzer	164	20	80
5-in. howitzer	48	15	100
4·7-in. gun	88	15	50
60-pdr.	36	20	50
6-in. howitzer	40	15	100
9·2-in. howitzer	14	12	100
8-in. howitzer	4	15	100
15-in. howitzer	3	5	100

APPENDIX II.

(CHAPTER II, p. 42)

Plan of Proposed Sub-Committees of the Inter-Allied Munitions Council[1]

INFORMATION COMMITTEE (EXISTING AS INTER-ALLIED STATISTICAL BUREAU), PERMANENT MEMBERS OF WHICH WILL ACT AS SECRETARIAT OF COUNCIL.

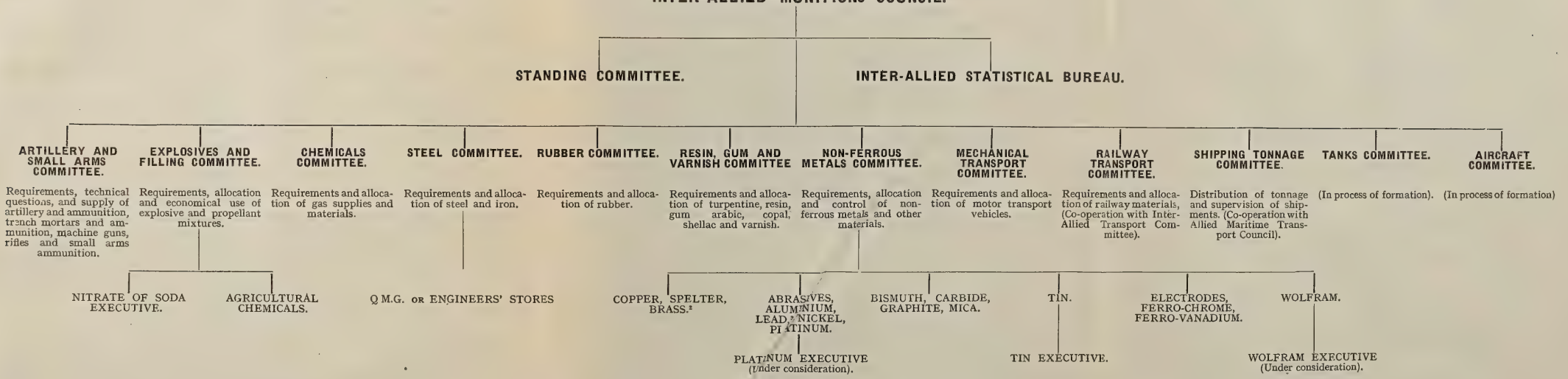
Artillery and Small Arms Technical Committee (to be formed).	Aircraft Committee (already existing in Paris as Inter-Allied Aviation Committee).	Chemical Committee (already existing in Paris as Inter-Allied Commission for Chemical Warfare Supply).	Explosives and Filling Committee (to be formed). / Nitrate Executive (already existing in London).	Tanks Committee.	Non-Ferrous Metals Committee (meets from time to time).		Steel Committee (to be formed).	En Liaison. Inter-Allied Transport Committee (for supplies of raw materials).
					Tin Executive (to be formed).	Tungsten Committee (under discussion). Copper, etc. Committees (to be formed).		

[1] This scheme was annexed to the memorandum on the organisation of the Munitions Council, which was accepted at the first meeting of the Council on 4 June, 1918. (HIST. REC./R/1010/13.)

APPENDIX III.

(CHAPTER II., p. 47).

Organisation of the Inter-Allied Munitions Council, at the end of 1918[1].



Independent Inter-Allied Committees or Commissions in Liaison with the Inter-Allied Munitions Council.

ALLIED MARITIME TRANSPORT COUNCIL.
Allocation of tonnage, and co-ordination of transport arrangements.

INTER-ALLIED FOOD COUNCIL.
Distribution and purchase of food stuffs.

INTER-ALLIED COUNCIL ON WAR PURCHASES AND FINANCE.
Purchase of munitions and materials for Allies in U.S.A. and neutral countries.

INTER-ALLIED TRANSPORT COMMITTEE.
Continental Transport.

INTER-ALLIED TANK COMMITTEE.
Tank policy and allocation of supplies. (Adjourned *sine die* in August, 1918).

INTER-ALLIED AVIATION COMMISSION.

[1] This diagram represents as far as possible the fullest development reached by the Council, but the process of organisation was not complete when its activities were checked by the cessation of hostilities.
[2] Purchases of copper for the Allies were made by the Copper Control Committee of the Ministry of Munitions.
[3] Purchases of lead for the Allies in Spain were made by an Inter-Allied Lead Committee, sitting in Paris.

APPENDIX IV.

(CHAPTERS I AND II.)

Chronological List of Allied Conferences on Munitions, 1914-1918.

Date.	Place.	Subject.
10 Aug. 1914 ..	London	French and British on requirements of French Government.
13 & 14 Aug. 1914	London	French and British on purchase of supplies by French Government.
15 Aug. 1914 ..	London	French and British on French requirements of steel and uniform cloth.
25 Aug. 1914 ..	London	French and British on co-operation in purchasing war material and establishment of Anglo-French Commission.
3 Sept. 1914 ..	London	French and British on requirements of the Allies.
5 Feb. 1915 ..	Paris	British, French and Russians to unite financial resources.
19 & 20 June 1915	Boulogne	British and French on requirements and output of guns and ammunition, manufacturing questions, etc.
7 July 1915 ..	Calais	Mr. Lloyd George and M. Thomas on problems of supply.
4, 5 & 6 Oct. 1915	France	British and French on supplies to France.
15 Oct. 1915 ..	London	British and French on modification of French specification for shell steel.
22 Nov. 1915 to 1 Dec. 1915	London	British, French, Russians and Italians on Russian and Italian requirements, and M. Thomas's suggestion as to Central Munitions Office for Allied States.
29 Jan. 1916 ..	Paris	British and French Ministers and G.H.Q. on co-ordination of efforts.
12 Mar. 1916 ..	Chantilly	Headquarters staffs of Allies.
24 & 25 Mar. 1916	London	British and French on co-ordination of purchase and supply of metals.
27 & 28 Mar. 1916	Paris	British, French, Italians, Belgians, Japanese, Portuguese and Serbians on general conditions of the war and more advantageous use of Allied forces.
6 & 7 Apr. 1916	France	British, French and Russians on delivery of metals to Russia.
13–15 July 1916	London	British, French, Italians and Russians on supplies to Allies.
Summer, 1916 ..	London	British, French, Russian and Italian Finance Ministers on central purchase of war materials.
28 Aug. 1916 ..	London	British and Russians on motor vehicles for Russia.
30 Aug. 1916 ..	London	British and French on establishment of Inter-Allied Munitions Bureau.
1 Sept. 1916 ..	London	British and Russians on mechanical transport for Russia.
5 & 6 Sept. 1916	Paris	British and French on artillery questions.
24 & 27 Sept. 1916	Paris	British and French on supplies of raw materials and organisation of Inter-Allied Munitions Bureau.
19 Oct. 1916 ..	New York	British, French and Italians on supplies of steel.
21 Oct. 1916 ..	London	British and French on supply of shell steel.

Date.	Place.	Subject.
23 Oct. 1916 ..	London	British and French on Allied steel purchases in U.S.A.
26 Oct. 1916 ..	London	British, Russians and Italians on copper requirements.
8–10 Nov. 1916	London	British, French, Belgians, Russians, Italians, and Roumanians on output of munitions and steel purchases in U.S.A.
28 Dec. 1916 ..	London	British and French on guns for merchant ships, purchases in America and steel for Italy.
7 Jan. 1917 ..	Rome	British, French and Italians on Russian missions, Italian purchases in America and Italian labour for England.
18–20 Jan. 1917	Paris	British and French on non-ferrous metals and wolfram ore.
25 & 26 Jan. 1917	London	British and Italians on supplies to Italy.
Jan. & Feb. 1917	Petrograd	British, French, Russians and Italians on supplies in general.
6 Mar. 1917 ..	London	British and French on non-ferrous metals and tinplates.
14 Mar. 1917 ..	London	British and French on tonnage between America and France.
5 June 1917 ..	London	British and French on supply of metals.
5 & 6 June 1917	London	British, French and Italians on tin and emery supplies.
21–22 June 1917	London	British, French, Italians and Russians on use of substitutes for tinplates, purchases of copper in U.S.A., and Russian requirements.
4 July 1917 ..	London	British and French on steel allocation.
1–3 Aug. 1917	Paris	British, French, Russians and Italians on metal supplies.
17 Sept. 1917 ..	Paris	British and French on steel, nitrates, etc.
17–19 Sept. 1917	Paris	British, French, Belgians, Italians, Russians, Americans on gas warfare.
8 & 9 Nov. 1917	London	British, French, Italians and Russians.
20 & 24 Nov. 1917	Paris	British, French, Italians and Russians on lead and chrome ore.
30 Nov. to 3 Dec. 1917.	Paris	British, American, French and Italians on artillery, etc., and Inter-Allied organisations.
29 Jan. 1918 ..	London	British and French on supplies to France.
20 Feb. 1918 ..	Paris	British, French, Italians and Americans on non-ferrous metals.
15 May 1918 ..	Paris	British, French, Italians and Americans on wolfram ore and tin supplies.
9 July 1918 ..	London	British and French on wolfram ore and non-ferrous metals.
2 Aug. 1918 ..	London	British and Italians on steel, iron and explosives.
9 Aug. 1918 ..	London	British and Italians on pig iron and coal.

APPENDIX V.

(CHAPTER III).

Supplies to the Allies, 1914-1918.[1]

Store.	Belgium.	France.	Italy.	Roumania.	Russia.	U.S.A.	Other Allies[2]	Total.
Guns—								
Light—								
1916	—	—	—	—	16*	—	—	16
1917	—	—	70	—	4	—	—	74
1918	—	—	80	—	—	—	—	80
Total Light	—	—	150	—	20	—	—	170
Medium—								
1916	—	—	—	—	465*	—	—	465
1917	—	—	—	—	44	—	—	44
1918	—	—	—	—	—	—	13	13
Total Medium ..	—	—	—	—	509	—	13	522
Heavy and Very Heavy—								
1916	6*	[3]	—	—	111*	—	—	117
1917	14		40	—	136	8	32	230
1918	33		84	—	—	156	12	285
Total Heavy ..	53	17[3]	124	—	247	164	44	649
Total Guns	53	17	274[4]	—	776	164	57	1,341

Gun Ammunition (complete rounds)—								
Light—								
1916	—	—	—	—	52,000	—	—	52,000
1917	—	—	167,528	—	66,164	—	—	233,692
1918	—	11,008	70,000	—	—	—	—	81,008
Total Light	—	11,008	237,528	—	118,164	—	—	366,700
Medium—								
1916	—	—	—	—	818,916*	—	—	818,916
1917	—	—	—	30,000	1,422,464	—	—	1,452,464
1918	—	—	—	—	—	—	42,863	42,863
Total Medium ..	—	—	—	30,000	2,241,380	—	42,863	2,314,243
Heavy and Very Heavy—								
1916	110	—	—	—	94,434*	—	—	94,544
1917	6,000	47,040	64,800	4,000	265,475	2,400	—	389,715
1918	66,520	72,284	766,235	—	—	425,713	72,900	1,403,652
Total Heavy ..	72,630	119,324	831,035	4,000	359,909	428,113	72,900	1,887,911
Total (complete rounds)	72,630	130,332	1,068,563	34,000	2,719,453	428,113	115,763	4,568,854

* Figures marked thus include some supplies made in previous years for which no details are available.

[1] The figures given are the best available, but they are frequently incomplete, particularly as regards raw materials. In a few cases only is it possible to give detailed figures before 1916, but the figures for that year, as is indicated in the table, sometimes include supplies made previously. In other cases, though it is known that supplies were made during 1914 and 1915, no data are available.

[2] Includes China, Greece, the King of the Hedjaz, Japan, Portugal and Serbia.

[3] Total 1914 to 1918 only available.

[4] 893 gun forgings were also supplied to Italy in 1918.

APPENDIX V—*continued.*

Store.	Belgium.	France.	Italy.	Roumania.	Russia.	U.S.A.	Other Allies[1]	Total.
Gun Ammunition (empty shell)—								
Light—								
1916	—	—	—	—	3,354,826*	—	—	3,354,826
1917	—	—	—	38,196	7,213,182	—	—	7,251,378
1918	—	—	—	—	—	—	—	—
Total Light	—	—	—	38,196	10,568,008[3]	—	—	10,606,204
Medium—								
1916	—	—	—	—	20	—	—	20
1917	—	—	—	28,550	—	—	—	28,550
1918	—	—	—	—	—	—	—	—
Total Medium ..	—	—	—	28,550	20	—	—	28,570
Heavy and Very Heavy—								
1916	—	—	—	—	200*	—	—	200
1917	—	—	155,390	—	5,579	—	—	160,969
1918	—	—	—	—	—	—	—	—
Total Heavy ..	—	—	155,390	—	5,779[4]	—	—	161,169
Total Empty Shell ..	—	—	155,390	66,746	10,573,807	—	—	10,795,943

Gun Ammunition Components[2]	—							
1916	—	—	—	—	7,992,955*	—	—	7,992,955
1917	—	—	158,500	10,000	16,856,350	—	—	17,024,850
1918	—	—	18,000	—	—	—	—	18,000
Total Components ..	—	—	176,500	10,000	24,849,305[5]	—	—	25,035,805
Small Arms—								
Machine Guns—								
1916	—	921*	326	400	6,885*	—	—	8,532
1917	72	6,969	2,932	—	20,052	50	—	30,075
1918	224	6,330	5,100	—	—	1,078	102*	12,834
Total Machine Guns	296	14,220[7]	8,358	400	26,937[6]	1,128	102	51,441
Rifles—								
1915	150,000	—	—	—	—	—	—	150,000
1916	6,158	—	—	—	274,247*	—	50,000*	330,405
1917	22,145	—	50,000	—	752,200	24	55,000	879,369
1918	10,551	105	—	—	—	15,081	—	25,737
Total Rifles	188,854	105	50,000	—	1,026,447[8]	15,105	105,000	1,385,511

* Figures marked thus include some supplies made in previous years for which no details are available.
[1] Includes China, Greece, the King of the Hedjaz, Japan, Portugal and Serbia.
[2] Fuses, cartridge cases, primers and friction tubes.
[3] Includes nearly 9,000,000 purchased in U.S.A. on British credits.
[4] Includes 900 purchased in U.S.A. on British credits.
[5] Includes 12,000,000 fuses purchased in U.S.A. on British credits.
[6] 24,500 from U.S.A.
[7] 2,800,500 machine gun components were also supplied in 1918.
[8] 970,000 from U.S.A.

APPENDIX V—*continued.*

Store.	Belgium.	France.	Italy.	Roumania.	Russia.	U.S.A.	Other Allies[1]	Total.
Miscellaneous Small Arms[2]								
1915	20,500	—	—	—	—	—	—	20,500
1916	15,304	—	—	—	—	—	—	15,304
1917	27,283	—	50,000	—	—	—	—	77,283
1918	51,074	—	—	—	—	6	—	51,080
Total Miscellaneous	114,161	—	50,000	—	—	6	—	164,167
Total Small Arms ..	303,311	14,325	108,358	400	1,053,384	16,239	105,102	1,601,119
Small Arms Ammunition—								
·303 in.—								
1916	—	—	—	—	493,392,644*	—	6,760,160*	500,152,804
1917	291,000	270,100	48,734,000	—	283,402,120	824,000	500,000	334,021,220
1918	958,397	1,192,596	51,914,560	—	—	8,173,296	5,856,850	68,095,699
Total ·303 in. ..	1,249,397	1,462,696	100,648,560	—	776,794,764	8,997,296	13,117,010	902,269,723
Other Calibres—								
1916	—	22,000,000*	—	—	374,724,600*	—	—	396,724,600
1917	11,142,000	117,000,000	—	17,797,760	1,315,944,240	—	—	1,461,884,000
1918	38,262,216	—	—	—	—	2,448,700	—	40,710,916
Total other Calibres	49,404,216	139,000,000	—	17,797,760	1,690,668,840	2,448,700	—	1,899,319,516
Total S.A.A.	50,653,613	140,462,690[3]	100,648,560[4]	17,797,760	2,467,463,604[5]	11,445,996	13,117,010	2,801,589,239

Trench Warfare Stores—								
Trench Mortars—								
1916	—	—	—		21*	—	—	21
1917	—	555	213	—	111	338	—	1,217
1918	—	875	—	—	132	1,455	7	2,469
Total Trench Mortars	—	1,430	213	—	264	1,793	7	3,707
Trench Mortar Ammunition—								
1917	—	280,502	67,000	—	147,258	84,602	—	579,362
1918	—	717,362	339,005	—	—	1,171,176	20,759	2,248,302
Total Ammunition ..	—	997,864	406,005	—	147,258[6]	1,255,778	20,759	2,827,664
Grenades—								
1915	360,000	—	—	—	—	—	—	360,000
1916	80,146	1,000,000*	—	—	8,431,056*	—	300,000*	9,811,202
1917	451,000	3,810,876	—	—	—	—	—	4,261,876
1918	260,119	—	—	—	—	306,624	2,000*	568,743
Total Grenades ..	1,151,265	4,810,876	—	—	8,431,056	306,624	302,000	15,001,821

* Figures marked thus include some supplies made in previous years for which no details are available.
[1] Includes China, Greece, the King of the Hedjaz, Japan, Portugal and Serbia.
[2] Includes pistols, revolvers, bayonets and scabbards, trench daggers.
[3] 28,000,000 bullets and 1,000,000 empty capped cases were also supplied.
[4] 2,900,000 cases loaded with bullets were also supplied.
[5] 552,650,000 from U.S.A.
[6] 20,750 aerial torpedoes were also supplied.

Store.	Belgium.	France.	Italy.	Roumania.	Russia.	U.S.A.	Other Allies[1]	Total.
Miscellaneous Stores—								
1916	—	—	—	—	38*	—	—	38
1917	—	—	13	—	25	390,000	—	390,038
1918	—	—	2,648,000	—	—	1,808,360	—	4,456,360
Total Miscellaneous	—	—	2,648,013	—	63	2,198,360[2]	—	4,846,436
Metals (in Tons)—								
Iron and Steel—								
1915	11,445	1,141,723	144,284	—	24,275	—	—	1,321,727
1916	10,067	1,014,554	112,011	—	29,835	—	—	1,166,467
1917	24,084	1,394,693	463,864	—	9,549	3,824	21,637*	1,917,651
1918	21,847	781,423	230,092	—	—	36,927	21,580	1,091,869
Total Iron and Steel	67,443	4,332,393	950,251[3]	—	63,659	40,751	43,217	5,497,714
Alloys, etc.—								
1915	—	6,939	9,807	—	817	—	—	17,563
1916	—	5,204	7,285	—	1,454	—	—	13,943
1917	26	63,310	21,653	—	—	52,164	200	137,353
1918	—	77,052	5,329	—	—	53,153	25	135,559
Total Alloys	26[4]	152,505[5]	44,074[6]	—	2,271	105,317	225	304,418

Non-Ferrous Metals[7]—								
1915	49	3,747	1,934	—	17,361	—	—	23,091
1916	4	9,923	5,012	—	55,248*	—	—	70,187
1917	909	21,411	22,492	—	82,817*	18,792	—	146,421
1918	42	16,097	3,621	—	—	—	—	19,760
Total Non-Ferrous ..	1,004	51,178	33,059[8]	—	155,426[9]	18,792	—	259,459
Total Metals	68,473	4,536,076	1,027,384	—	221,356	164,860	43,442	6,061,591
Explosives and Chemicals (in Short tons)—								
High Explosives—								
1915	—	—	265	—	—	—	—	265
1916	123	—	2,788	100	11,122*	—	—	14,133
1917	354	—	4,550	—	6,615	—	—	11,519
1918	698	—	10,927*	—	—	—	—	11,625
Total High Explosives	1,175	—	18,530	100	17,737[10]	—	—	37,541

* Figures marked thus include some supplies made in previous years for which no details are available.
[1] Includes China, Greece, the King of the Hedjaz, Japan, Portugal and Serbia.
[2] Figures incomplete: include 23,000 components of Livens projectors.
[3] 253,000 tons from U.S.A.
[4] 25,300 silica bricks were also supplied.
[5] 9,630,296 silica bricks also supplied.
[6] 1,679,744 silica bricks also supplied.
[7] Figures incomplete.
[8] 17,390 tons of brass and copper from U.S.A.
[9] 89,165 tons from U.S.A.: 4,360 tons from Canada.
[10] Includes 4,516 tons of T.N.T. from U.S.A. and 1,119 tons of Sikrit from Norway.

APPENDIX V—*continued.*

Store.	Belgium.	France.	Italy.	Roumania.	Russia.	U.S.A.	Other Allies[1]	Total.
Propellants—								
1916	76	—	—	—	22,498*	—	—	22,574
1917	843	—	1,689	200	23,132	—	—	25,864
1918	198	—	1,518	—	—	—	—	1,716
Total Propellants ..	1,117	—	3,207	200	45,630[2]	—	—	50,154
Explosive and Chemical Materials—								
1915	—	139,486	578	—	—	—	—	140,064
1916	1,831*	101,440	9,598	—	117,523*	—	—	230,392
1917	6,924	66,711	16,274	238	29,023	—	—	119,170
1918	6,526	108,131	78,091	—	—	—	—	192,748
Total Materials ..	15,281	415,768	104,541	238	146,546[3]	—	—	682,374
Total Explosives and Chemicals	17,573	415,768	126,278	538	209,913	—	—	770,070
Mechanical Transport Vehicles Motor Cars, Armoured Cars, Chassis and Vans—								
1915	1	—	—	—	477	—	—	478
1916	127	25	—	—	556	—	—	708

1917	149	—	—	—	290	40	—	479
1918	75	12	—	—	—	771	41	899
Total Motor Cars, etc.	352	37	—	—	1,323	811	41	2,534
Lorries, Ambulances and Wagons —								
1915	820	1,170	—	—	19	—	—	2 009
1916	12	1	3	139	730	—	—	885
1917	3	—	—	38	1,427	84	—	1,552
1918	43	—	30	—	—	4,469	497	5 039
Total Lorries, etc. ..	878	1,171	33	177	2,176	4,553	497	9,485
Motor Cycles, Side Cars and Bicycles—								
1915	10,806	—	—	—	980	—	—	11 786
1916	4,325	2,407	2,029	300	1,830	—	—	10,891
1917	9,277	14,900	—	798	7,165	149	—	32,289
1918	863	10,338	406	—	—	2,070	78	13,755
Total Motor Cycles, etc.	25,271	27,645	2,435	1,098	9,975	2,219	78	68,721

* Figures marked thus include some supplies made in previous years for which no details are available.
[1] Includes China, Greece, the King of the Hedjaz, Japan, Portugal and Serbia.
[2] 44,632 tons from U.S.A.
[3] Includes supplies from U.S.A., Norway, China, India, Chile, Japan and Sicily.

Store.	Belgium.	France.	Italy.	Roumania.	Russia.	U.S.A.	Other Allies[1]	Total.
Miscellaneous Supplies—[2]								
1916	—	—	—	—	9	—	—	9
1917	—	—	—	—	510	—	—	510
1918	—	—	109	—	—	1,055	—	1,164
Total Miscellaneous..	—	—	109	—	519	1,055	—	1,683
Total Mechanical Transport Vehicles.	26,501	28,853	2,577	1,275	13,993	8,638	616	82,453
Railway Materials—								
Locomotives and Wagons—								
1915	—	64	—	—	—	—	—	64
1916	—	88	—	—	—	—	—	88
1917	—	—	—	—	3,236	—	—	3,236
1918	—	56	—	—	—	—	—	56
Total Locomotives and Wagons—	—	208	—	—	3,236[3]	—	—	3,444
Material (in tons)—								
1915	—	700	—	—	—	—	—	700
1916	—	1,611	—	—	—	—	—	1,611
1917	—	5,279	—	—	3,589	—	—	8,868
1918	—	10,754	—	—	—	—	—	10,754
Total Material ..	—	18,344	—	—	3,589	—	—	21,933

Aircraft—								
Aeroplanes—								
1916	—	—	—	—	101	—	—	101
1917	—	—	—	19	207	—	—	226
1918	34	11	—	—	—	452	37	534
Total Aeroplanes ..	34	11[4]	—	19	308	452[5]	37[6]	861
Aero Engines—								
1916	—	—	—	—	289	—	—	289
1917	—	—	—	—	360	—	—	360
1918	4	30	—	—	—	77	65	176
Total Aero Engines	4	30	—	—	649	77	65	825
Airships—								
1916	—	—	—	—	6	—	—	6
1917	—	—	—	—	—	—	—	—
1918	—	—	—	—	—	—	—	—
Total Airships ..	—	—	—	—	6	—	—	6
Tanks—								
1918	—	101	—	—	—	18	1	120
Total Tanks	—	101	—	—	—	18	1	120
Optical Instruments—								
1917	—	—	—	851	8,002	—	—	8 853
1918	—	—	—	—	—	12,805	—	12,805
Total Optical Instruments	—	—	—	851	8,002	12,805	—	21 658

[1] Includes China, Greece, the King of the Hedjaz, Japan, Portugal and Serbia.
[2] Tractors, caterpillars, water tanks, disinfectors Foden, fire engines.
[3] From U.S.A. : 1,600 brake equipments were also supplied.
[4] Four without engines.
[5] 213 without engines.
[6] 17 without engines.

Contents of Volume II.

Note.—The contents of this issue are subject to revision, and must be regarded as provisional.