The Squeeze on Nickel

It is distressingly tight and, because one company is 85 per cent of the free world's industry, it is perhaps tighter than it ought to be.

THERE HAS BEEN an acute nickel shortage since July, and the prospects of supply will grow more tarnished before getting bright and shiny again. The eventual brightening will depend in part on annoyed consumers, venturesome new producers, and a busily stockpiling U.S. Government—and what they may do to effect a partial reform of the nickel-producing industry. In any event, the world of nickel deserves a look in this transitional hour made loud by the clash of metals.

Nickel-specifying armament orders and letters of intent are still in the trickle stage and, anyway, the substantial amounts of nickel embedded in the structures of mothballed World War II ships that are now being recommissioned take some rearmament pressure off nickel miners. But the metal, of major importance in the surging pre-Korean economy of alloy-bearing automobiles, washers, TV sets, and what not, is crucial in the new production that began to be poured into the economic melt on June 26.

Jet engines cast a highlight, for one might as well call them nickel as steel engines. Many jet parts contain six or seven metals, including lots of nickel. Nickel stabilizes the whole superalloy at high jet temperatures, warding off gremlins like oxidation and "creep" and thus adding to the engine's life. In atomic equipment, gun recoil systems, bullet jackets, bomber fire walls, aircraft exhaust valves, and so on, steel's resistance to high temperature and corrosion is largely dependent on nickel. Nickel makes engineering steels tough for armor, airplane crankshafts, motor-vehicle parts, etc.

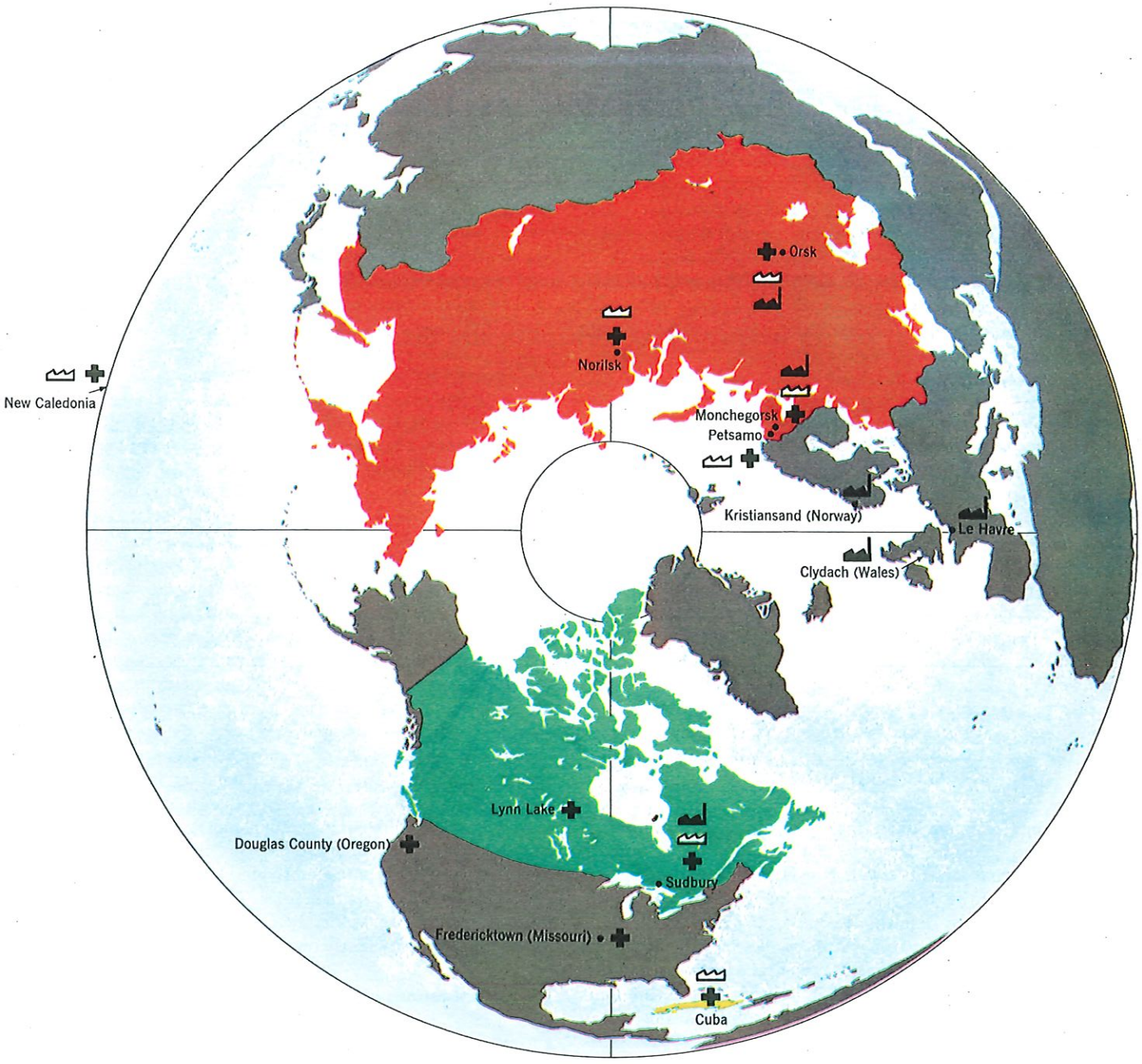
Because there is not enough nickel, automobile "brightwork," which is never pure chromium, is likely to disappear after January 1. Some critics of traditional Detroit decorative impulses would thus be pleased, but if the civilian industry is to make maximum nickel savings, it will have to change more than its taste in trim. It will have to use much less nickel in many structural and mechanical parts. Also, such desirable but nonessential applications of high-nickel stainless steel as kitchen sinks and building façades may soon be barred for the duration of the emergency.

The pressure on nickel is in part due to the innate conservatism of engineers and melt foremen in armament steel mills. They are used to nickel and they naturally dread any change in their melts. In the World War II shortage, some U.S. steel technicians even resisted shifting from virgin nickel to a nickel oxide, when the latter first appeared on the market. Putting the oxide over took a lot of hard work, in which Molybdenum Corp. salesmen, who stood well with the technical men, lent a helping hand. The fact is that the amount of nickel used in some steels can be safely reduced by substituting another alloy metal, say molybdenum (of which the U.S. has a lot) or chrome (of which it has little). This was done in World War II to produce "National Emergency" (N.E.) steels. And more could probably be done about this than is being done.

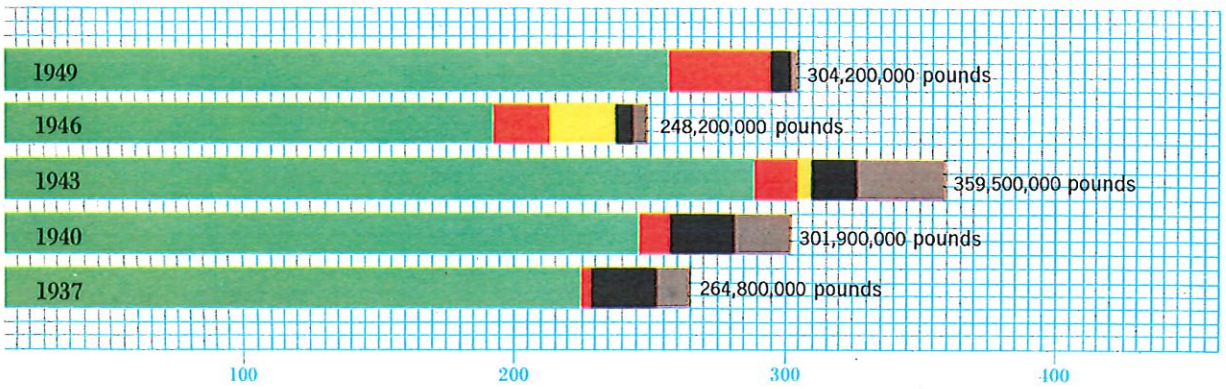
But there are technical limits to substitution if specified results are to be achieved, and so steelmen cannot by themselves close the present gap between supply and demand. The gap is so great that the free world's nickel industry has put new customers outside the pale and clamped allocations on old ones. The cutback on some is as great as 50 per cent. Some furnaces have been pulled off high-nickel steel production, the armament variety. The U.S. steel industry is prepared on short notice to shift as much as possible to N.E. steels, some of which have been rechristened triple-alloy steels. Nickel was on the first inventory-limitation list and the credit squeeze on consumer durables is partly motivated by the nickel shortage. Also, nickel scrap is way up in price. The Senate's rearmament watchdog committee, headed by Lyndon Johnson, is spending time on nickel, particularly on the pricing aspect.

The nickel monopoly

IF LESS IS HEARD about the nickel than about other metal shortages, the reason may be the same as that which accounts for relative public ignorance about the nickel industry in general. Nickel is a small and rather underground world. When Administrator William H. Harrison of NPA wanted to talk about the steel shortage, he had to assemble twenty-one U.S. steel producers. For copper and zinc he called in nine producers each. Although for nickel he politely included the two Western Hemisphere producers, he could have done his job just as well had he ignored Canada's Falconbridge Nickel Mines Ltd. For Falconbridge has only 10 per cent of the free world's production and its market is chiefly in Europe. In the event of global war, Falconbridge's mine in Ontario would almost surely be an orphan as it was the last time, when the enemy seized its only refinery, located in Norway. One nickel-hungry U.S. steel executive had never heard of Falconbridge until September. That is because it is so small compared with



Nickel production (virgin metal)



- Ore bodies
- Mills, smelters
- Refineries
- Canada (overwhelmingly Inco)
- U.S.S.R. (Glavnikelkobalt)
- Cuba (Nicaro)
- New Caledonia
- All others

Russian data from Minerals, A Key to Soviet Power *by D. B. Shimkin, forthcoming, Harvard University Press*

Nickel—free and Russian

Shown on this map are the free world's mines and facilities producing all but 1 per cent of the nickel annually available—about 300 million pounds last year—plus mines whose ore is now being studied or worked on a pilot scale, plus the Cuban mine and nickel-oxide mill that is likely to be reopened after more than three years of somnolence. The missing per cent is dribs and drabs in a half-dozen countries. Every free-world mine and facility shown is within range of Russian bases for Russian-type B-29 bombers, with the dubious exception of New Caledonia. That island and Nicaro are vulnerable to shelling from submarines. Also shown are Soviet nickel sources and facilities, all run by a state monopoly, Glavnikelkobalt. Like Germany's in World War II, Russia's armorers must painfully feel the nickel pinch, but Russian armies never expect the American kind of industrial backing. The total annual Soviet production can hardly top 37,500,000 pounds; about half comes from the Petsamo mine and smelter, sold to the Soviets when they took part of Finland in 1944. The seller was Canada's great monopoly, The International Nickel Co. (Inco), owned by many shareholders in the U.S., Canada, and Great Britain. The price was $20 million.

the one producer no U.S. customer can forget: The International Nickel Co.

Inco, as the company is called in the trade, was created some years after the breakup of a nickel cartel once formed in the industry to stop cutthroat competition. It dates back to a 1929 merger of competitors with neighboring mines located beyond the reach of the Sherman Act, to wit, in Canada. Inco's executive offices are in New York City but it is a Canadian corporation. It has enjoyed a more or less God-given monopoly ever since men made the merger: exclusive possession of the largest-known nickel ore body, which also happens to be handy to about half of the world market—U.S. industry. It has reserves of over 250 million tons of nonferrous metallic ore in Ontario alone. It is the world's biggest platinum producing unit, the sixth-largest copper miner, and a producer of gold, silver, selenium, tellurium, and cobalt. It is also about 85 per cent of the free world's nickel-mining industry.

Inco handles 10 million tons of ore a year, mills and smelts in Ontario, refines nickel there and in Wales, runs nickel rolling mills and foundries in the U.S. and Great Britain. It produces electrolytic and pig nickel, various nickel alloys (Monel, Inconel, Nimonic), and nickel oxide. It sells about 90 per cent of its product outside Canada, and it is the dominant source of the nickel consumed in the U.S. Wholeheartedly against economic nationalism, Inco has also been very resourceful in developing new uses of nickel. It has an impressive research staff. For years it was able to hold nickel prices stable and, whenever more capital was needed for its vast operations, to raise it.

But now, cry the consumers, nickel is terribly short. So, of course, are a lot of other metals and for complex reasons—including some consumer conservatism as in nickel's case. But this much is simple: nickel would be 10 per cent less short had not one competitor of Inco gone to the wall in 1947. That may have happened because of a condition that is entirely proper under the laws of Canada. It is the condition of unregulated monopoly. Here price structure is a key criterion of judgment for anti-monopolists.

The basis of Inco's prices (Falconbridge merely trails behind) is unfortunately not publicly known. While other metal prices vary widely even over relatively brief periods, nickel never fluctuated from 1929 to 1946—years of widely shifting costs. Between 1946 and mid-1950 it rose about 60 per cent. This rise—or much of it—could be taken for granted in most industries, because of increasing costs. But in view of their history, a question arises as to whether costs ever had anything to do with nickel prices. To answer the question one would have to work for Inco, because some key data are a trade secret.

Costs, of course, can be affected by management. And while few miners say that Inco's management is obese, sentiment is general that (unlike the other great British Commonwealth metal monopoly, Australia's domestic-selling steel producer, discussed elsewhere in this issue) it is not very muscular. It is almost certainly not as muscular as in the days when Robert Crooks Stanley, a developer of markets in the grand style and now Inco's seventy-four-year-old Chairman, by sheer hard work made nickel a *sine qua non* of the steel industry. Inco management could be Joe Louis—but there is no Ezzard Charles on the scene.

To some U.S. consumers the fabrication of items with high nickel content is central. These are not typically the subsidiaries of the gigantic U.S. Steel Corp., which all together use only about 14 per cent of the nickel consumed by the U.S. steel industry. Materially smaller Republic Steel, on the other hand, is responsible for about 21 per cent of the U.S. steel industry's total nickel consumption. Allegheny Ludlum Steel, American Rolling Mill, and Crucible Steel, and such manufacturers as Timken Roller Bearing, which produce their own high-nickel steel, are also nickel-oriented.

One steel-company officer recently sandwiched these remarks between two declarations of praise for Inco: "Chairman Stanley of Inco is on the Board of U.S. Steel. They don't have to worry about their nickel. I do. But I wouldn't try to solve my problems by an independent supply of nickel unless I could produce all my needs and a surplus. I can't be sure of managing that, and so I can't risk being cut off by Inco."

PERHAPS SUCH FEARS are unjustified. Certainly such an act of discrimination by Inco would violate the consent decree that the company entered into in 1948 to terminate an antitrust action brought against it by the U.S. Government. The decree is full of words but provides little more than that Inco, which fabricates nickel products in its subsidiary Huntington, West Virginia, mill, must sell both Huntington products and products provided by Inco to Huntington at a fair price to any U.S. fabricator that wants them. Had the U.S. Government tried to get more than that, Inco might successfully have challenged its jurisdiction.

At times the U.S. armed forces, like U.S. steelmen, have been annoyed by Inco. Having had a bad time after World War I, Inco wanted no further experience of overexpansion nor any leftover war stockpiles. Now, the armed forces do not consider a material stockpiled unless it is within the U.S., but in World War II Inco disagreed. Canadian warehouses, it argued, were handy enough and as safe as any in the U.S. Bill Batt debated the question with Inco for the U.S., but Inco held firm. Being one of Canada's largest corporate U.S. dollar accumulators, it gets a lot of Canadian Government backing. In any case, though a lot of nickel kept coming along, the

stockpile always was puny. Current stockpile figures are a military secret, but they are probably not impressive either.

Inco has no monopoly on producing the present trouble in nickel. But it is difficult, no matter how you refine it, altogether to separate trouble in nickel from Inco policy. Since Inco is 85 per cent of the nickel industry, most complaints against the industry are addressed to it, which may sometimes be unfair. That it is not always unfair is suggested by the story of the Nicaro Nickel Co. This venture began in 1942 after the OPM put nickel under allocation order.

The Nicaro story

THE FREEPORT SULPHUR CO. spent $32 million of RFC funds in great haste to build Nicaro's mill in a Cuban jungle (see "The Building of Nicaro," FORTUNE, July, 1945), near nickel ore owned by Freeport. Early in 1947 Nicaro shut down. Many in the trade think that, had Inco not behaved as it did when Nicaro's fate was in the balance, the operation might have survived.

When Nicaro started, it made an abortive try at refining pure nickel in Wilmington. Then by great effort it established nickel oxide as an acceptable alloy, especially in electric steel furnaces. And while few items at World War II fronts contained Nicaro nickel, a lot of Inco nickel won timely release from the pipeline thanks only to the fact that Freeport got Nicaro into production—and in a remarkable hurry. Nicaro got out of production fast, too. Price was decisive, and Inco sets nickel prices.

For many years after 1929 the contract price of Inco electrolytic nickel to steel companies was 29½ cents per pound. In 1944 Nicaro first offered oxide at 27½ cents per pound of contained metal. U.S. steel manufacturers took all that Nicaro produced. But on November 21, 1946, with the war over, Nicaro announced that it would quit business in two months.

Four days after the announcement, Inco raised the price of nickel to 35 cents. It also announced a product new for Inco: nickel oxide. It is in the form of a sinter, a sort of clinker, easy to handle. Inasmuch as Nicaro had shown that a differential of 2 cents could easily sell an oxide, Inco, the price leader, might have sold its sinter at 33 cents per pound of contained nickel and so have made optimum profits. In its last days Nicaro raised its price to 33 and held its customers. In fact, some customers agreed to contract for two years at 33 cents if Nicaro would continue in operation. But Inco fixed a price not over 30 cents. The objective of this low price is a matter of some dispute.

Nicaro, in any case, faced this question: since Inco arbitrarily set a differential of 5 cents in favor of the oxide, might it not later set one of 7 cents or 10 cents? Under such circumstances, was the hope for a renewal of contracts at 33 cents realistic? Along with a final RFC refusal to lease Nicaro on terms acceptable to Freeport and approved by Munitions Board Chairman Richard Deupree, the pricing situation was decisive. Nicaro closed on March 31, 1947. On January 1, 1948, the U.S. tariff was cut 1¼ cents and Inco made a comparable price cut. Sixteen months after Nicaro had closed, Inco raised its nickel price to 40 cents and its nickel-oxide price to 36¼ cents. On June 1, 1950, came a new boost—20 per cent, bringing nickel to 48 cents and the oxide to 44¼.

"Inco," wrote FORTUNE in 1945, "is hardly likely to make the masochistic attack on prices that, it seems, alone could imprison Cuban nickel in the ore." And, in general, Inco was not masochistic after the war. It raised nickel-metal prices. But with respect to nickel oxide it was indeed masochistic, if only transiently. Thereafter, if not therefore—this could all have been coincidence—no more Cuban nickel was freed. One responsible steel executive recently summed up as follows: "Once Nicaro was turned back to the jungle, the price of nickel went up and there has been relatively little peace for the nickel consumer since."

If reports of the attitude of Inco men during the period of Nicaro's building mean anything, this retreat did not displease Inco. Indeed, RFC stiffness toward Freeport may have been due in part to Inco pressure exercised via dollar-needy Ottawa and the State Department, which does a lot for Cuba on sugar and may have wanted Canada to earn U.S. dollars from nickel. In view of all that has happened since 1946, it might be argued that Freeport should have been a bit more venturesome with Nicaro. But the business of nickel, as is explained in Inco's 1949 report to shareholders, is so dependent on world political developments that to forecast even for a year "would imply an attempt to predict the trend of world affairs." In any case, Freeport might have taken a licking in Nicaro and there is barely room to contend that staying on would have been sound venturesomeness rather than foolhardiness. It is not beside the point that, after Freeport threw in its cards, the U.S. Government never found another enterpriser interested in reopening Nicaro on the government's terms. The government was, perhaps, too timid. Some of the money it saved by not making terms with Freeport has gone into maintenance and more will go into reconditioning when the mill is reopened.

Freeport will not again willingly operate the mill, according to President Langbourne Williams. Key Nicaro men have left Freeport or are deep in matters of sulfur and oil, to which the company is now largely restricting its interests. To provide a competent top team to run Nicaro, Freeport would have to strip its organization. But Freeport would like to sell its ore and is encouraging American Smelting & Refining to take over the mill. Big A. S. & R. could probably staff Nicaro without damaging itself and it also might contrive what Freeport could not—to stay in business competitively after the emergency regardless of Inco. In any event, a survey party will soon report on the physical condition of the Nicaro mill and a deal is likely to be made to reactivate it.

Nickel potential

THERE IS LITTLE USE in looking to Inco for substantially increased production. The company used its best ore (2.2 per cent nickel, as opposed to the present 1.2 per cent) during World War II. Its metal capacity from the ore now handled is reported to be only two-thirds of what it once was despite added facilities. To produce more it would have to make a heavy capital investment on top of a $40-million investment completed during World War II and added to since then—and this in the face of a steady decline in its reserves' total metal content. True, Inco has an untouched ore body in Venezuela, but this is far from coming into operation. Inco

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also has properties in northern Manitoba (Lynn Lake), but their nickel content is of dubious significance. So, as a quick survey of the leading units will show, are prospects of immediate relief from other fields.

Falconbridge is increasing its mining, smelting, and refining facilities, and within a year its metal-production rate should go up a couple of per cent of the free world's total. Before Falconbridge could put new capital into further expansion, it might have to build the North American refinery it lacked during World War II, when it was shut out of Norway and had to run its ore through Inco's refinery.

The mines on France's Pacific island of New Caledonia, belonging to La Société le Nickel, may by the end of 1951 achieve an annual output of 22 million pounds of metal. ECA has earmarked $965,000 for machinery and equipment toward this end. The amount used will be repaid in metal. But New Caledonia is a logistical problem at best and a bad one in time of war. To run its smelter, coal must be shipped from Australia. Then the matte must be hauled a great distance—to Le Havre or, as when the Nazis held the French refinery, to North America. And the island is submarine-vulnerable.

A SIZABLE nickel and copper deposit of fair grade is being developed at Lynn Lake in Manitoba, by Sherritt Gordon Mines Ltd., which is an experienced copper producer. A pilot plant is working on metallurgical problems. Lynn Lake could produce 16 million pounds of nickel a year with the equipment now becoming available at a wasting Sherritt Gordon copper mine farther south in Manitoba. But first a power plant and a 160-mile railroad will have to be built, and at the present rate of development it will be late 1953 before any metal begins to come out of the Lynn Lake region.

The state of Goyaz in Brazil has a lot of high-grade nickel ore that the American Smelting & Refining Co. wanted to work several years ago. After spending about $2,500,000 in development and test work, A.S.& R. gave up. Costs were too high, capital demands too massive, local mining laws too discouraging. Despite recent highway construction between the ore and the nearest railhead, there would at best be a long interval before quantity production, and there would always be the sea-lanes problem.

The U.S., which has thus far produced only tiny amounts of nickel as a byproduct of other ores, has one refractory-nickel source of potential importance in Douglas County in southwestern Oregon. M. A. Hanna Co., which two years ago acquired the ore body, is engaged in an intensive and difficult metallurgical study. Hanna envisions the possibility of "eventual" production of several million pounds a year.

Nickel is also obtained by the National Lead Co. as a byproduct of working a complex ore at Fredericktown, Missouri. As the lead and copper are refined out, a nickel concentrate is put aside in storage ponds with a view to further treatment, which must await the perfection of a process. According to National Lead, commercial production of its nickel is anywhere from one to five years away. Even then, the annual nickel production is unlikely to come to more than 500,000 pounds or a mere two-tenths of 1 per cent of the present total available to the free world.

There are nickel deposits in Skagit County, Washington, and Alaska, but their future is not particularly promising.

Nowadays any consideration of nickel's future must make a bow to the possibilities of titanium metal. Several U.S. concerns are striving to improve titanium metallurgy and to cut the price so as to effect large-scale use as a substitute for some

The Squeeze on Nickel *continued*

forms of nickel steel. Practical methods, however, are still unavailable. (On titanium technology see FORTUNE, May, 1949).

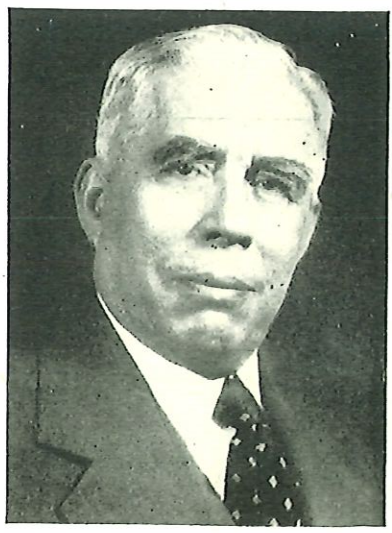
Stalin and nickel

THERE REMAIN to be considered the views of the Soviets' man of steel on the free world's nickel. If all of it be considered as a dozen eggs, eleven are in a forty-mile-square basket in Ontario's Sudbury Basin. Stalin's Canadian agents might be abler saboteurs than any the Nazis had. He also has better long-range bombers and bombs. The Nazis, of course, never tried to hit the Sudbury nickel basket, but they lost their war. Were the Russians to hit Sudbury early in one of theirs, they might come closer to winning.

For the remaining eggs would be far-off New Caledonia and, presumably, Nicaro—not enough by far for the steel omelet of U.S. rearmament. The danger of bombing and sabotage was a major reason for government support of Nicaro in World War II, and the military has not ceased to worry about the problem. All the more reason to take the present shortage seriously.

Not that Inco fails to. Surely it would modify its policy if it could clearly foresee indefinite growth in demand. Surely because, for one thing, it has not shown such ability to increase earnings as to induce many of the big institutional investors that used to hold its stock to stay with it. While U.S. Steel earnings climbed from $2.67 in 1937 to $5.39 in 1949, those of Inco dropped from $3.32 to $2.08 in the same period. But—returning to Inco's 1949 report—foreseeing the trend of world affairs is not part of Inco's business. As on so many, Korea burst on Inco, and so could peace. Were its managers now to loosen up on policy, they might someday face a glutted market. And since metallurgy, after all, is no science but merely what has been called "the art of making money in the treatment of metals," Inco wants to make money.

So, of course, would any operator of Nicaro, and this time he might. Were he to remain open after the emergency, he would help to reform the industry. Nicaro's reopening, in any case, would boost the annual supply of nickel anywhere from 25 to 32 million pounds, the first being the top achievement during World War II, the second the rated capacity. It would be in getting Nicaro going fast, and possibly in speeding up other nickel ventures through stockpiling contracts, that the U.S. Government, whose authority over Inco is dubious, might best relieve the squeeze on nickel. END



Man of Nickel

Robert Crooks Stanley, Chairman of the Board of Inco, is a mining engineer, a metallurgist, and a supersalesman. In 1929 he wedded corporately the two competitively owned segments of a great Ontario nickel ore body—the Frood. Thus he created a bonanza of a mine and Canada's great God-given monopoly of one armament-essential alloy metal.