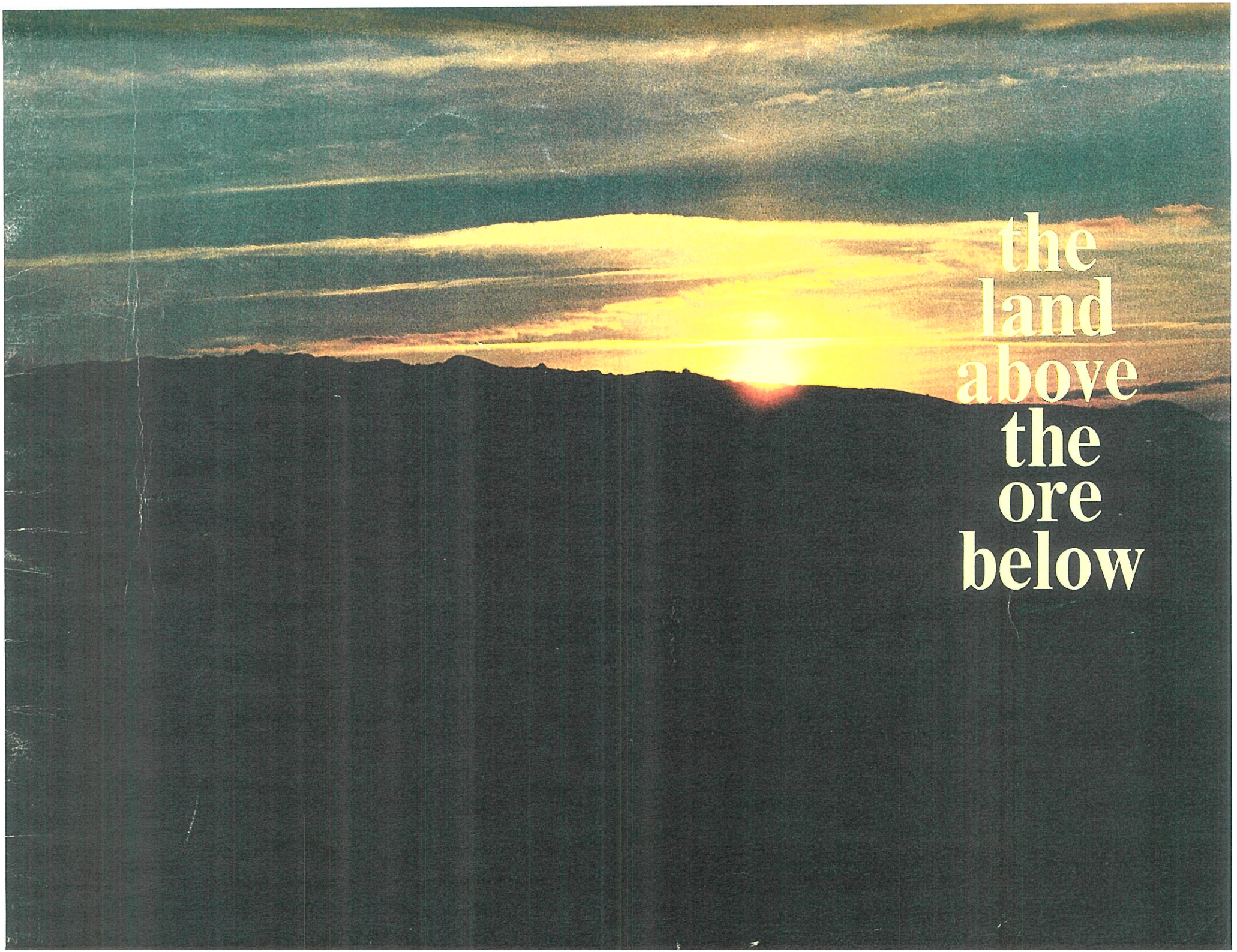

the
land
above
the
ore
below

Perspective on a unique area

"The back side of the moon"
"Pittsburgh without the orchestra"

Most Sudburians have learned to accept such slurs on their community in a spirit of good humor, although not a few proud citizens, pushed beyond their limits of endurance, have been known to "blow their stacks" when hearing an outsider compare their home to a hinterland.

Sure, it's different; there is no other place like it in the world. Sure, it's rocky, barren and – to the uninitiated – rather strange looking. Sure, it could use a face-lifting to make it more "ordinary", more aesthetically appealing. Much of the land in the district is scarred, but one doesn't have to look hard to find greenery, and even exceptional beauty.

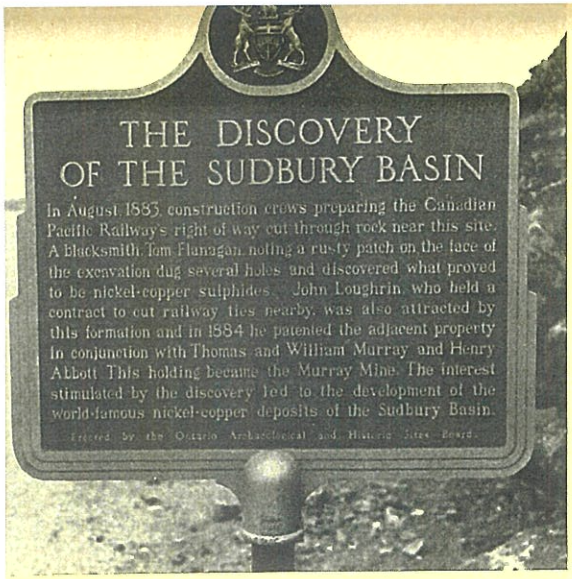
There is much in the unique qualities of the District to be proud of. It is the most important nickel producing area in the world, and nickel has been one of the most important – if not the most important – metals that have contributed to 20th century progress. The discovery and development of the Sudbury ores has been ranked in importance to Canada to the building of the Canadian Pacific

Railway. Had it not been for the faith and dedication of the nickel pioneers, there wouldn't be a Sudbury and its substantial contributions to the nation and the world.

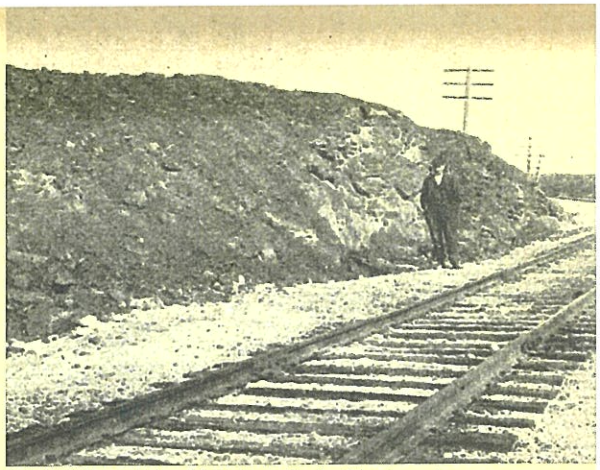
It was the activities of the men who developed the District that precipitated the problems of land erosion that have perplexed us in more recent times. Actually, lumbering activities well before the turn of the century to meet the growing demand for timber triggered the process of denuding the Sudbury Hills, which held great stands of white pine and other species until the middle of the last century.

After the lumber men had taken away all the pine, leaving less marketable trees and other growth, the mineral prospectors moved in and burned off fallen slash and topsoil – often indiscriminately – to expose the rock of the Great Canadian Shield and glimpse its rich mineral deposits.

Then came the practice of outdoors heap roasting to obtain nickel and copper from the ores, and smoke rich in sulphur dioxide poured over the




Often reckless, but always daring, resourceful and industrious.


The building of the CPR through the District – shown here intersecting the Murray ore body – led to discovery of the rich mineral deposit.

countryside killing what few trees and other vegetation remained. In fact, the gas has a troublesome preservative quality that is evident in the thousands of dead tree stumps that still litter the district.

With the rock exposed and the vegetation gone, erosion followed to complete the denuding process.

The devastation was complete by 1920, and since that time damage by sulphur dioxide fumes has been relatively minor, and in fact has decreased as improved technology has enabled better control of gas emissions.

There is still a lot to be accomplished in the areas of reclamation and pollution abatement. But, put in the proper perspective, one realizes that the nickel mining industry has come a long way since those often reckless, but always daring, resourceful and industrious pioneers trudged westward and northward to chart and develop an important new frontier.

1890

The thousand-plus residents of Sudbury certainly weren't prototypal of the sophisticated Gay Nineties era. They were simple pioneering folk, often seen slogging through mud in knee high rubber boots to attend a dance or shivaree. They went to work at the Copper Cliff mine and smelter by stagecoach, or walked along the railroad tracks.

The first newspaper, the Sudbury Journal, was one of the earliest anti-pollution voices, campaigning hard for pure drinking water, the only source being a creek that ran through town and served as a common sewer. The area was singularly unattractive. Sulphur fumes from the Copper Cliff roast yard – the first of many open air roast heaps—were denuding the land, already heavily deforested as a result of extensive activity by lumber companies and by forest fires that ravaged the Sudbury hills earlier in the century. The mine and smelter also consumed thousands of cords of wood every year.

But Sudburians seemed to take the plight of the land in stride, secure in the knowledge that they were riding high on the new riches promised by the mining boom. The town was incorporated in 1893 after a "company of 100" leading citizens petitioned the Lieutenant Governor of Ontario, confident that an era of growth and prosperity had begun.

Prosperity seemed assured following the development a few years earlier, in 1887, of the commercially successful Orford process for separating nickel and copper. In 1890 a second furnace was installed at the Canadian Copper Company's Copper Cliff smelter which had been brought into operation in 1888. There was a promise of substantial new markets for Canadian nickel, thanks to a new demand for nickel-bearing steel and important developments in refining, such as the Mond process.

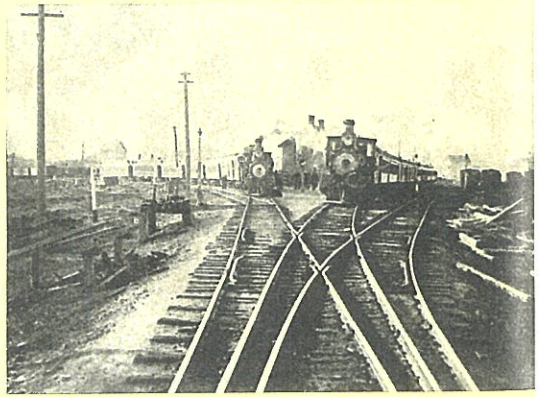
By 1892 four companies were producing in the Sudbury district, but by 1897 only the Canadian Copper Company, forerunner of International Nickel, was able to hold its own, with five mines and five furnaces at the Copper Cliff smelter.

The short-lived Spanish-American war in 1898 gave another big impetus to nickel, after American warships clad in nickel steel armor destroyed almost the entire Spanish fleet without the loss of a single vessel.

In 1899, the Canadian Copper Company opened three pits in the Clarabelle group and started open pit mining on a small scale at the Frood mine. A new smelter, known as the West smelter was opened at the end of the century. Rapid growth of the nickel mining industry meant more work for the roaster yards, more vegetation destroying sulphur fumes . . . but to the people of the district the most important results were more jobs and greater prosperity.

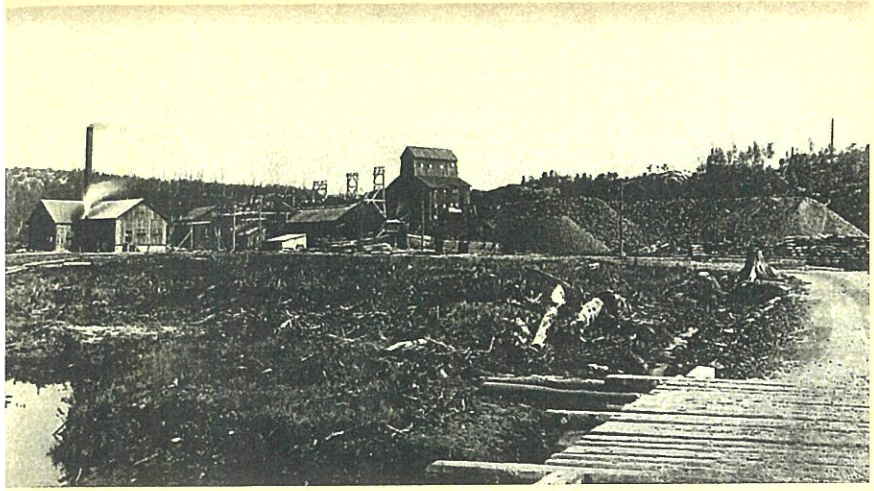
Copper Cliff, 1890, a pioneer village.

Provisions for a bustling community.

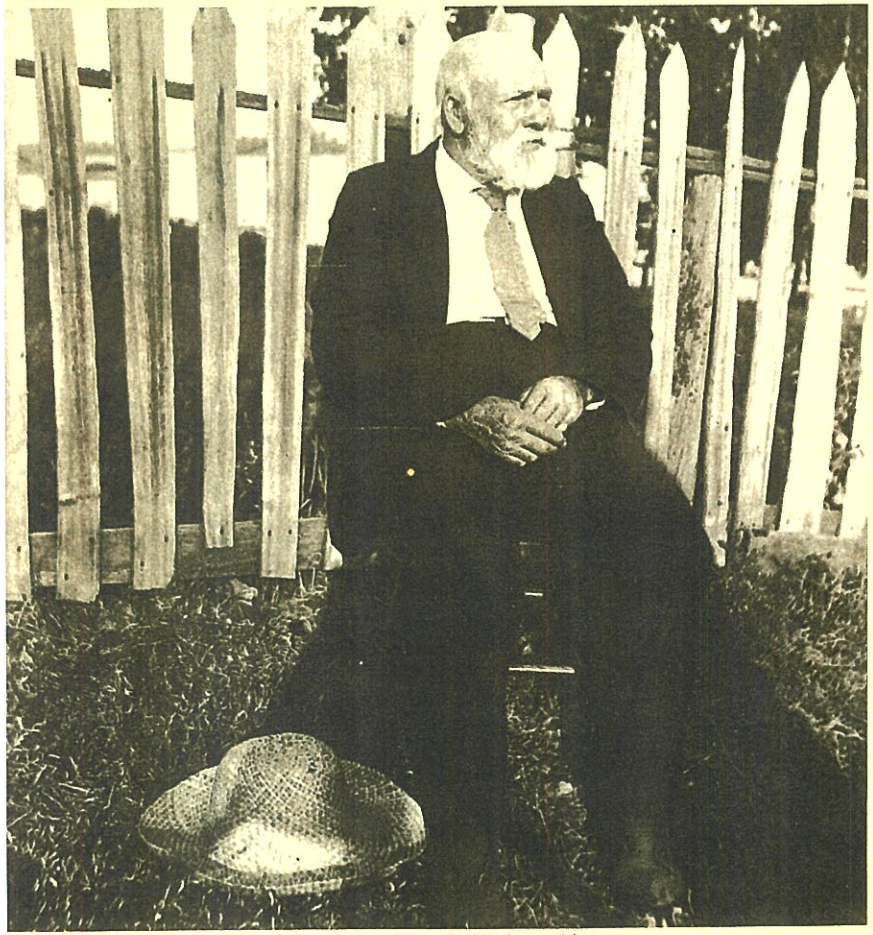


Nickel-copper life line.

First house in Copper Cliff.

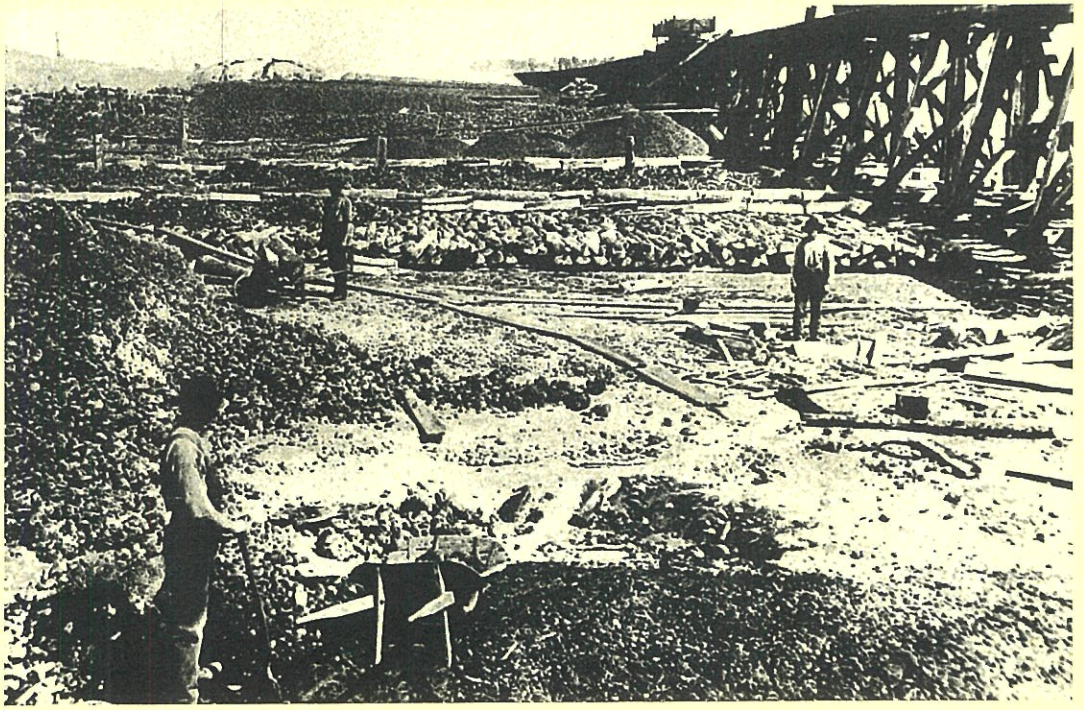


Copper Cliff mine.

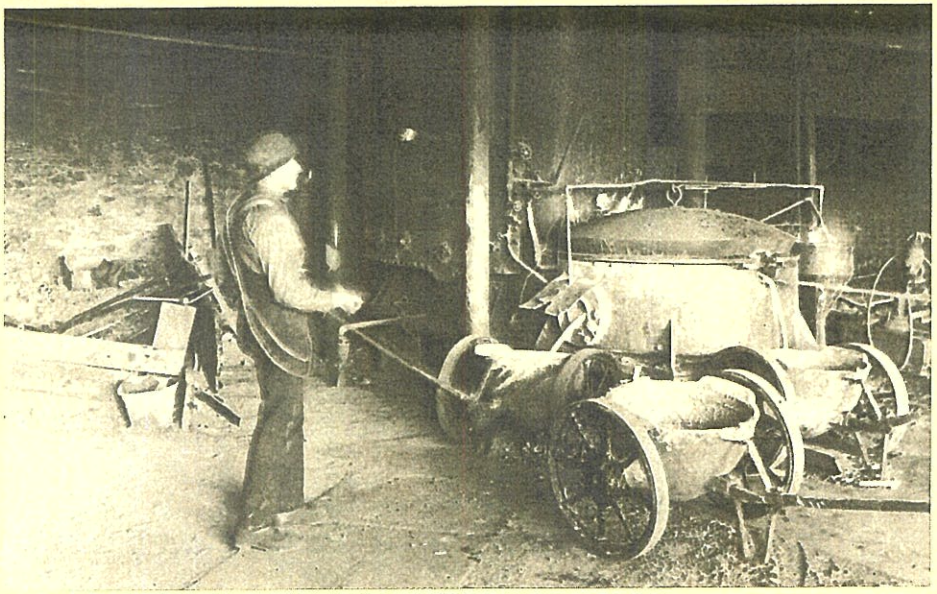


Pioneer Thomas Frood located famous ore deposit that bears his name.

Note candles for lamps on early Copper Cliff miners' hats.

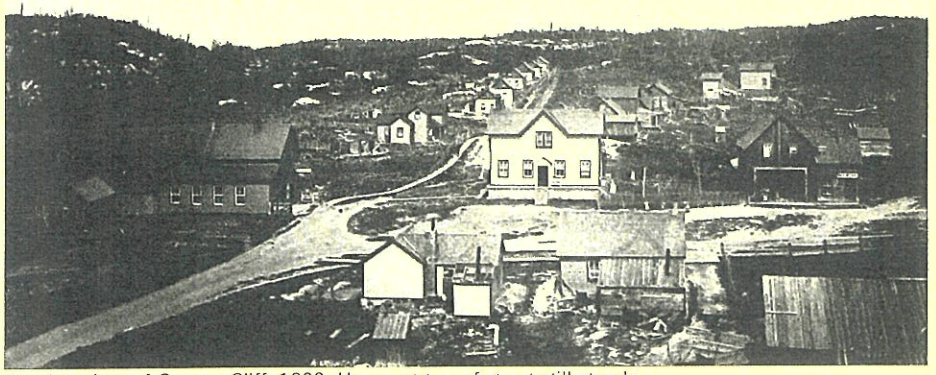


Copper Cliff roast yard.

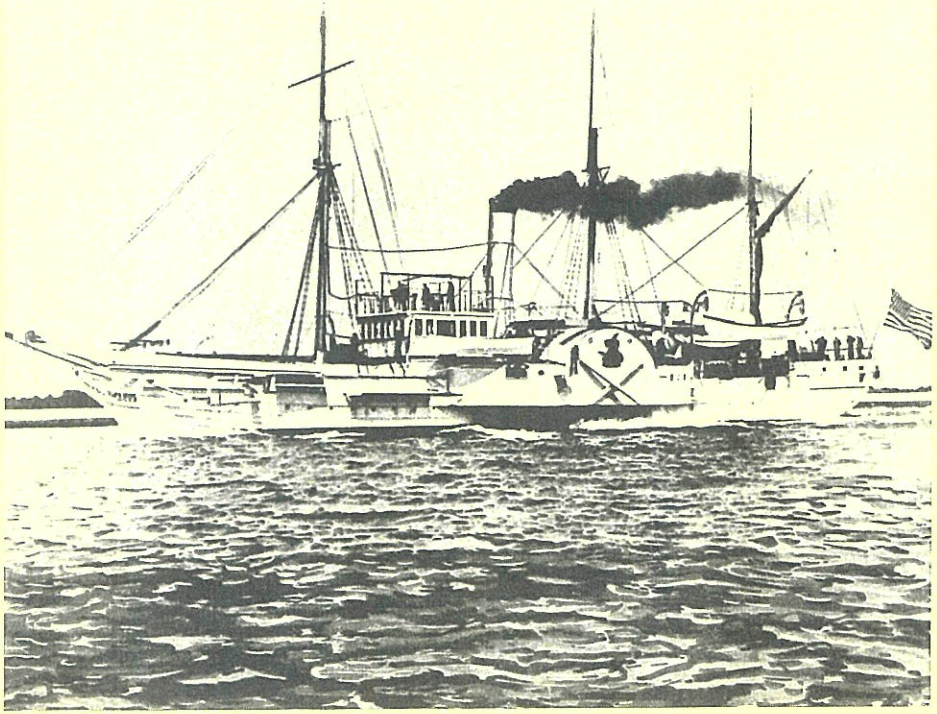


Primitive, but effective first smelting at Copper Cliff.

Breaking and stockpiling matte in smelter yard.



Another view of Copper Cliff, 1892. House at top of street still stands.



Success of metal-clad ships gave big impetus to nickel steel for armor, armaments.

The boys in the band, Elm Street, Sudbury, 1892.

1900

At the turn of the century Sudbury was a bustling town of 2,500. There were about 5,000 lumber workers in the district as well. The nearby town of Copper Cliff was also growing, and boasted a bank, a clubhouse and a doctor's house with a real verandah.

The dilapidated railway station in Sudbury was finally replaced with a new CPR station in 1906, and the first passenger train arrived in 1908.

There was a new emphasis on culture, too, and residents dreamed of an opulent theatre, which became a reality with the building of the Grand Opera House in 1909. The Wonderland theatre was another popular spot. It featured spotlighted pictures on a screen, with a singer to entertain. That was the forerunner of the bioscope, or silent movies which were soon to follow.

The mining industry, which was responsible for rapid community growth, was also expanding. New mining properties were being acquired throughout the district. The Canadian Copper Company started stripping operations in 1900 at Creighton mine. A new plant was erected at Copper Cliff to upgrade the company's copper-nickel matte. Preparations for a roast yard, smelter and townsite were underway at Victoria Mine station, to be operated by the Mond Nickel Company.

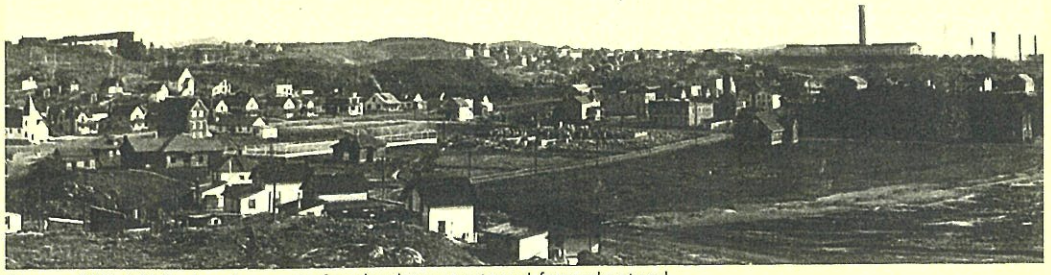
In 1901, the Canadian Copper Company operated no less than 80 roast heaps and nine furnaces. In that year one of the first efforts to control pollution was introduced at the West Smelter, which involved a better means of recovering flue dust and the use of some unroasted ore in the furnace charge.

In 1902, the International Nickel Company was formed from a merger of a number of companies. The largest of the subsidiaries, the Canadian Copper Company, started to plan construction of a new smelter to replace the East smelter, and part of that plant remains in operation today.

In 1904, living conditions in Copper Cliff were improved considerably by cessation of heap roasting in a yard close to the residential section and upwind of it during prevailing winds. The original roast yard, some distance east of the village, continued to operate, but the main supply of roasted ore was obtained from a new roast yard northeast of the West smelter site, usually downwind from the homes.

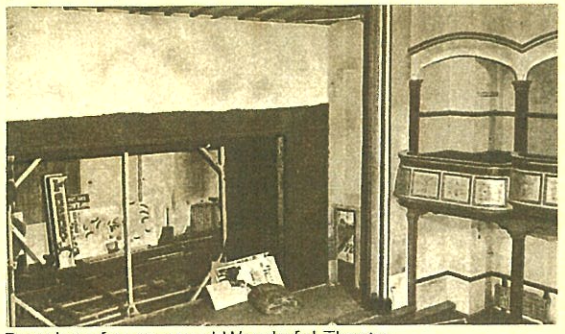
Almost immediately, programs were devised to restore vegetation to the townsite in the form of shade trees and lawns. The town park now occupies the site of the discontinued roast yard.

During the first decade of the new century a number of innovations and technical developments improved the smelting and refining of Sudbury ores, and this resulted in a degree of control of sulphur dioxide emissions. For example, by 1909, only 60 per cent of the ore from Garson and Victoria mines was being heap roasted to reduce the sulphur content, while 40 per cent was being smelted directly.



Copper Cliff, 1910, showing part of park where roast yard formerly stood.

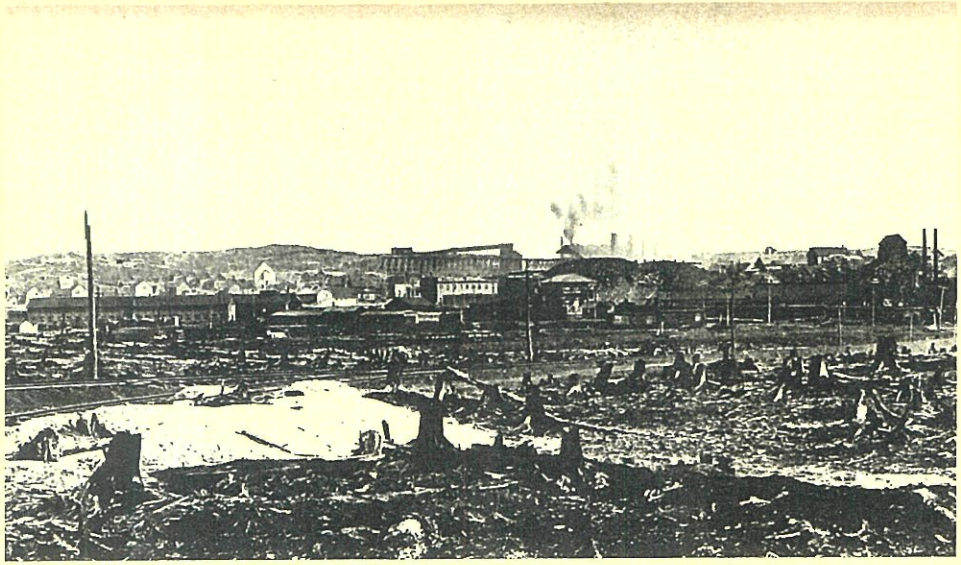
Logging train, a common scene.



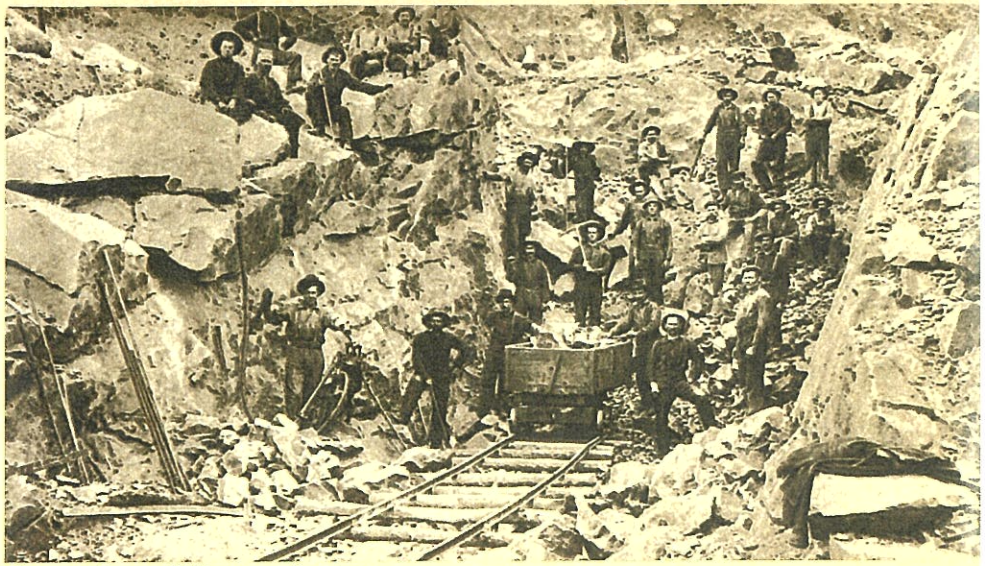
Remains of once proud Wonderful Theatre.

Horseless carriage had not yet replaced old Dobbin.

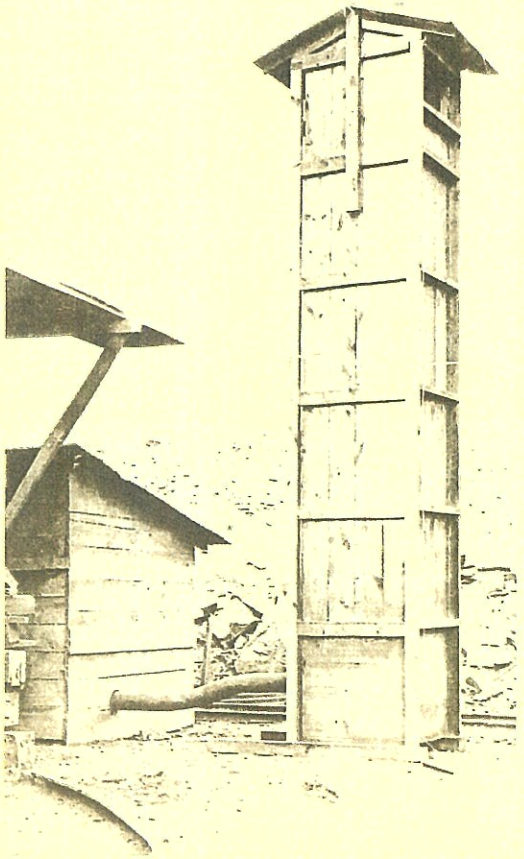
A tennis match was a social occasion.



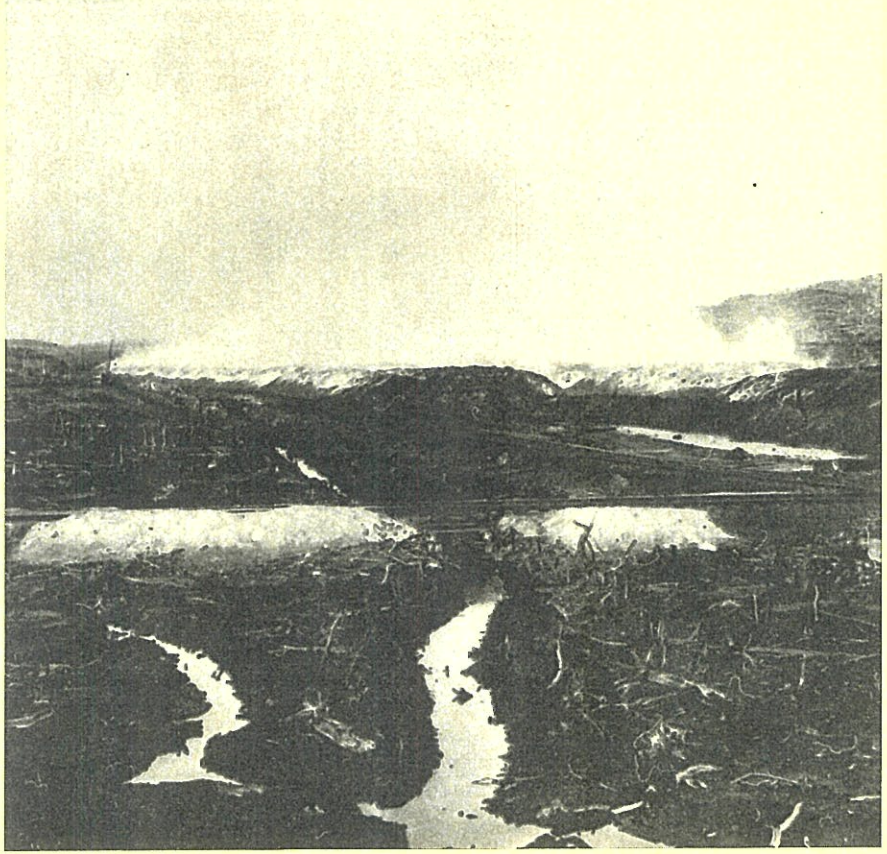
Copper Cliff mine and West smelter, 1903.



Miners at Copper Cliff at turn of century.



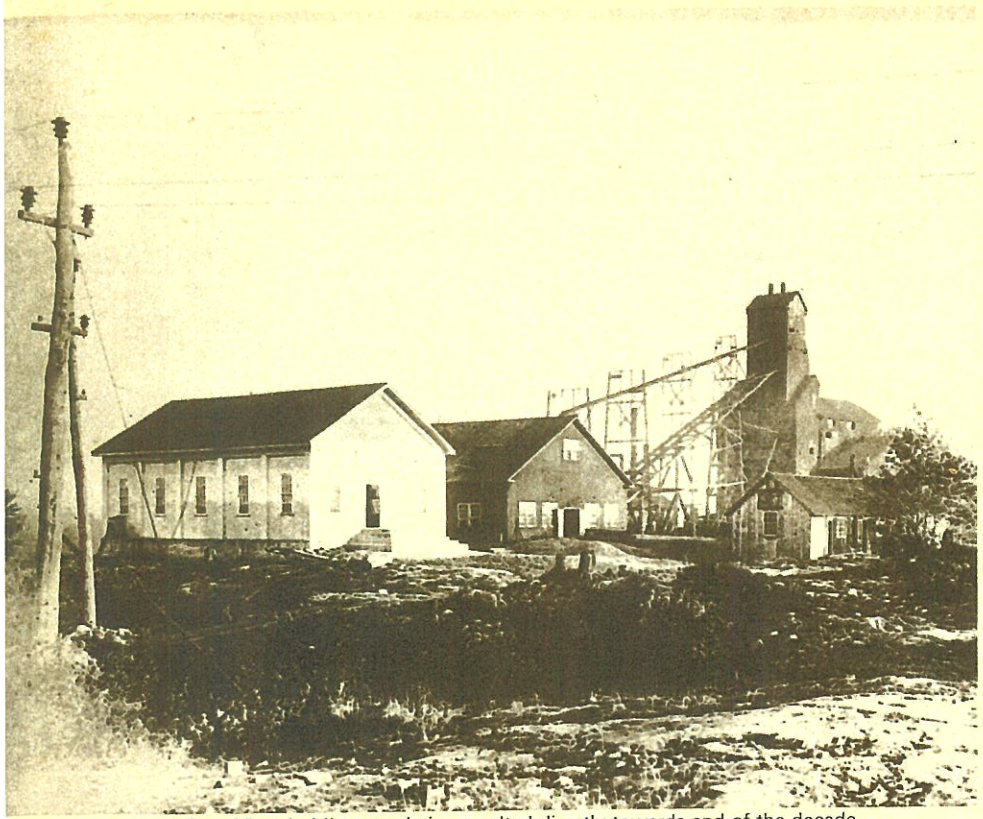
Early anti-pollution device, a baghouse to collect dust.



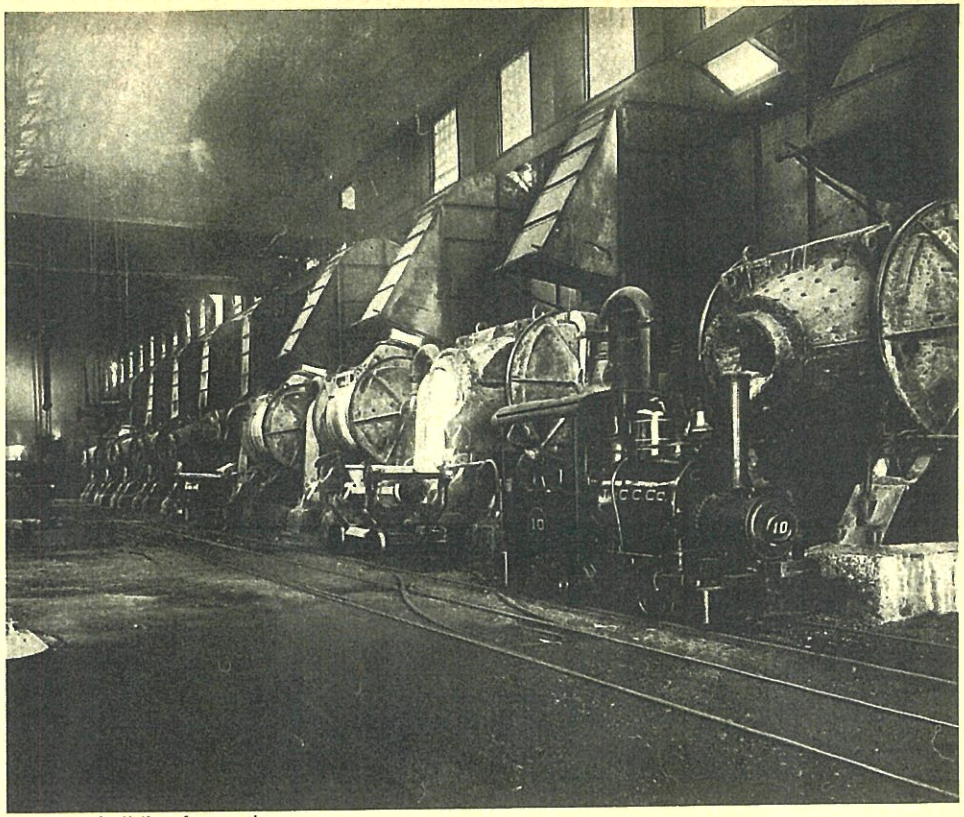
Roast yard east of Copper Cliff, about 1912.

General store was always warm and friendly.

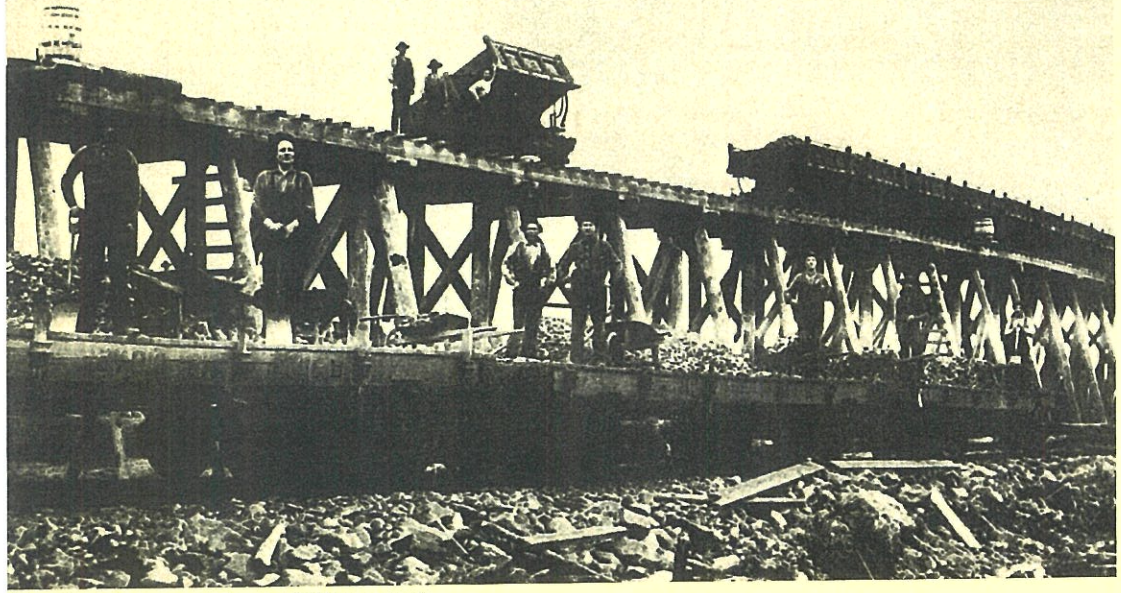
Home life centered around Victorian parlour.



Large portion of ore from Victoria Mine was being smelted directly towards end of the decade.



Converter building for treating ore.



Unloading green ore at Copper Cliff roast yard.

Fire wagon and volunteer brigade were prepared for all weather conditions.

1910

Mond Nickel Company started building the Coniston Smelter in 1910, about eight miles east of Sudbury. In 1913 the Victoria smelter was closed, and a new roasting yard was constructed near the new smelter at Coniston. Extensive development work was taking place throughout the district, and progress in the industry itself was marked by a series of metallurgical advances. But few innovations in smelting practices did anything to effectively limit pollution by sulphur dioxide.

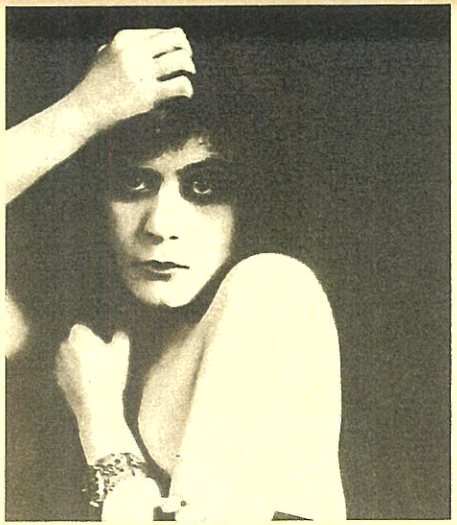
Even though the nickel industry was "at the ready" in terms of production capability, the outbreak of war in 1914 resulted in a large cutback in production, largely out of fear that Canadian nickel matte would find its way into enemy hands, since the United States, where most of the matte was refined, was still a neutral country.

This uneasy state of affairs precipitated the appointment in 1915 of the Royal Ontario Nickel Commission. Its findings, in turn, led to the incorporation in 1916 of The International Nickel Company of Canada, Limited under the Dominion Companies Act, and construction by the company of a refinery at Port Colborne, Ontario.

The new plant was impressive from an anti-pollution point of view, in that it went into operation in 1918 with two 350-foot smoke-stacks—among the tallest built at the time. Pollution control in the Sudbury District was also improved during this period; heap roasting was discontinued at Copper Cliff in 1916 and moved to a new roastyard at O'Donnel, well away from homes and gardens. In 1917, The British America Nickel Corporation announced plans for a new smelter near Murray Mine that would end the practice of heap roasting, leading the way for the eventual elimination of this land-ravaging practice in the following decade.

By 1918, there was no longer any fear of nickel falling into enemy hands, and war requirements called for capacity operation of the Sudbury District mines and smelters. The annual nickel output reached a new record of 46,000 tons. But the peak was short-lived; production was cut to one-third with the signing of the armistice in November of that year. Still, other developments were taking place in this new age of machines that gave promise of important new uses for nickel.

Acceptance of nickel by the automobile industry had come slowly, but it was to have a far greater economic impact than any armament race at any time in the history of the world. And little did Sudburians realize how great an impact aviation would have on the nickel industry, as they watched in awe when the first airplane to visit their community made 45 barnstorming flights in 1919.

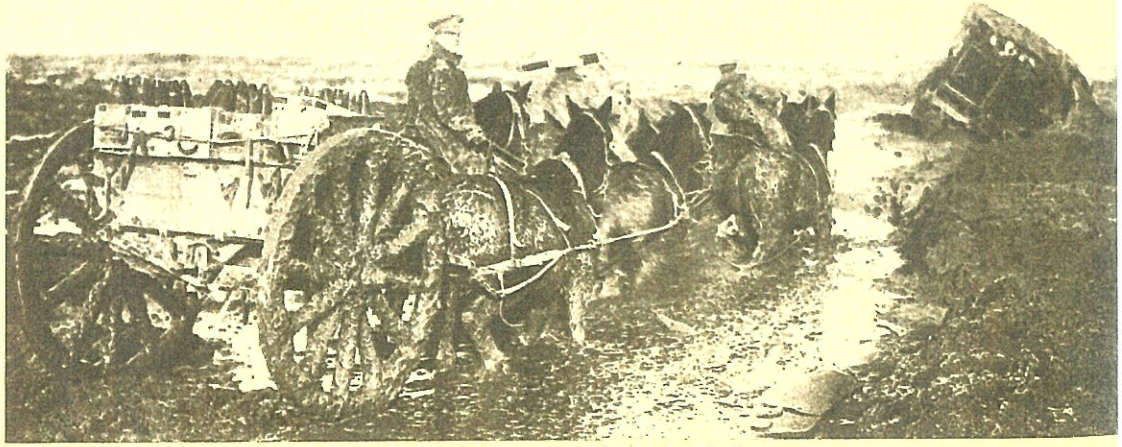


Theda Bara exemplified feminine mystique.

"Last one in's a . . . . . ."

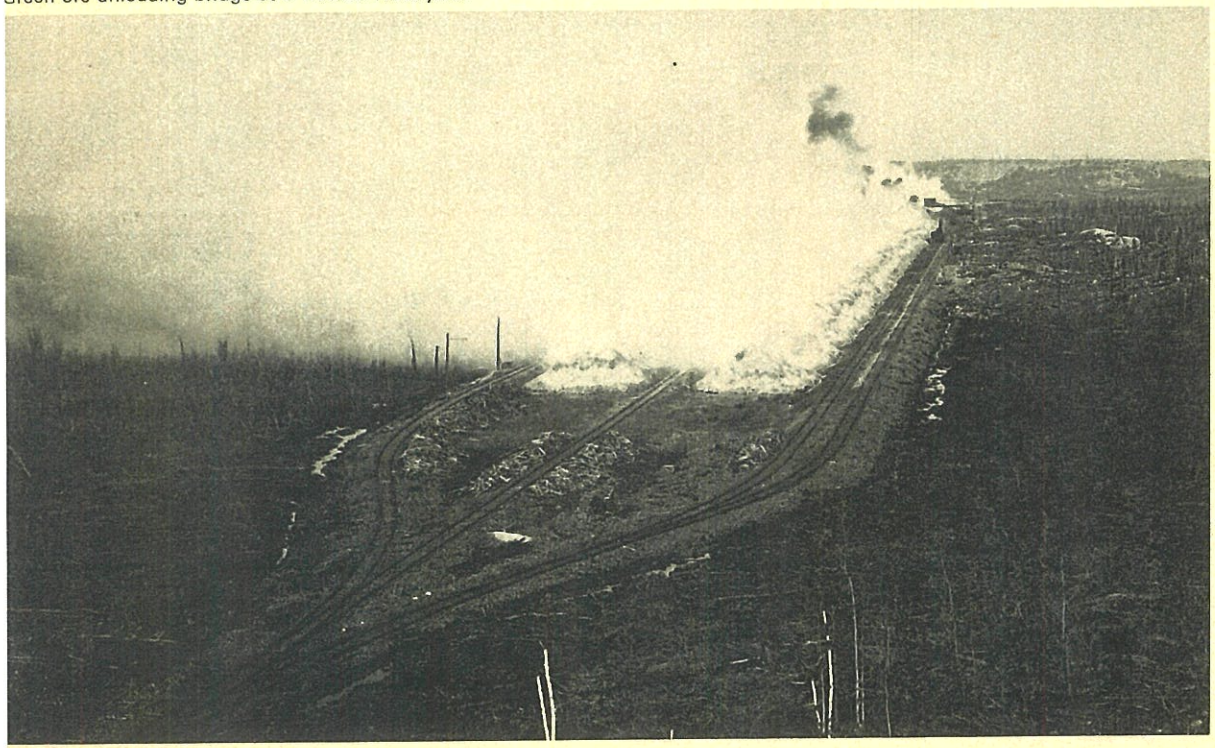
Remains of old British American Nickel Corporation smelter.

Daring Red Baron (right) and brother.

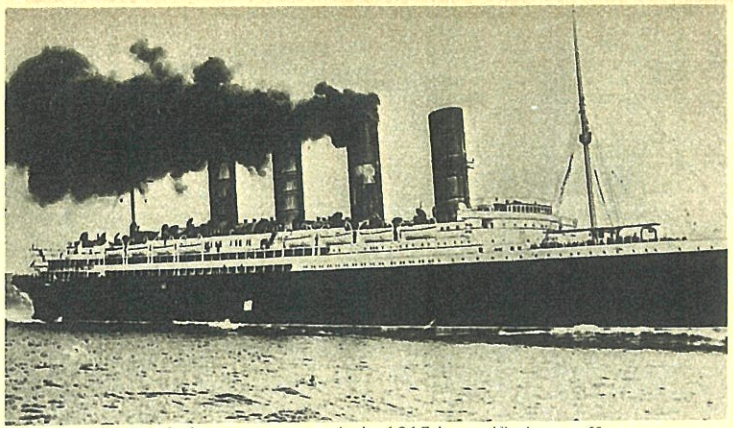


Horse was slowly giving way to new kind of horsepower as war dragged on in Europe.

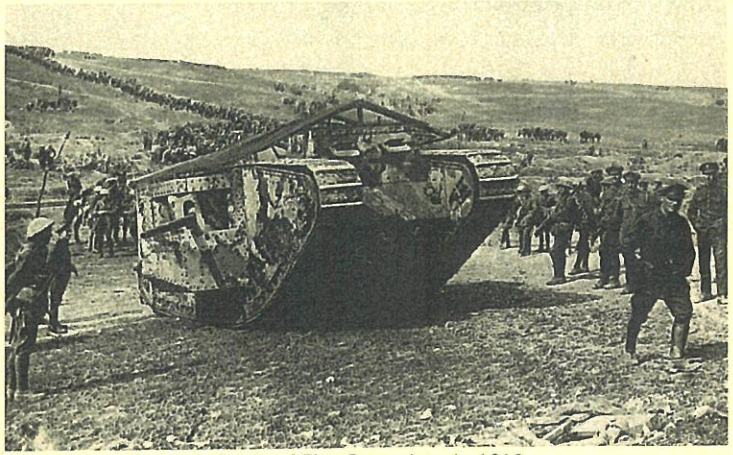
Green ore unloading bridge at O'Donnel roast yard.



Fumes from O'Donnel roast yard.



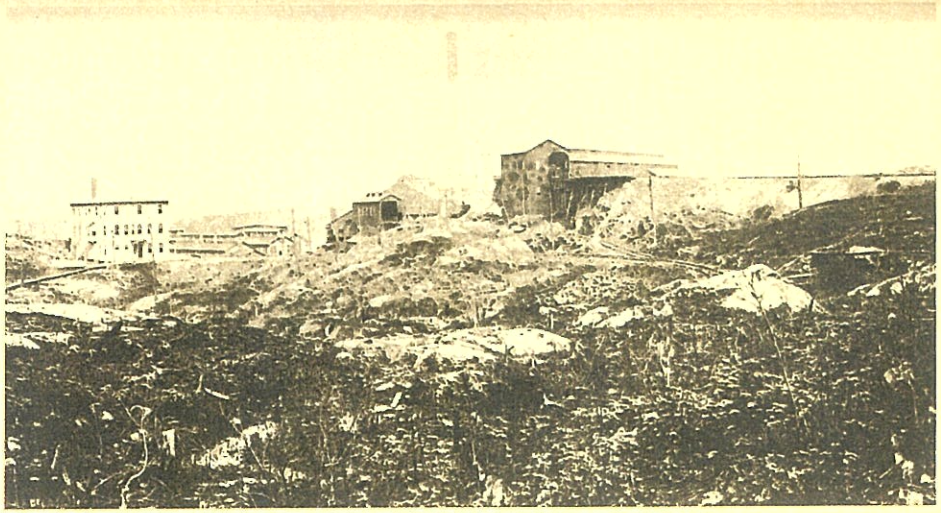
Sinking of Lusitania by enemy torpedo in 1915 intensified war effort.



Early tank, a Mark 1, in battle of Fler-Courcelette in 1916.

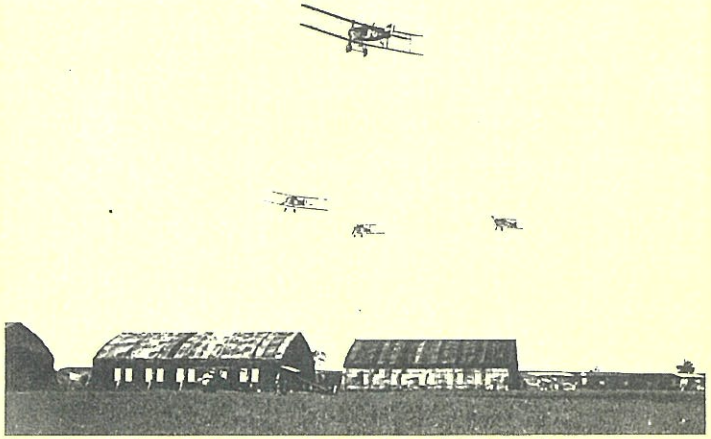
"Don't worry, dear, I'll have this thing fixed in a jiffy."

Dense bush would soon be cleared for Coniston smelter construction.

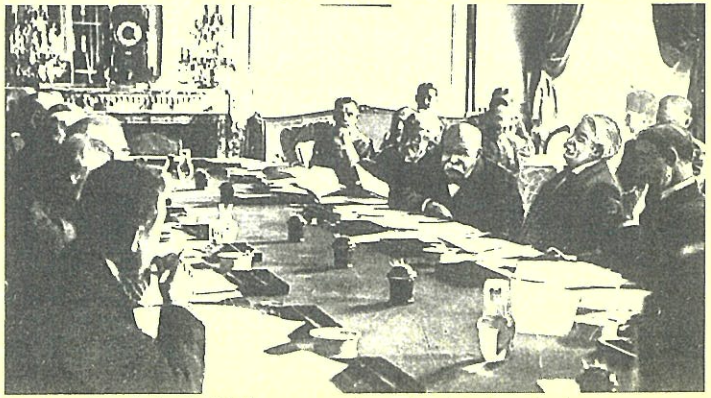


View of Coniston smelter, south end.

Damsel in distress was favourite movie plot.



Boom in aviation would have great impact on nickel industry.



Signing of armistice in 1918 meant cutbacks in nickel production.

1920

Those in-the-know had complete faith in the future of nickel, but the immediate postwar period was somewhat discouraging. Sales lagged badly and production was cut. The industry, with Inco of Canada in the lead, had to find and develop new markets and forget about simply supplying nickel for war material. And that's when the age of nickel alloys really began.

In 1921, British American Nickel Corporation closed its mining, smelting and refining operations, leaving the field to Inco and Mond. In 1929, these two companies became one enterprise under the Inco banner. The joining of the nickel giants meant a combining of talents, which in turn resulted in new markets for nickel, widening of existing markets, conservation of the resource, stabilization of employment, higher wages and strengthening of the national economy.

Construction of the new reduction plant at Copper Cliff was started in 1928, and foundations for the Copper Cliff mill and smelter were completed in the spring of 1929 – part of a major construction program involving mines, smelters, refineries, power plants and miscellaneous facilities.

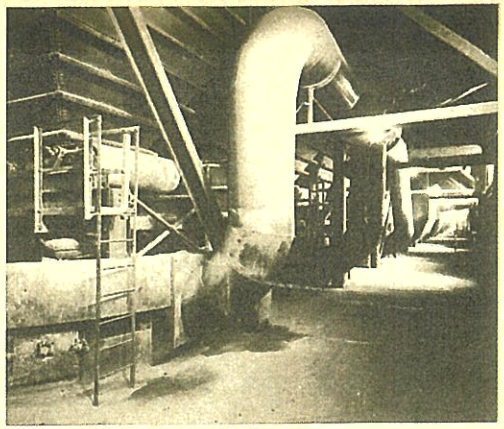
But not all effort was directed towards production; strong emphasis on pollution control was also a key consideration. In 1929, Inco installed the first sewage treatment plant in Canada. The installation of roaster furnaces ended for all time the practice of open heap roasting. Gas from the new smelter was to be dispersed from a 510-foot stack, the tallest in the British Empire. Sulphur dioxide emissions were to be reduced by converting some of the off-gas to sulphuric acid in a plant operated by Canadian Industries Limited adjacent to the smelter. It was brought into operation the following year.

Construction of the copper refinery at Copper Cliff was commenced in 1929. It was to be operated by a new firm, the Ontario Refining Company, later to be taken over by Inco. And at Coniston, a new 175-foot stack was built to serve that smelter.

In all new undertakings there was a happy combination of production expansion, resource conservation and pollution abatement. The finest technology of the day was put to work in all phases of the operations. There were shortcomings by today's standards, but the company laid a solid foundation on which to build improvements as technology improved.

This decade also saw another potentially important mining venture enter the Sudbury Basin – Falconbridge Nickel Mines Limited, organized in 1928 to work an excellent nickel-copper deposit in Falconbridge township.

Hollywood sweetheart, Clara Bow.

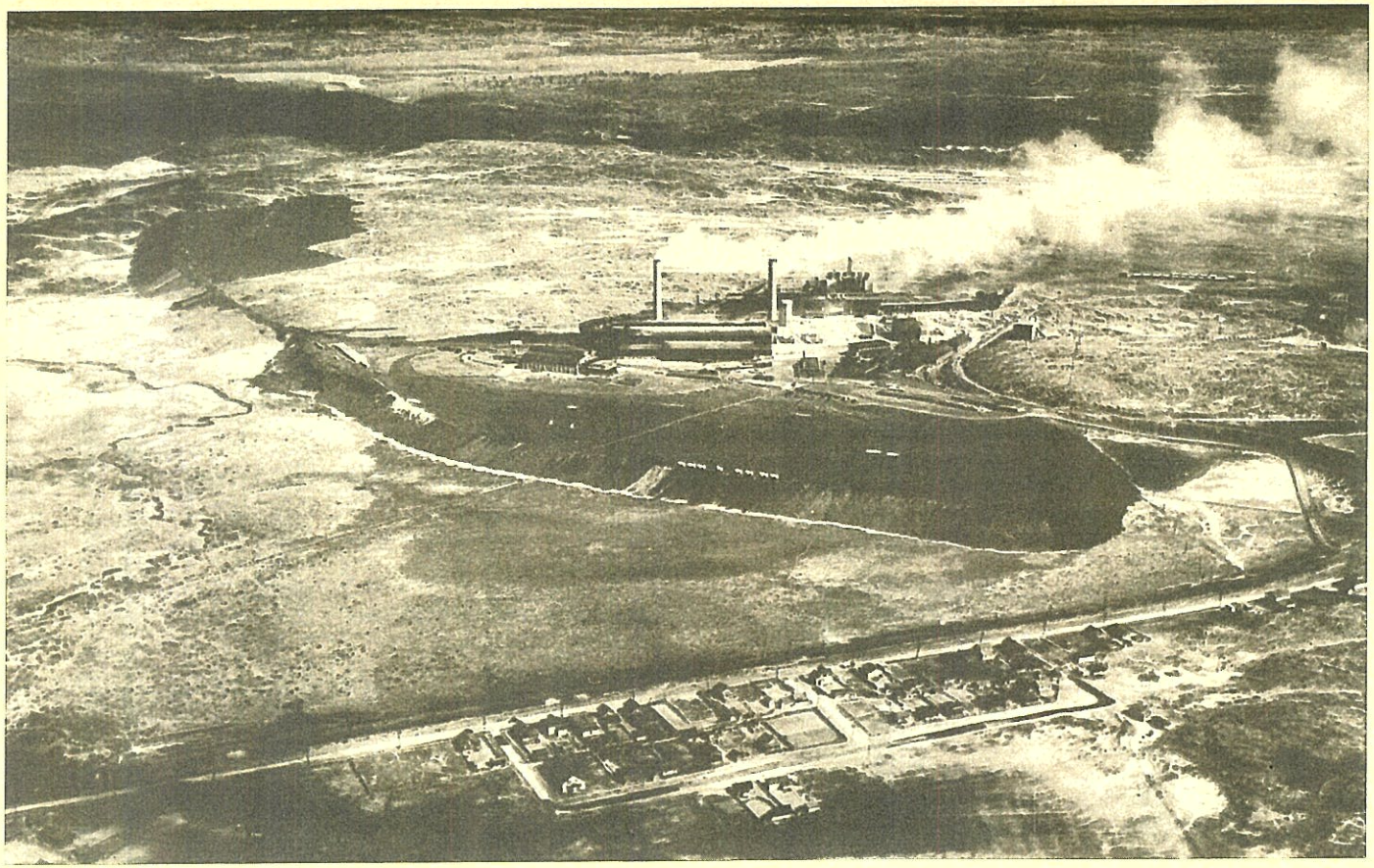


Roaster aisle at Copper Cliff smelter.

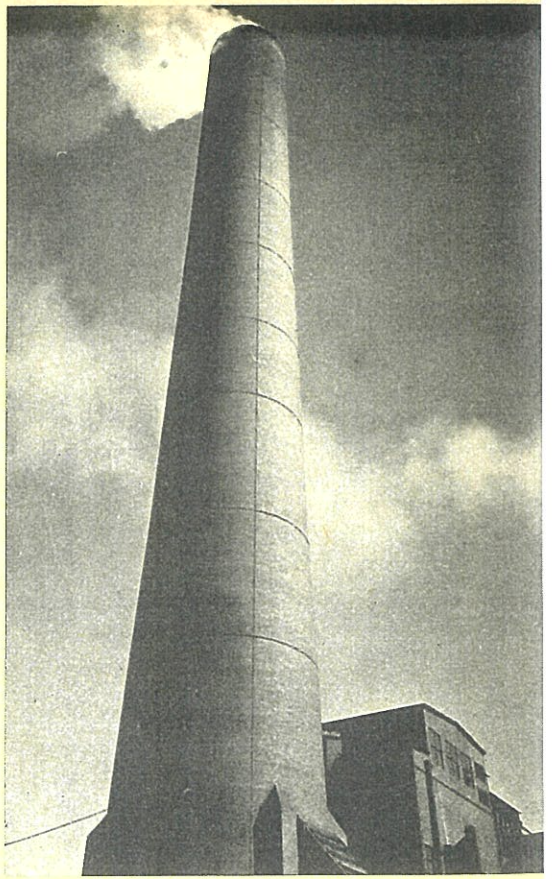
Looking up Durham Street. Sudbury was booming along with expansion of nickel industry.

"Watch the birdie."

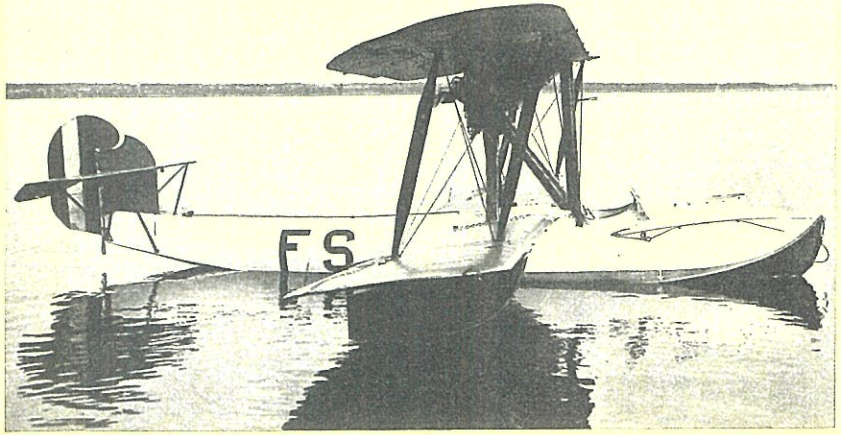
The automobile had come of age.



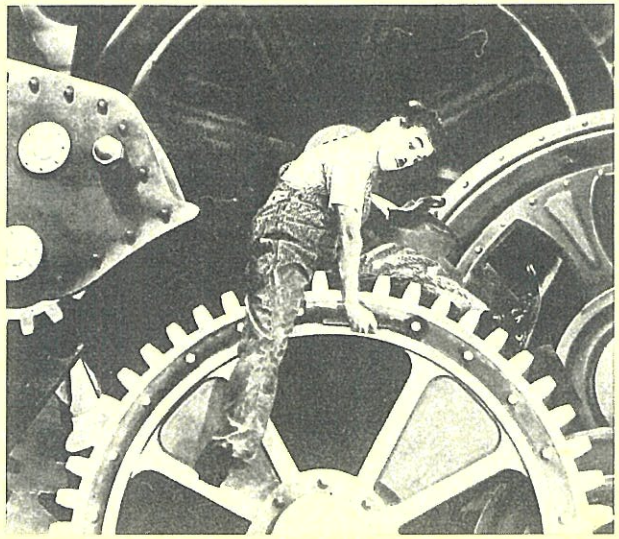
Coniston smelter, 1928.



Just completed 510-foot Copper Cliff smelter stack.



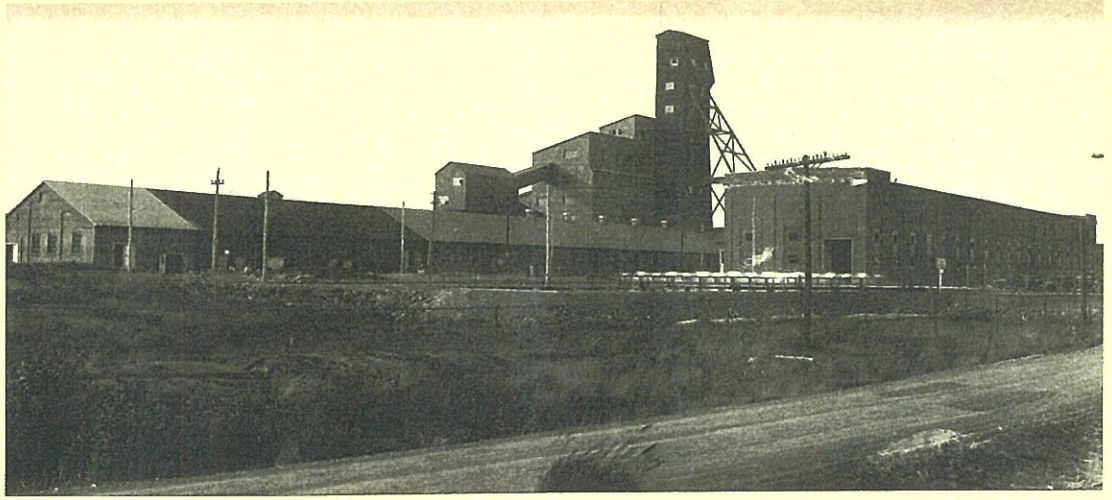
Vickers "Vedette" was first aircraft wholly designed and built in Canada.



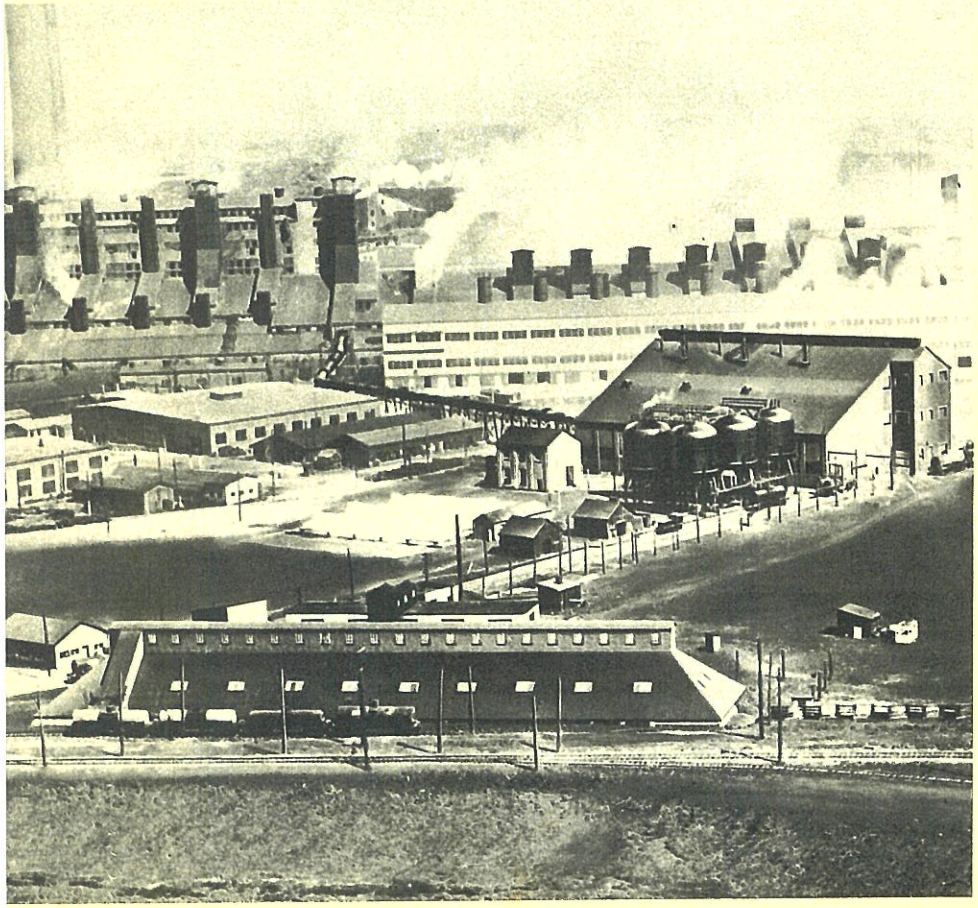
Cogs of industry even baffled unflapable Charlie Chaplin.

"My little chickadee."

The automobile became synonymous with leisure.



Frood mine surface buildings, 1929.



First acid facility at Copper Cliff smelter, just before it went into operation.

Copper Cliff, including part of park.

1930

The nineteen-thirties were years of depression and dissention throughout the world. But despite the fact that the nickel industry suffered in the early part of the decade when the metals market was sorely deflated, there was never a feeling of hopelessness – neither in the industry nor the town – that prevailed in many other communities.

On August 4, 1930, Sudbury was officially raised in status from town to city, with a population of just over 20,000. There were jobs in the new giant smelter, and Inco and Ontario Refining Co. were proceeding with their $50,000,000 program of construction. Falconbridge and the C.P.R. were also building facilities, and local improvement work – a program partly financed by the province – took up most of the unemployment slack. The Trans-Canada highway in the district was part of the project.

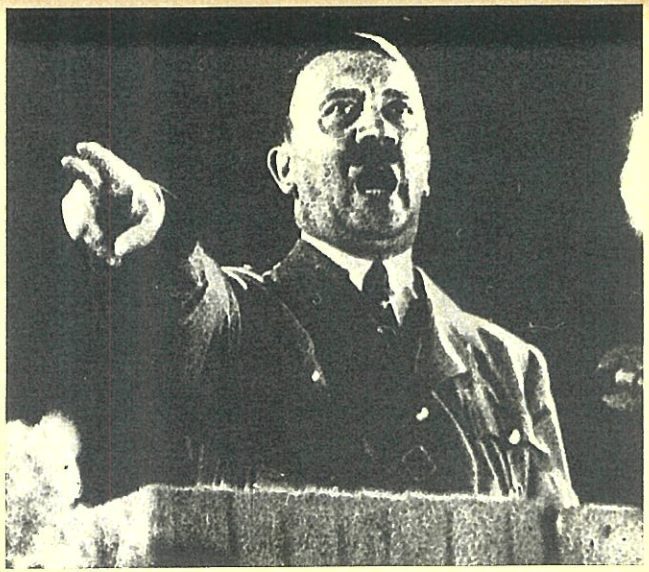
In 1932, Sudbury seemed to be the most joyful town on the face of the earth after the Wolves, under Maxie Silverman's management, won the Memorial Cup, emblematic of junior hockey supremacy in Canada. And if that wasn't enough to put Sudbury on the sports map for all time, a local lad, David Komonen, made doubly-sure by winning the Boston 26-mile marathon in 1934.

In the industry, the market quickly improved, and in 1935 Inco's sales of nickel, copper and platinum metals were higher than in any previous year. The Copper Cliff and Coniston smelters were operating full blast. Falconbridge was also pushed to meet demand and had to expand smelter capacity. In 1936, with completion of the Inco expansion program, the Copper Cliff mill-smelter capacity was at a new high of 11,000 tons per day.

But not everything was "coming up roses". Expansion and increased production meant more sulphur dioxide and dust in the community atmosphere and continuing damage to vegetation. Part of the problem was solved in 1936 with the erection of another tall chimney at Copper Cliff – 500 feet – to serve the copper section of the smelter. In 1937, a new research laboratory was built at Copper Cliff. Its first project was to improve the recovery of metals, in itself an anti-pollution measure because higher recovery means less loss to fume and tailings.

The downward trend in world trading finally caught up with the nickel industry again in 1938, and there was a slight curtailment in operations in the Sudbury Basin. But the following year, as another war dawned, production soared despite some revival of old fears that Canadian nickel would end up in enemy armaments – and further expansion of the Copper Cliff smelter was necessary to meet production requirements.

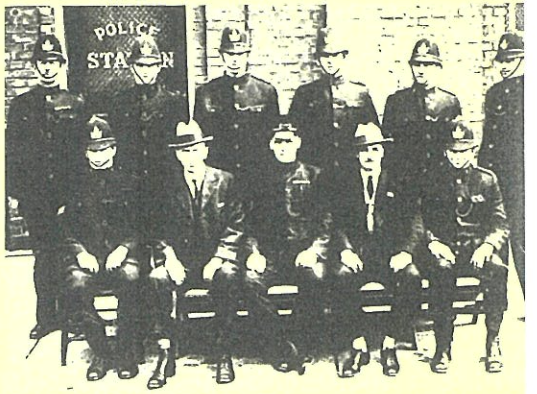
The pending global war hastened a North American visit by King George VI and his Queen to show the world that an Atlantic alliance was not impossible. Sudbury was an important stop; the Monarchs – and the world – would become aware of the vast resources of the Canadian nickel mining industry.



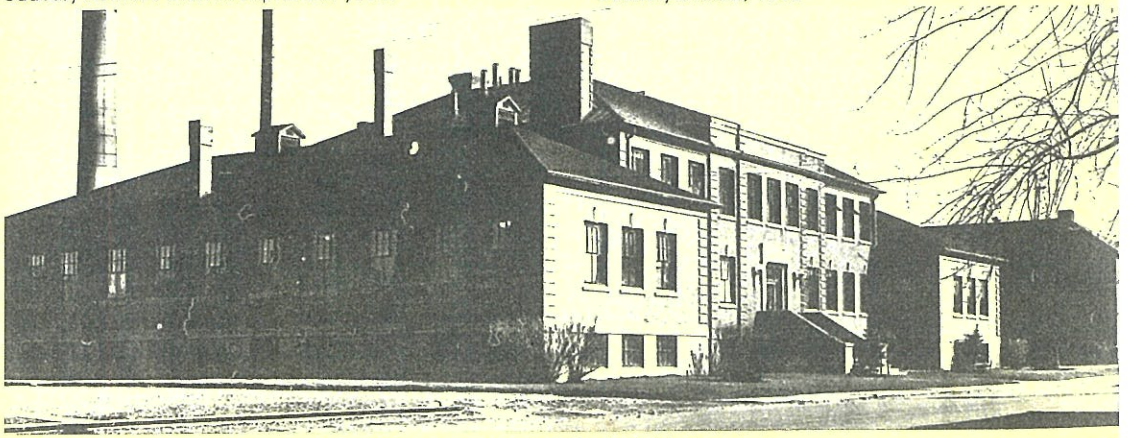
Sowing seeds of war.

"All right, sweetheart".

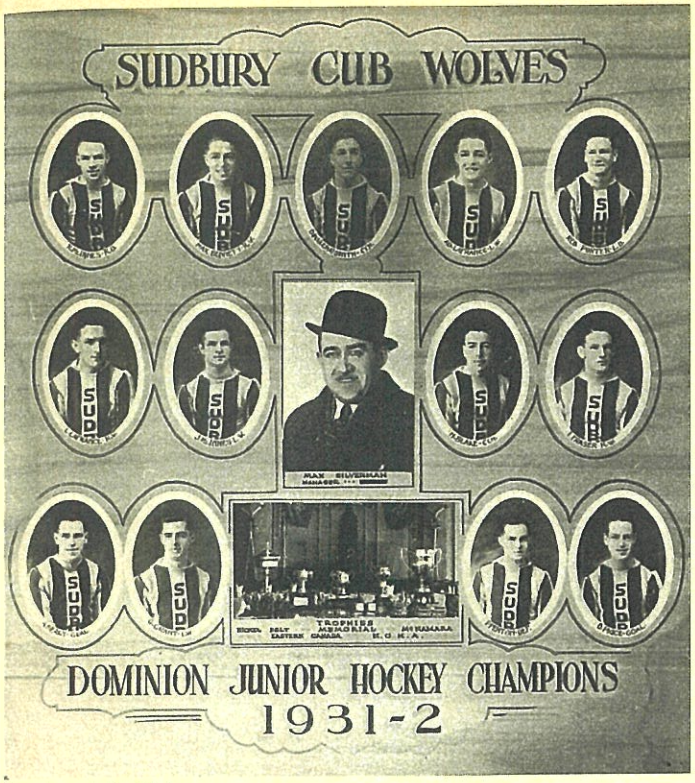
Sudbury boomed even in depression years.



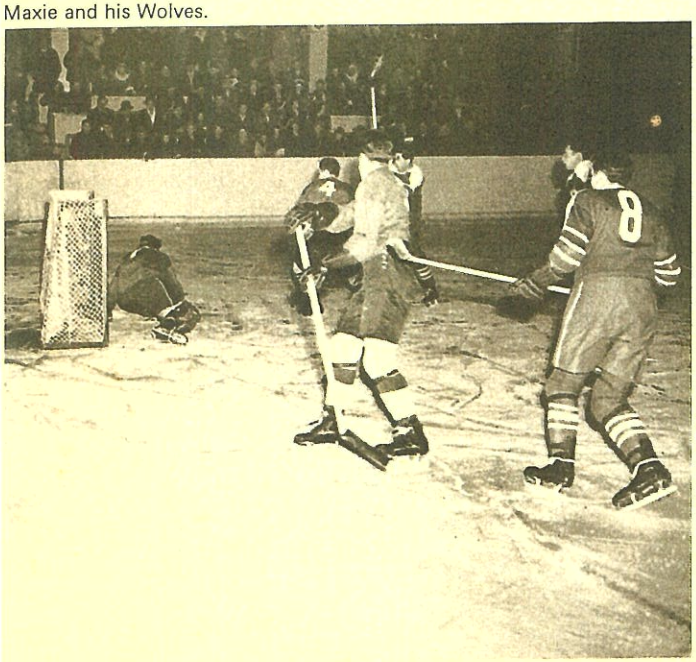
Sudbury's finest, 1932



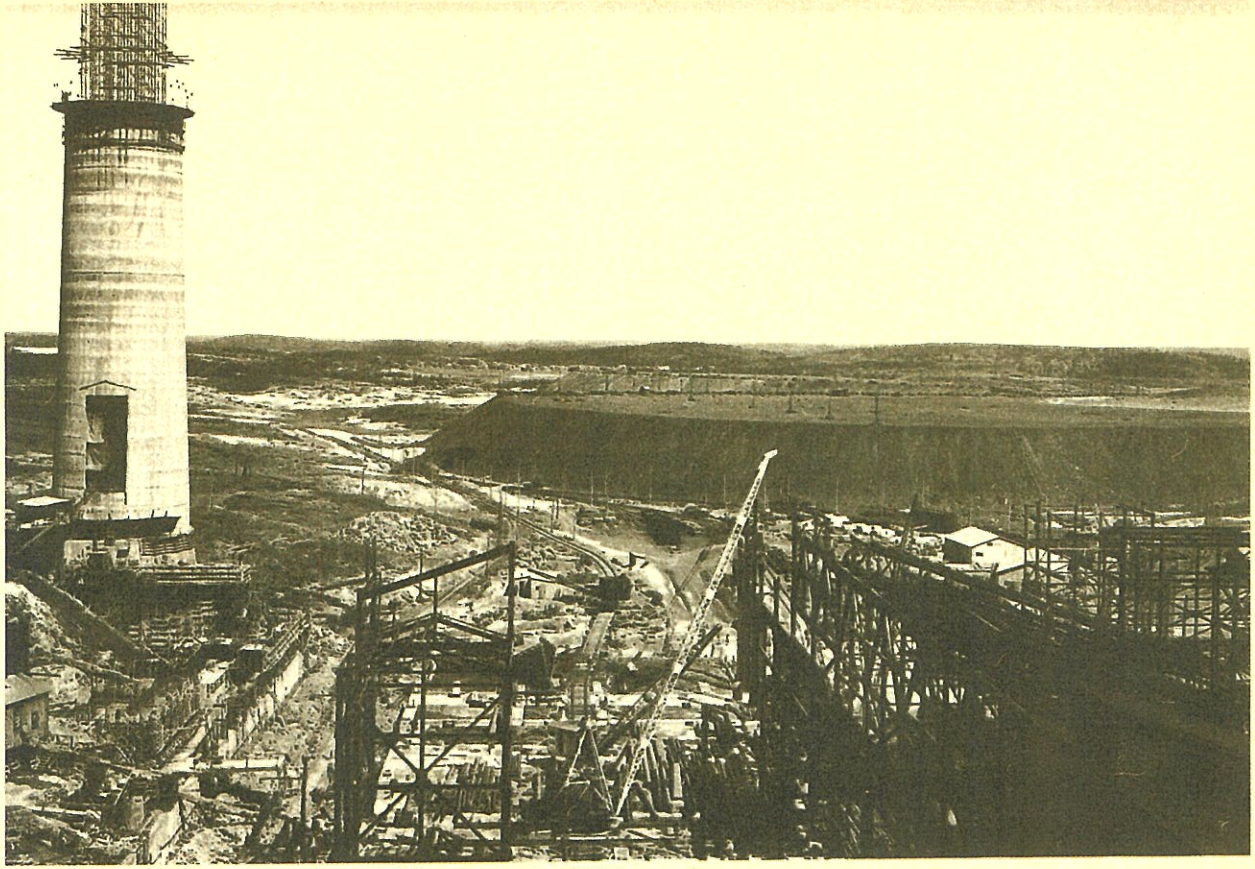
Copper Cliff laboratory, built in 1937, emphasized Inco's activities in field of research.



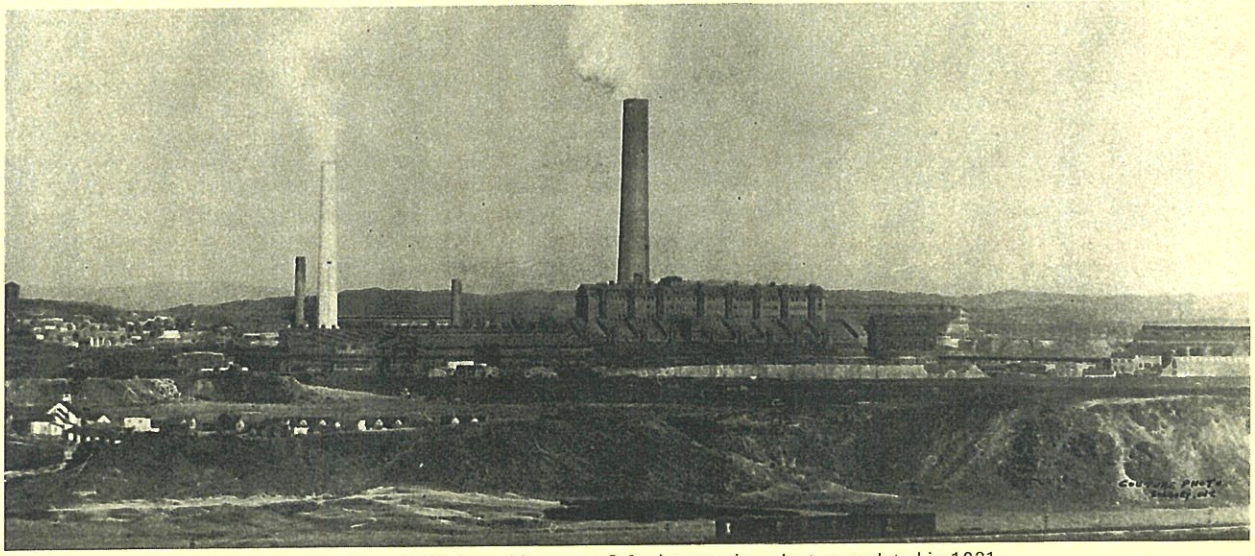
Maxie and his Wolves.



Sudbury had become sports-minded city.



New stack under construction at Copper Cliff smelter reaches 200-foot mark.



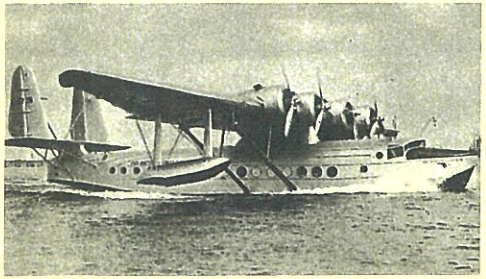
Expansion program included construction of 350-foot chimney at Orford separation plant, completed in 1931.

King George VI and his Queen visited city in 1939.

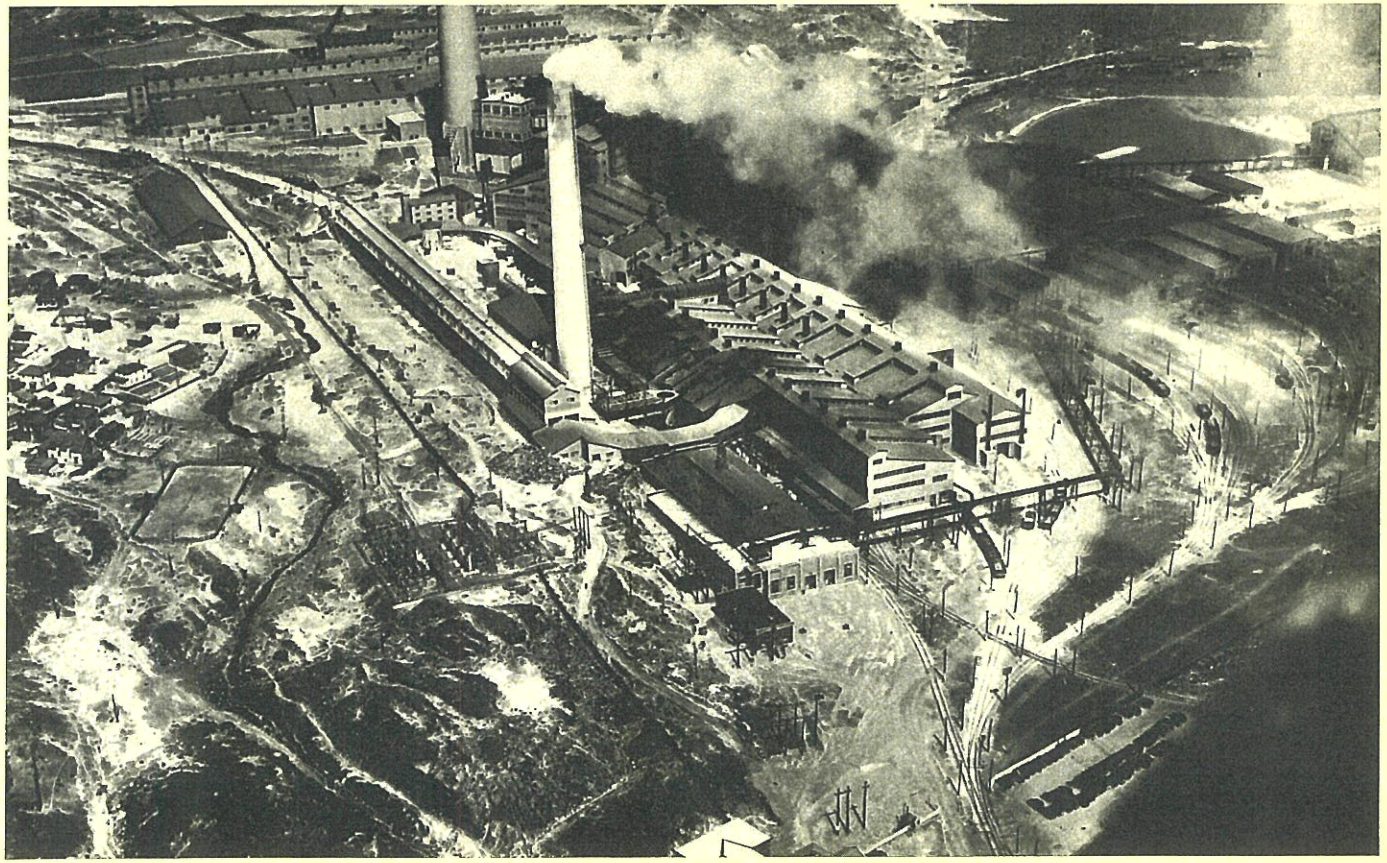
Autos became sleeker, sportier.

Street car was familiar scene in Sudbury in '30s.

Queen was first woman to go underground in Sudbury.



"Clipper III" set new standard in oceanic travel.



Copper Cliff smelter, 1936, at completion of Inco expansion program.

1940

Supplying nickel, copper and platinum metals to the defense industries of Canada, Great Britain and the United States during the period 1939 to 1945 doubled the output of Inco ores. Peak production was in 1941, and nickel mined throughout the war equalled the total of the previous 54 years.

Plant additions and revisions were needed to meet the demand, and the main thrust of Inco's effort went into expanding capacity and preventing bottlenecks due to the increased throughput. As a result, there were a number of important technological advances in certain areas of operation. Pollution control was forced to take a back seat during this crucial period of expansion, although some improvements were made, such as increased dust collection efficiency.

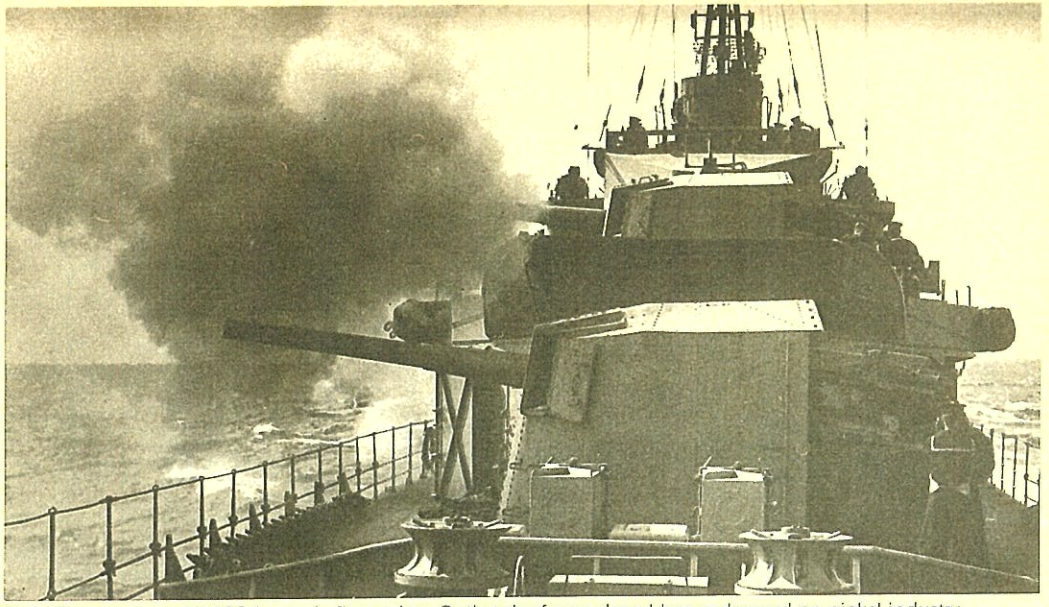
During the first half of the decade, the war effort occupied the minds of men full time. And of women, too. Because of a labor shortage, women were employed in almost all plant surface areas. However, the shortage of manpower never became critical; the call up of men between 19 and 35 for active service did not affect Sudbury and Copper Cliff as much as might have been expected, because jobs in mining were considered vital to the war effort. Nevertheless, by 1942 1,500 homes in Sudbury had men in the armed forces.

Shortages, rationing, new taxes, the Victory Bond Drive and "Milk for Britain" were taken in stride by the people of the Nickel Belt, who probably felt closer to the war effort than most other Canadians who could not actually go and fight.

The citizens also held visions of a better, brighter community to help sustain them through the war. A ten-year expansion program drafted by Sudbury council in 1943 included an airport, an artificial ice rink, a University of Northern Ontario, a permanent highway from Toronto to Timmins passing through Sudbury, housing and extensive municipal works. And after the war, in 1947, Inco started a million dollar building program in Copper Cliff that included homes, streets and enlargement of the school. At the plant, the old Orford process was superseded by a new slow cooling method of separating the metals in the ore.

Still, there was a feeling that a community of Sudbury's size and importance lacked certain aesthetical features that were common to most other comparable communities. After the war, for example, Inco was spending $50,000 a year on smoke damage claims alone. But during the years when Europe and the Far East were being ravaged by war, Inco researchers were quietly investigating possible means of reclaiming lands that had been ravaged by pollution and erosion.

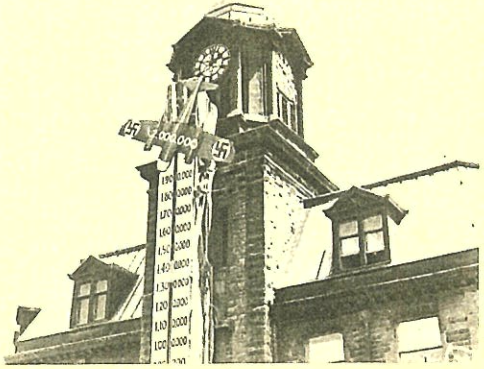
Sudbury had long since become much more than a mining town; it had become a diversified community that was "home" for many people from many lands. Some began to hope that the denuded, eroded land in the district could be retrieved. But land reclamation was still a new science, and it would be many years before any real progress would be achieved.



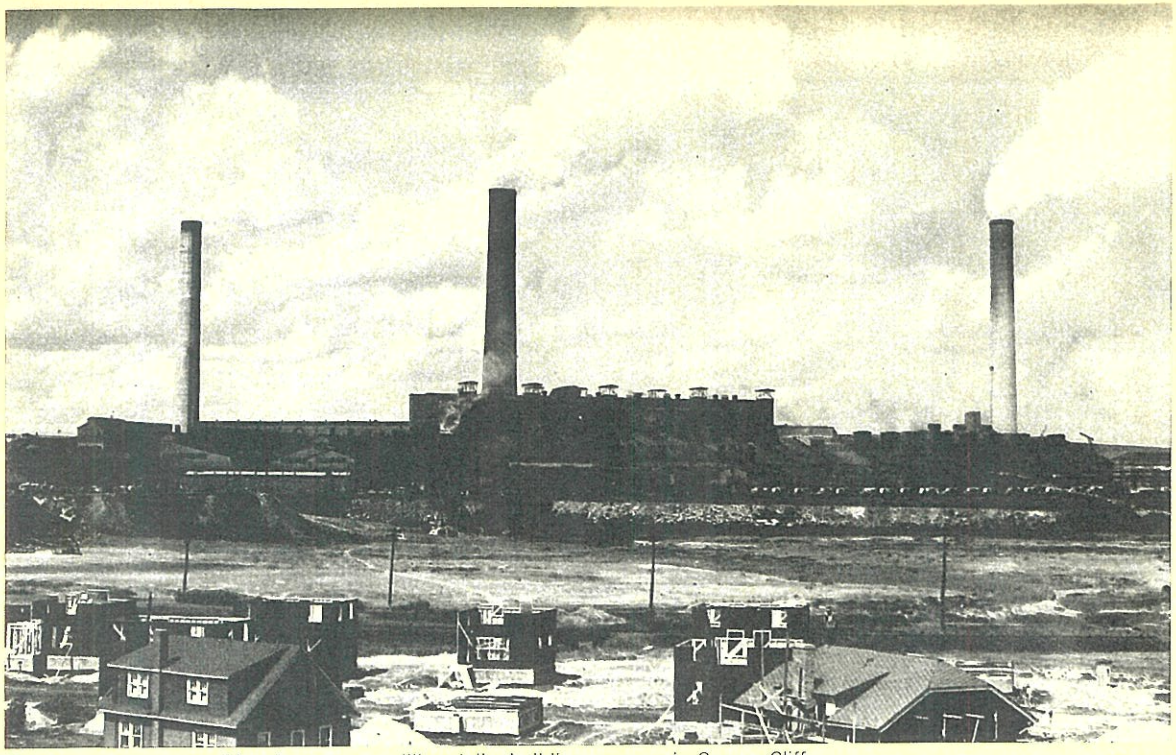
Canadian destroyer HMCS Iroquois fires salvo. Outbreak of war placed heavy demand on nickel industry.

Frood open pit, key source of nickel.

Canadian soldiers on European front.

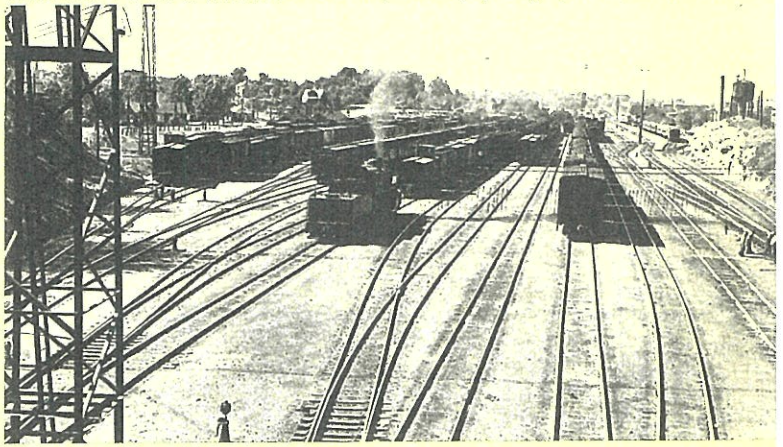


Sudbury Victory Bond "crash" campaign.

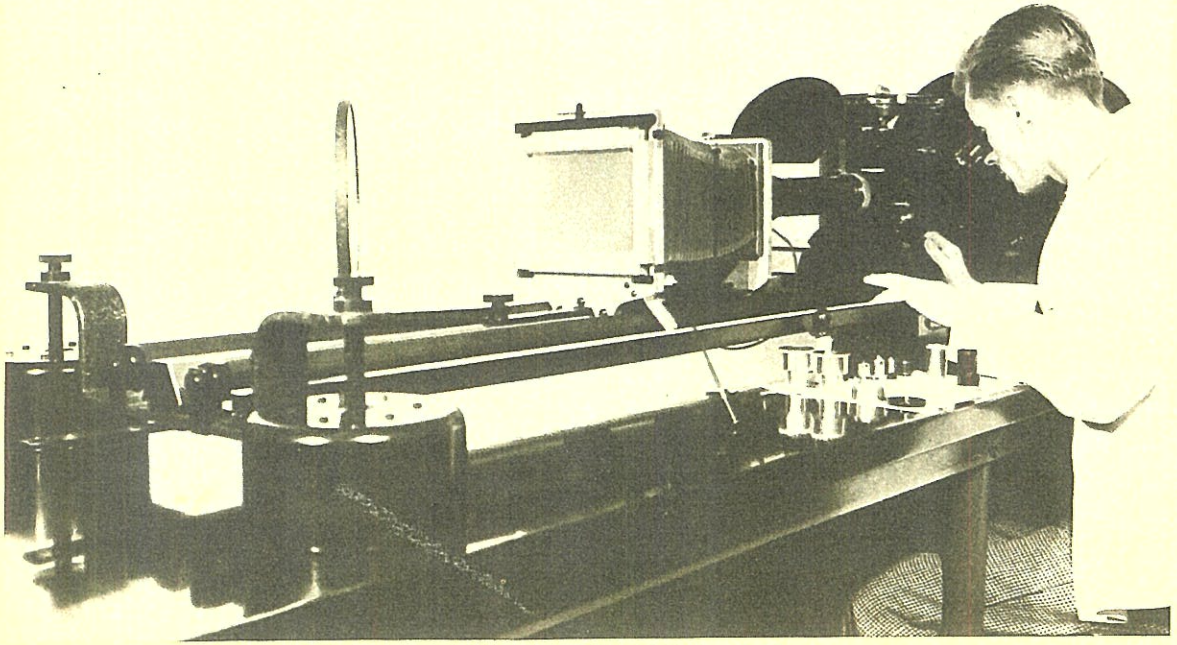


New homes were part of Inco's post-war million dollar building program in Copper Cliff.

World War 1 ace, Air Marshal W. A. "Billy" Bishop (far right) with young airmen.

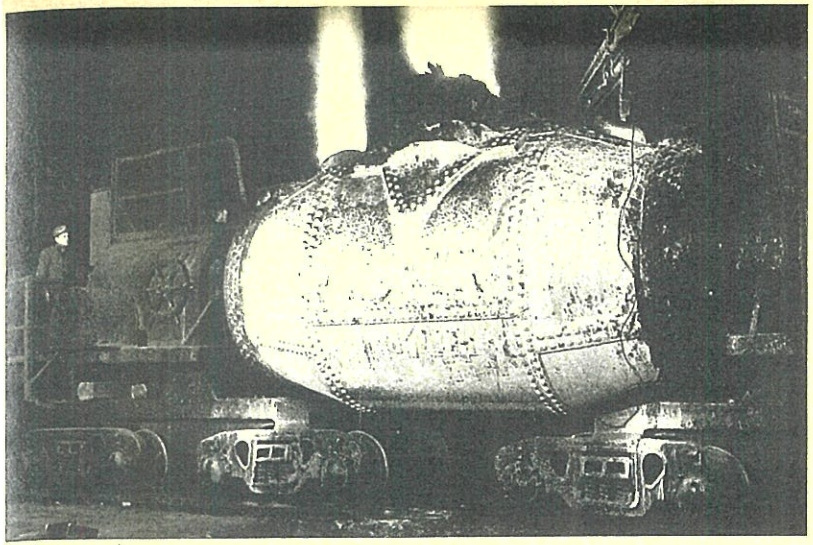


Sudbury freight yards were kept busy in war years



Researchers at Copper Cliff laboratory were investigating ways of reclaiming eroded land.

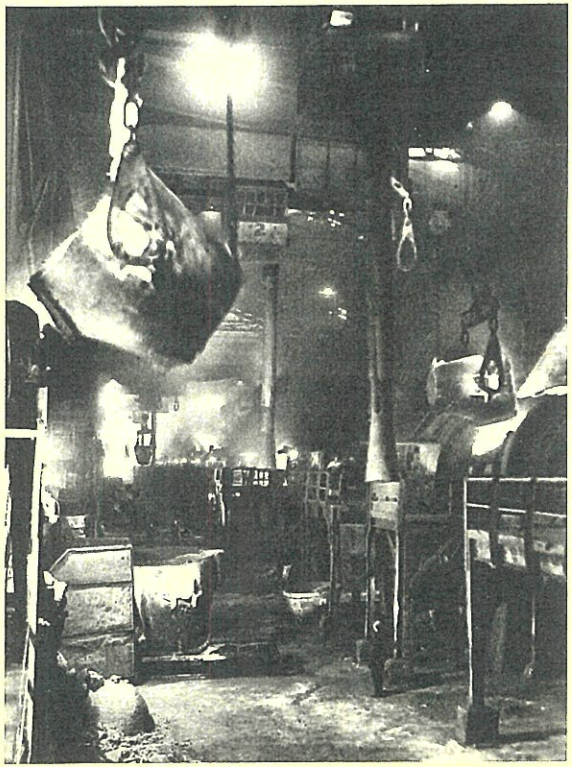
Women contributed to war effort by filling jobs in plant surface areas.



Molten metal car.

German surrender in Rheims, France, schoolroom and Japanese surrender in Tokyo Bay in 1945 signaled new hope for world and new priorities for industry.

First Inco Quarter Century Club meeting, Sudbury, 1948. Men with 25 years' service had seen great strides in nickel industry.



Smelter converter aisle during peak production period.

"Big Three" confer at Casablanca, North Africa, 1943.

Victory march through Sudbury.

1950

As the fifties got underway, the demand for nickel – now mainly for non-military uses – still exceeded the available supply, despite capacity operation of mines and reduction plants. Inco was replacing the productive capacity of nearly depleted open pits, except Frood pit, with a multi-million dollar underground mine expansion program. Exploration and development of marginal nickel deposits was stimulated to meet the unsatiated demand for nickel, and surface plant expansion was needed to keep pace.

Various companies made important starts in developing methods of treating sulphide ores that would not require smelting and the consequential emission to the atmosphere of large amounts of sulphur dioxide. There were limited successes – such as Sherritt Gordon's leaching process for its Lynn Lake, Manitoba ores. In other locations, such as the Sudbury Basin, ores were not amenable to similar methods of treatment. But at least this one success offered hope that intensive research might unveil other workable methods.

Meanwhile, research began at the Mines Branch, Ottawa, in 1951 to explore the possibility of obtaining elemental sulphur from sulphide minerals.

In 1952, manufacture of liquid sulphur dioxide began on the Inco site – made possible by Inco's new flash-smelting process which produced a gas containing a higher sulphur dioxide content. Sulphuric acid operations were expanded in 1957, resulting in still further recovery of sulphur values from smelter gas.

The Company's emphasis on metallurgical research and pollution control culminated in completion of a new research laboratory at Port Colborne to permit more extensive study of refining procedures.

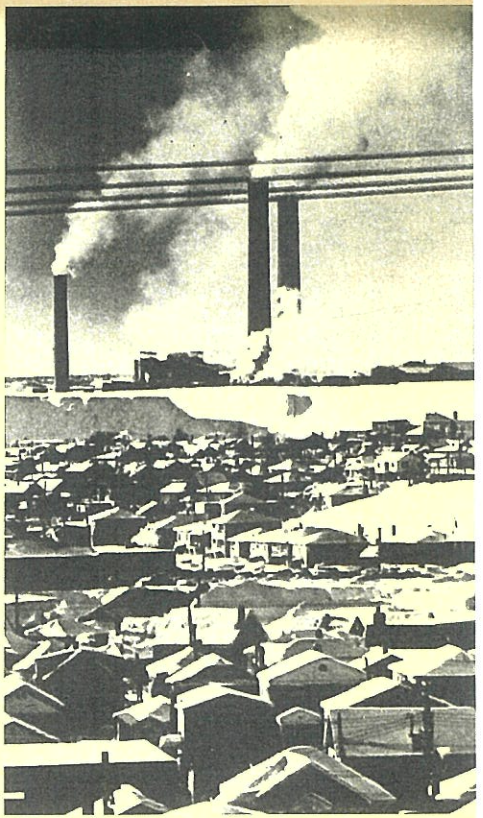
Overseas, at the Company's refinery in Clydach, Wales, the treatment of residues by the Orford process – on which the Canadian nickel industry was founded some 60 years previous – was discontinued and superseded by a new hydrometallurgical process.

Here at home, two small stacks at the Coniston smelter were replaced in 1954 by a new 400-foot chimney to provide more effective diffusion of smelter gas. In the same year, the tallest chimney in the world to date – rising 637 feet above ground level – was completed at Inco's Copper Cliff iron ore recovery plant, which started commercial operations in 1956.

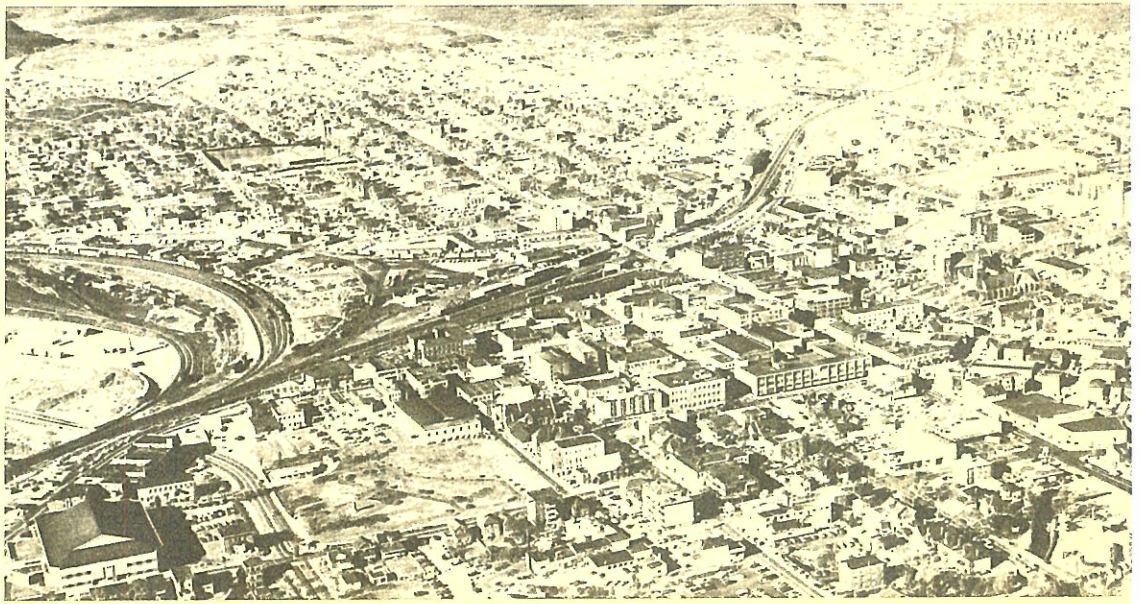
In industry, as in all endeavours, the fifties were years of innovations and achievements. Life styles and ideas changed quickly. Such new departures as television – CKSO-TV in Sudbury was the first privately owned television station in Canada – broadened peoples' horizons and brought the world within reach of everyman.

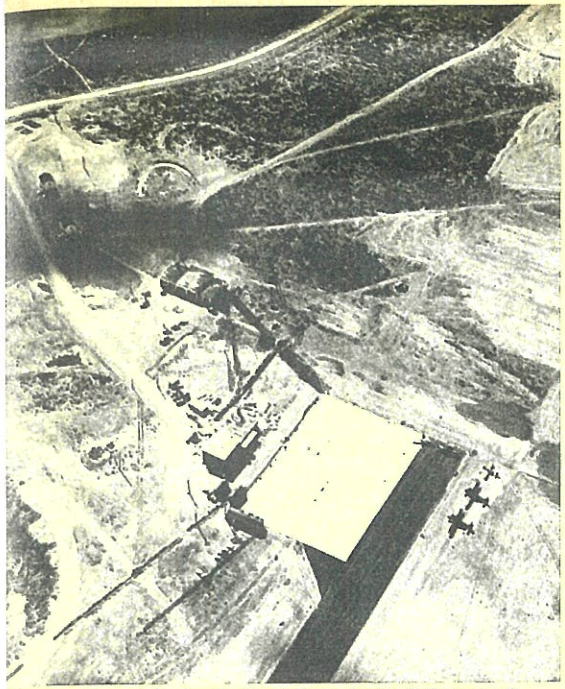
The decade ended on a particularly happy note for Sudburians when, in the summer of 1959, Queen Elizabeth II became the second woman to go underground in the District mines, following a precedent set by Queen Mother Elizabeth 20 years earlier.

Air travel had become relatively sophisticated by the '50s.

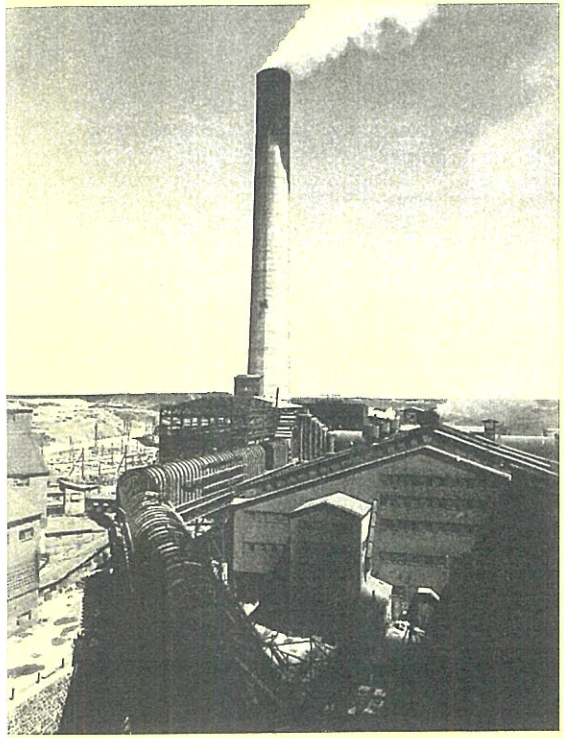

Winter in Copper Cliff.


Downtown Sudbury was hub of activity in frantic fifties.

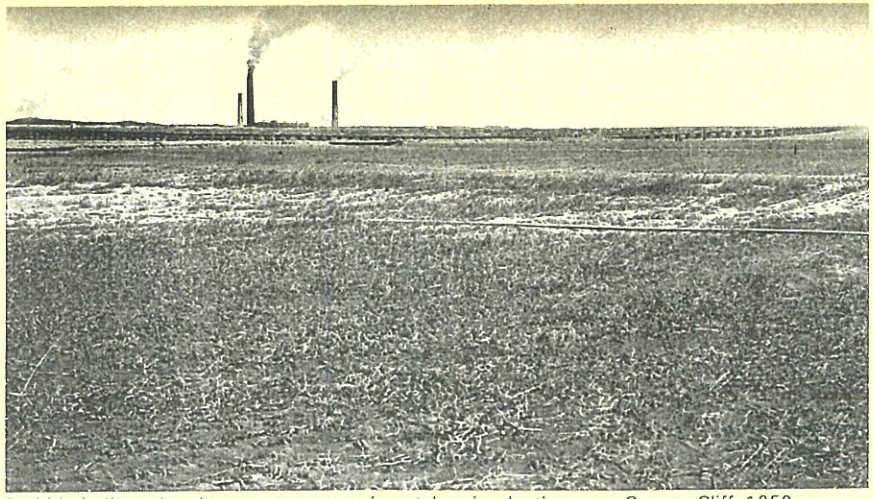

Sudbury was growing all the time.



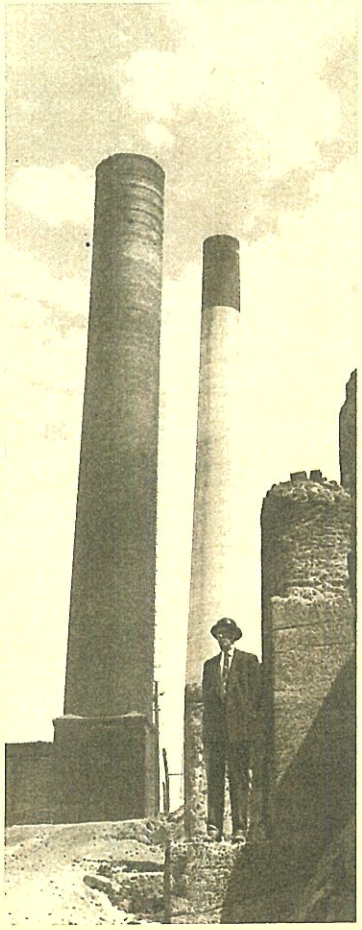
Construction of Sudbury airport forged new link to south.



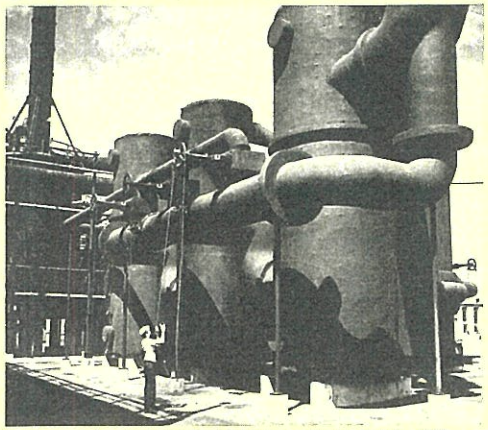
Flue installation was part of pollution abatement program.



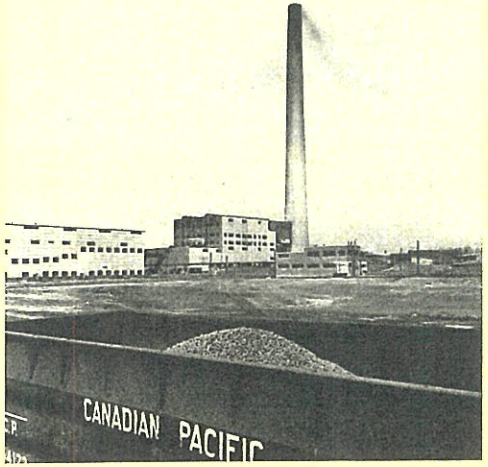
Stubble indicated early attempt at experimental grain planting near Copper Cliff, '959.



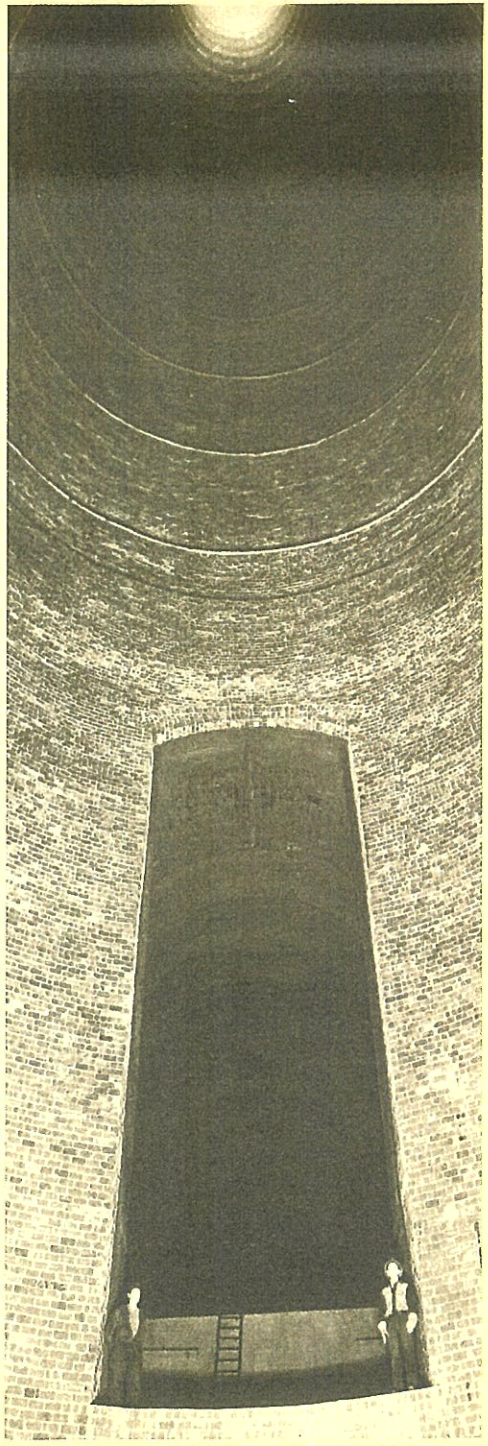
New 400-foot Coniston smelter stack.



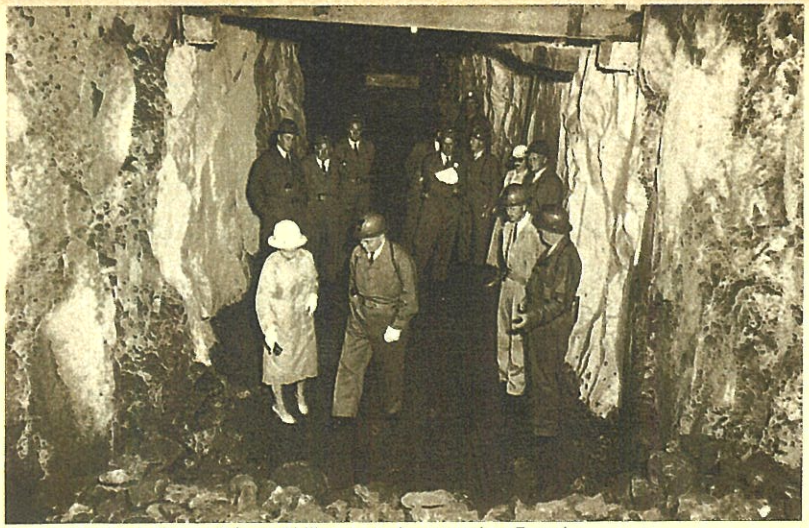
C.I.L. sulphuric acid facility was expanded in '57.



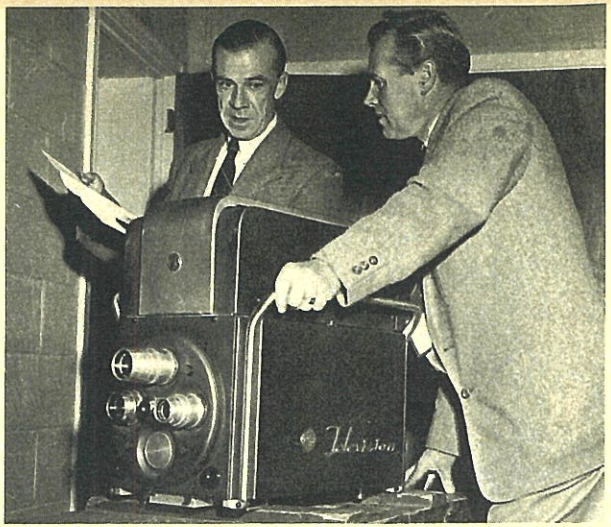
First shipment of iron ore pellets from new plant.



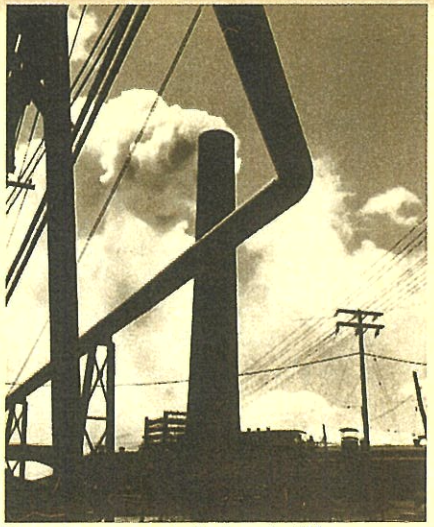
Inside just-completed 637-foot iron ore chimney.



Queen Elizabeth II and Prince Philip go underground at Frood.

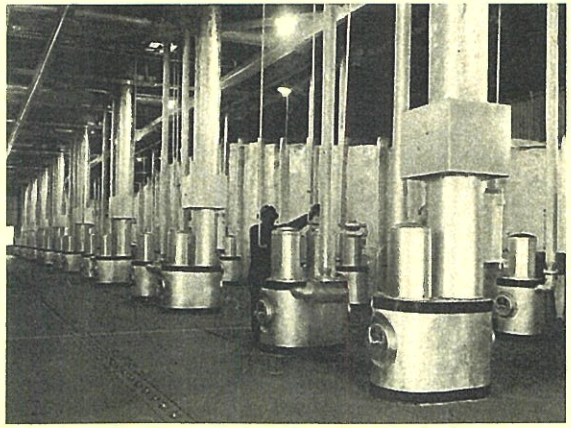


Advent of television helped remould Sudbury life styles.



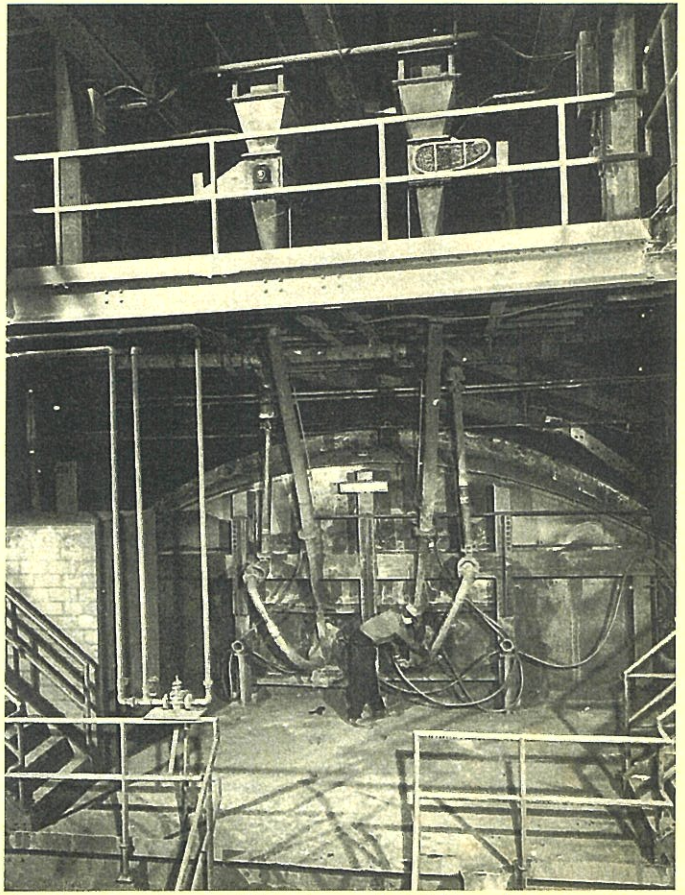
Natural gas came to Sudbury in '59.

Peaceful town of Copper Cliff, with club house in foreground.



New dust collection cottrels indicated modernization.

Shipment leaving number two sulphuric acid plant.



Flash furnace at Copper Cliff smelter enabled higher sulphur recovery.

1960

The sixties were years of intensive research at International Nickel, and the latter part of the decade was a period of unprecedented expansion and modernization.

Reforestation programs and the planting of grass and grain on eroded mine tailings were undertaken and showed continuing success. The preponderance of rock throughout the area presented difficult drainage and irrigation problems. Inco agriculturalists had learned through experimentation, trial and error that reclamation was no simple matter. Specific land uses had to be devised which took into account the delicate physical and ecological balance. But their efforts were proving fruitful, and the future held even greater promise for their work.

During the sixties, major studies were undertaken to determine the effects of sulphur compounds on various forms of vegetation. It was learned that the tolerance level of various species ranged from highly susceptible to relatively resistant. Sulphur readings taken in the Sudbury area in 1968 by a study group sponsored by government and industry showed that fumigation was not a continuous process. Of all readings taken by the scientists throughout the year, 87 per cent registered zero on the sulphur autometer. Of the other 13 per cent, only a few readings indicated a potential for severe fumigation damage. However, sulphur burns were noted at distances from Copper Cliff of 50 to 60 miles.

The time had come to put together all acquired knowledge about the regional environment, about the effects of sulphur dioxide and other potential contaminants, and make a determined effort to end pollution problems. When the first high stacks were built 30 years earlier, environmental knowledge was limited, as was technological ability. But in the interim, technology had advanced to the point where high stacks could be designed with confidence.

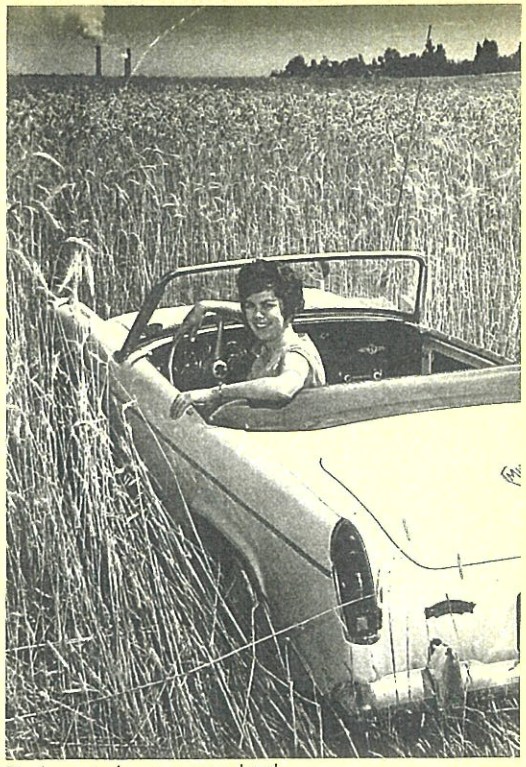
Substantial experience had been gained by studying high chimneys of advanced design in Europe and North America. In 1969, International Nickel announced that it planned to build the tallest stack in the world – 1,250 feet, or as high as the Empire State Building – at Copper Cliff to replace the three existing chimneys at the smelter complex. It was designed in consultation with provincial authorities and one of the world's leading authorities on sulphur dioxide emission and control.

The new stack would eliminate the Copper Cliff operations as a potential source of fumigation damage. This would be accomplished by emitting smelter gas from the "superstack" under controlled conditions of volume, temperature and velocity to ensure minimum, harmless ground level concentrations of sulphur dioxide. Dust emissions would also be further abated by enlarging electrostatic precipitator capacity.

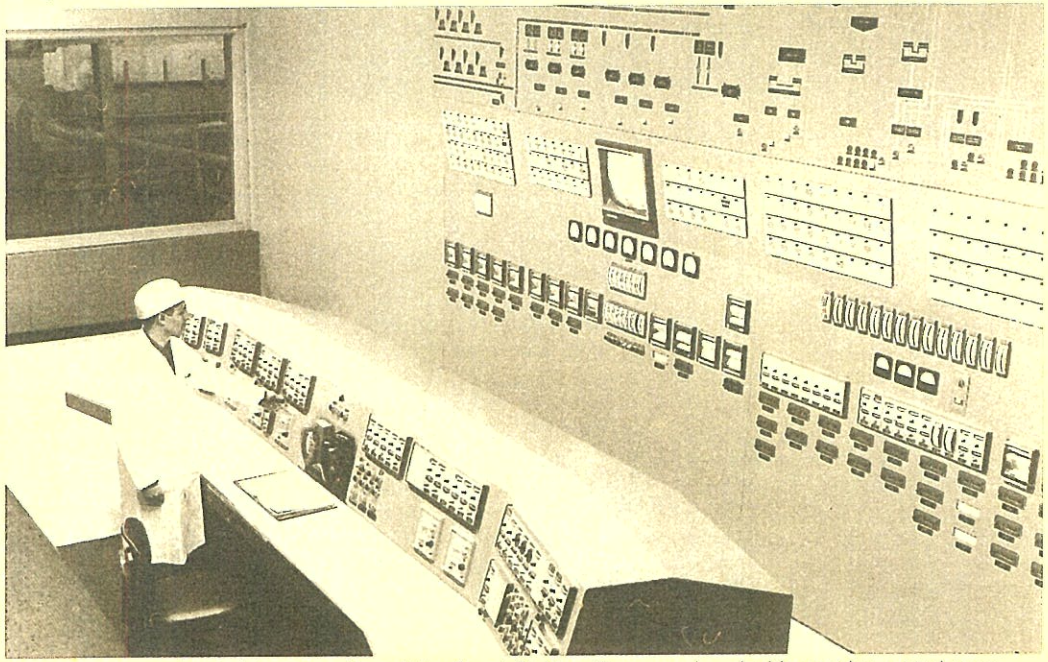
The new stack would be an interim measure while the Company continued intensive research to develop other processes for sulphur recovery.

During the sixties, sulphuric acid operations were expanded twice – in '63 and '67 – further important steps in reducing sulphur dioxide emissions. The acid plant that came into production in 1967 with a capacity of 1,400 tons per day was the largest of its kind in the world. But even this would pale in the light of future expansion.

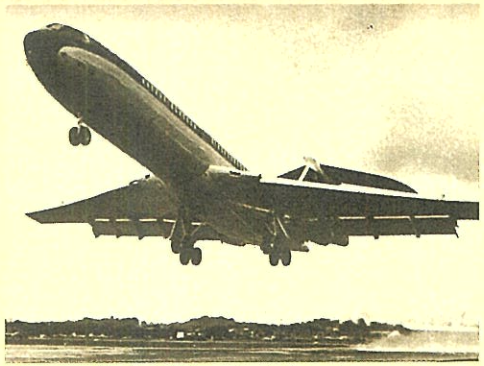
Glimpse of stocking no longer shocking.



Rock waste became grassland.

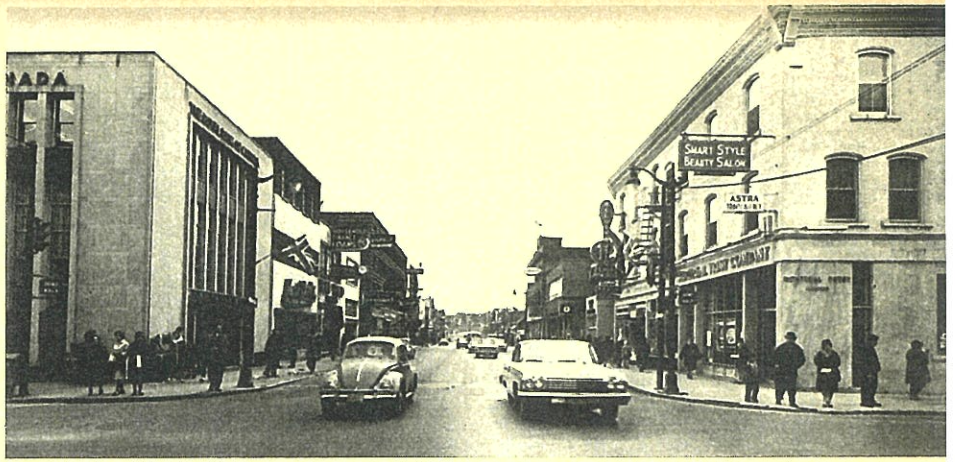


Increasing automation had become a fact of life. Frood-Stobie mill was equipped with complex control room.

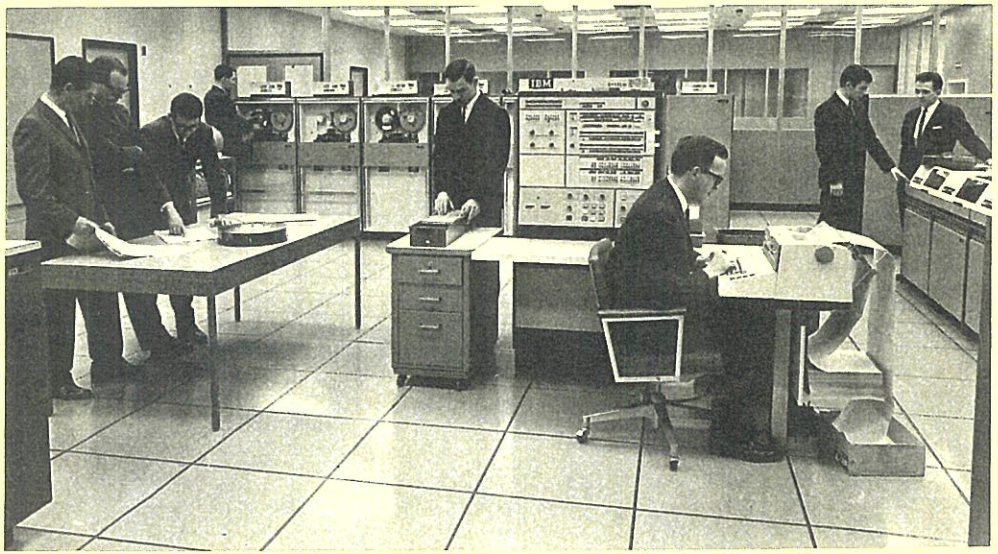


Giant jets like VC-10 required high stress metals.

Sleek new trains kept pace with jet age.

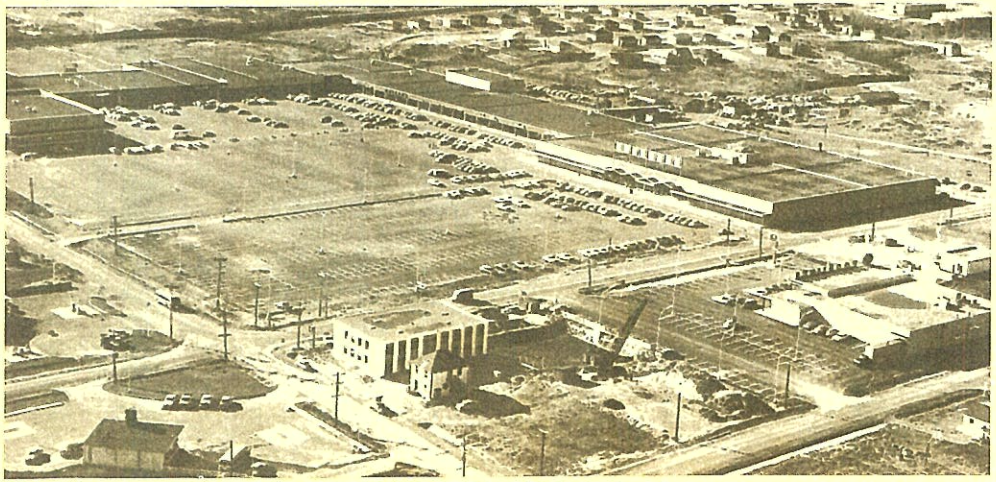


Downtown core remained "heart" of city despite rapid growth in outlying districts.

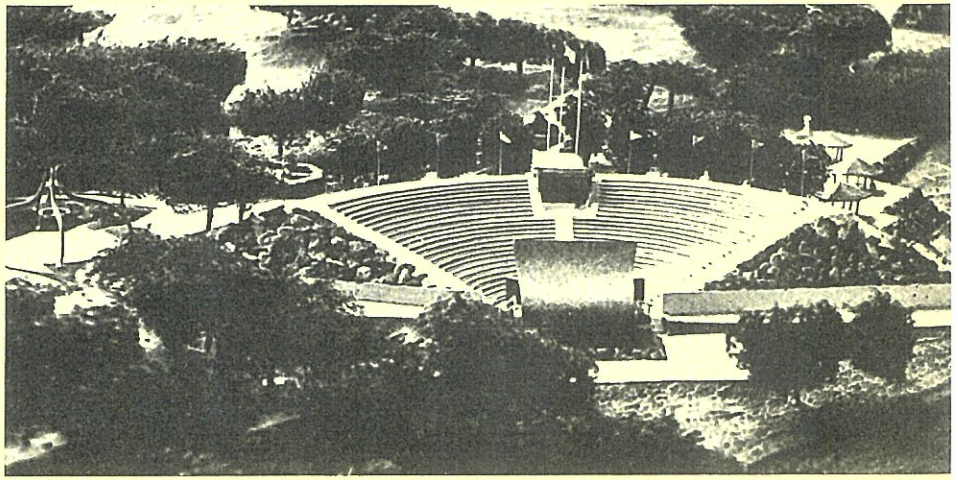


Computer age came to Copper Cliff with building of Inco Data Processing Centre.

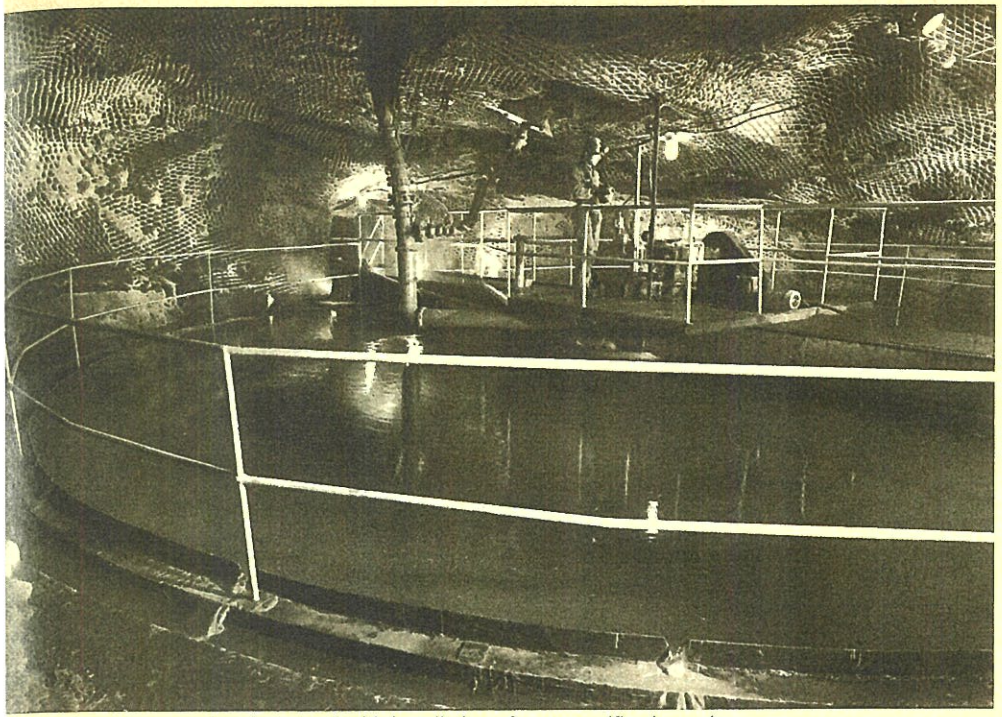
Lake Ramsey offered tranquility and recreation for growing population.



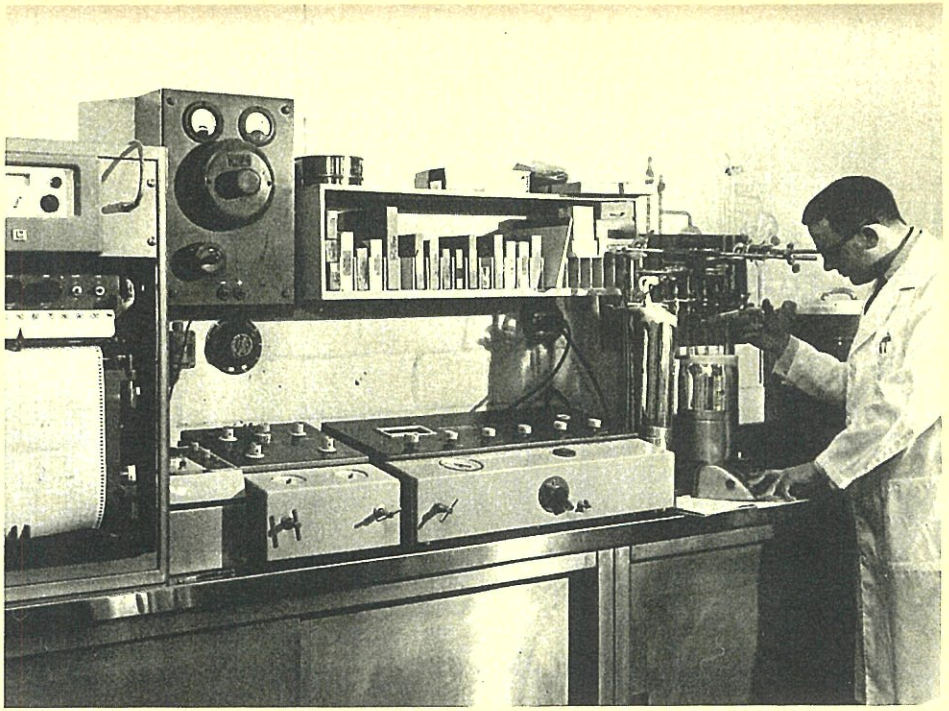
Convenience-living became part of Sudbury scene. New Sudbury shopping centre.



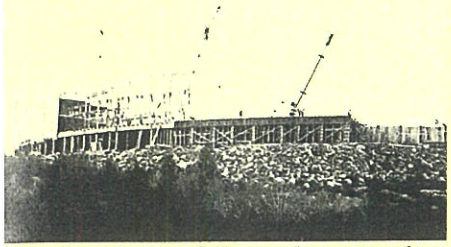
Model of Bell Park amphitheatre on shore of Lake Ramsey would soon become a reality.



Pollution control moved underground with installation of water purification units.

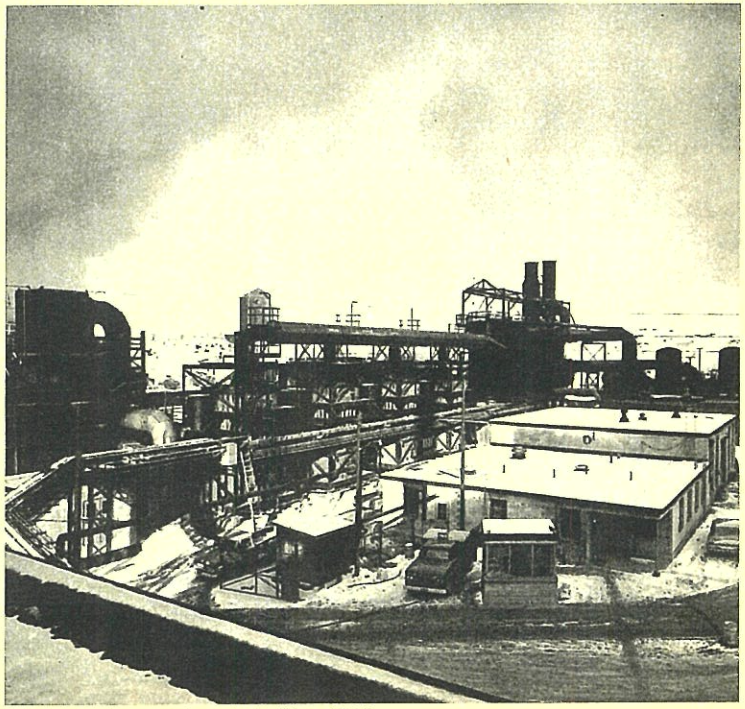


Advanced equipment at Copper Cliff laboratory helped Inco keep pace with scientific research.

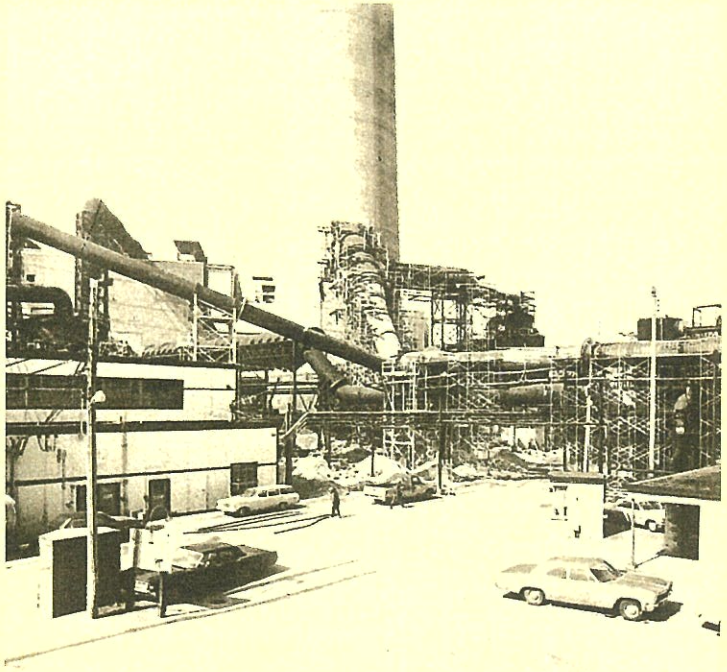


University of Sudbury College under construction.

eading sulphur autometer.



Extension to sulphuric acid facility, 1964.



Pollution abatement took giant step with expansion of acid facility in '67.

1970

In the first year of this exciting new decade – the Age of Aquarius when men of good intention everywhere appealed for an era of human enlightenment – the new high stack made its appearance on the Sudbury horizon. It received much criticism, because to many it seemed to epitomize the old idea of progress through "quantity" rather than the enlightened concept of improving the "quality" of the human environment. But Inco staved off the criticism, confident that the technology put into the huge stack would, indeed, improve the quality of the regional environment. It would be the end of the following year before the chimney would actually be in operation.

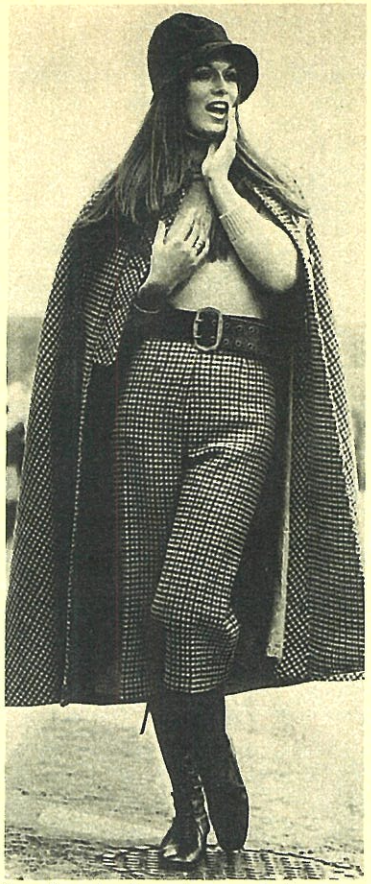
At the same time, it was announced that Canadian Industries Limited would operate a new Inco-financed acid plant. It would produce a potential 2,300 tons of sulphuric acid per day, thereby doubling the capacity of the complex. This plant was to be in operation by the end of 1972, at which time the Company would be fixing 90 per cent of the sulphur dioxide generated at the iron ore recovery plant, and would be fixing 40 per cent of all sulphur dioxide generated at Copper Cliff.

Beyond that, the Company had mapped out a plan of action in consultation with provincial authorities to reduce sulphur dioxide emissions at Copper Cliff by a total of 85 per cent and at Coniston by 90 per cent by the end of 1978. Meanwhile, intensive research continued to develop an ore treatment process designed to remove sulphur without generating sulphur dioxide.

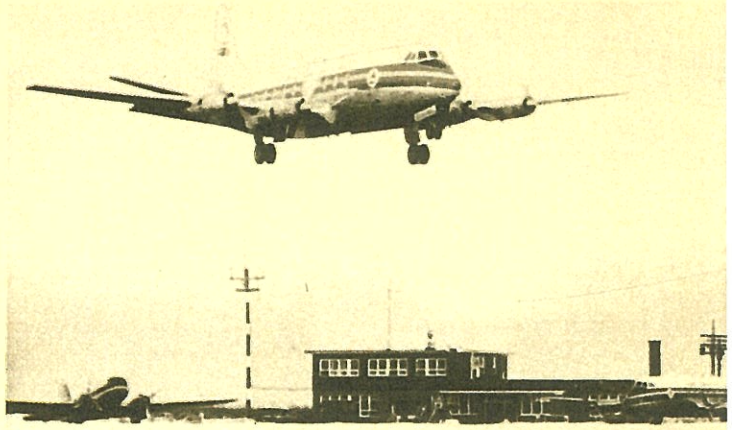
For the most part – except for the efforts of International Nickel and Falconbridge to reforest, replant and eliminate further damage to vegetation – the ugly legacy of primitive ore treatment and lack of foresight in land conservation remains with Sudburians today. But Inco's agriculturalists and other researchers, along with their colleagues at Falconbridge, at Laurentian University and other research establishments, hope that even this indelible blemish on the land can one day be removed.

Sudbury and contingent towns can never again be regarded only as the outgrowths of mining activity. Sudbury has become a diversified community destined to become the hub of the New North. It has become a major university city, a communications centre, and an important rail and trucking depot – a link with the industrial south and a gateway to the undeveloped north. But much more need be accomplished to enable Sudbury to assume its just role in the Canadian dream.

Managing the environment – as in all areas of human endeavour – requires long range planning and supervision. As past experience shows, real progress takes time, effort and determination. Inco is giving top priority to developing the technology needed to help meet pollution control objectives. And, as Chairman Henry S. Wingate assured shareholders as this decade commenced: "We have the determination."

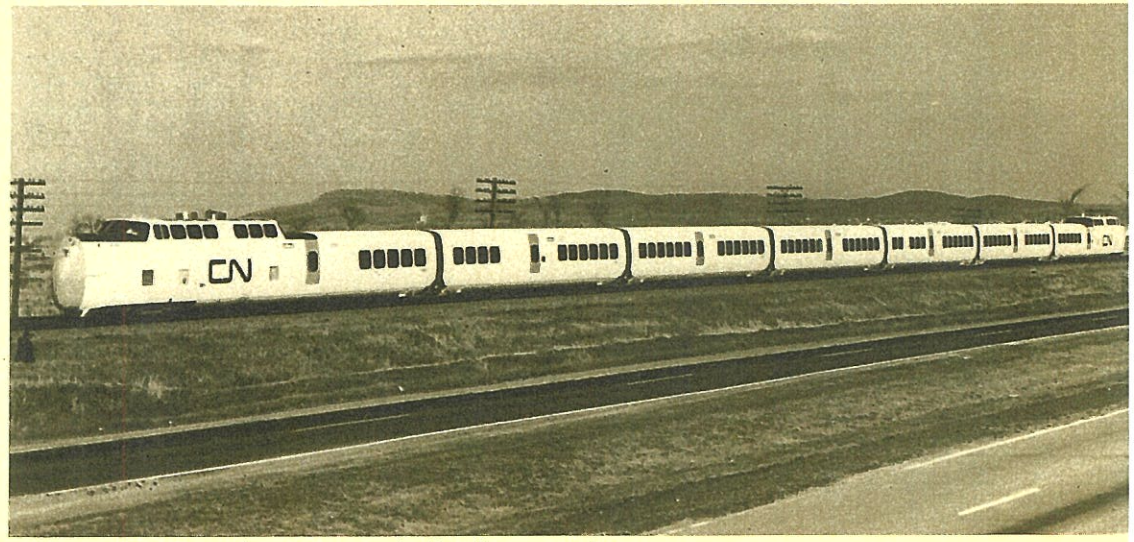


Era of pant suits and women's lib.



Sudbury airport has become key staging point in air transportation.

Major expansion program includes construction of modern nickel refinery.

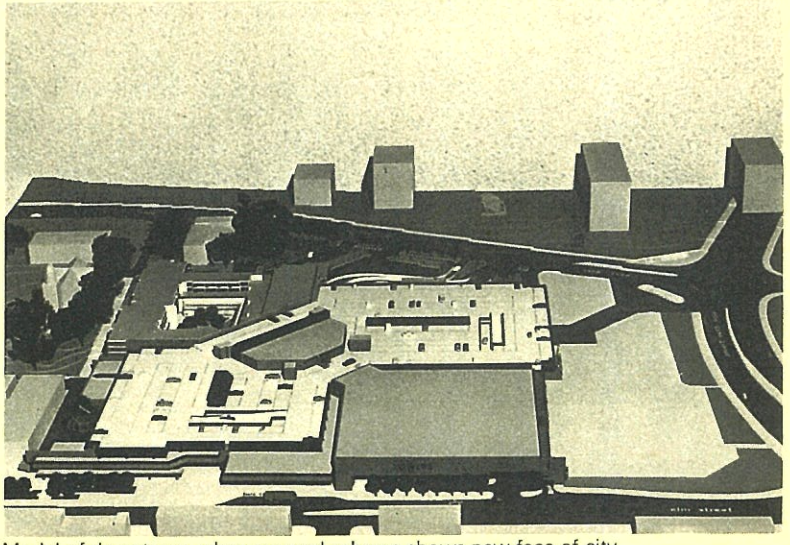


CN's streamlined turbo train sets new standard in rail transportation.

Further expansion of sulphuric acid facilities to double production capacity means long lines of acid tank cars.

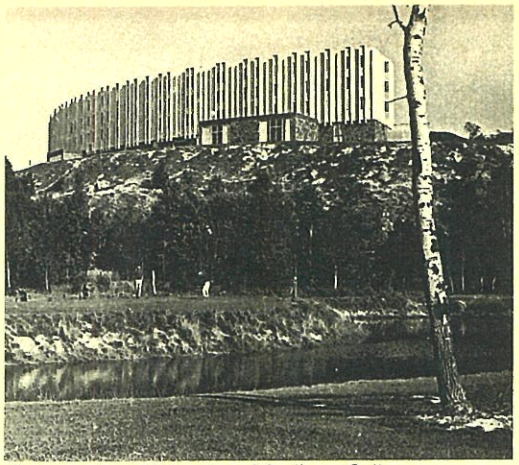
Construction of Clarabelle mill is further evidence of major expansion program.

Laurentian University including University of Sudbury College, is located on one of Canada's most attractive campuses.



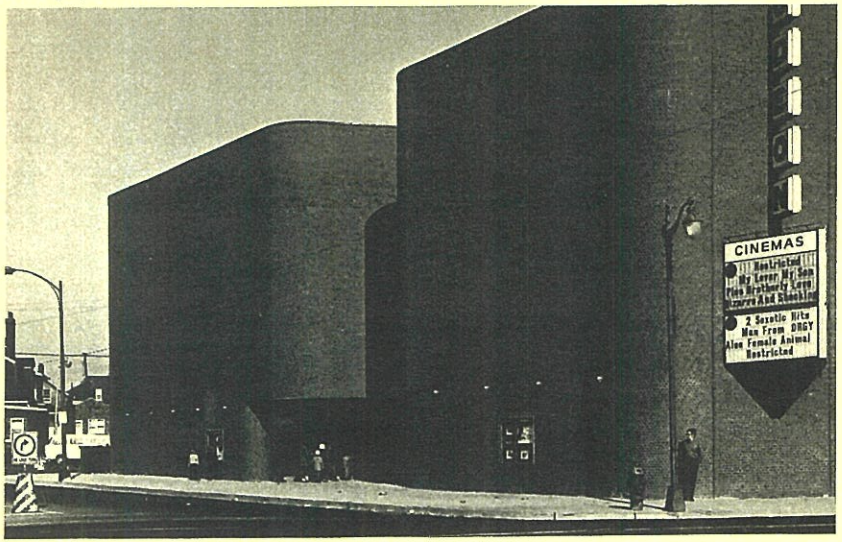
Model of downtown urban renewal scheme shows new face of city.

Beauty spots abound in Sudbury and District. Lake Ramsey remains favorite retreat.

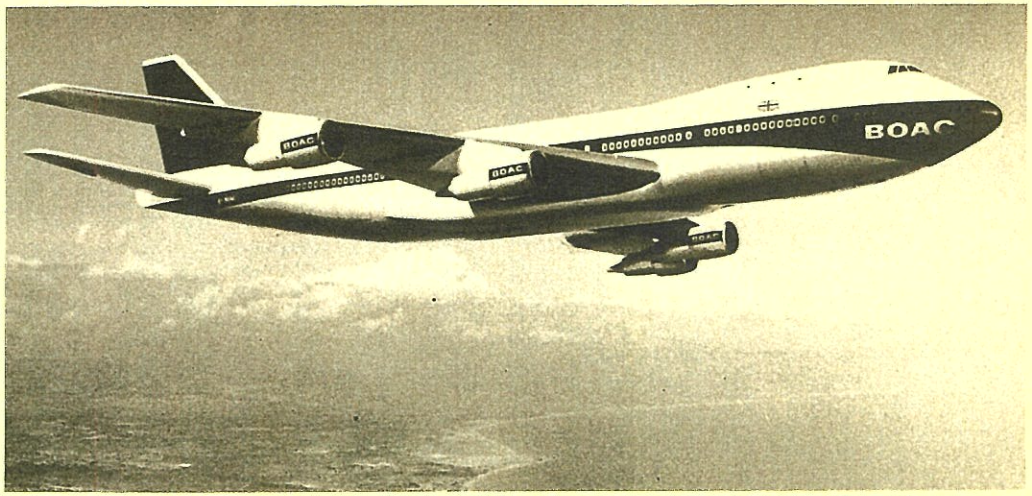


Now complete University of Sudbury College.

City is established as academic centre.

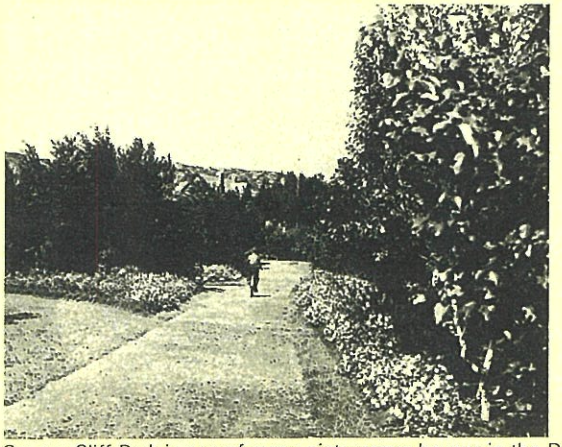


New two-level downtown cinema has striking architecture.



Boeing 747 heralds continuing advances in transportation technology, requiring high strength metals.

Sudbury's luxurious new Holiday Inn.



Copper Cliff Park is one of many picturesque havens in the District—a park for all seasons and all people.

International Nickel's giant 1,250-foot chimney has become a distinctive and unusual landmark of the Sudbury District. But it is also a milestone in pollution control, designed to widely diffuse smelter gas, with much sulphur and almost all dust already removed, so it will cause no harm to vegetation. It is an effective interim measure that will ensure clean, safe air while Inco researchers concentrate on developing a method of treating Sudbury ores that will not generate sulphur dioxide.

Grateful appreciation for the use of photographs and historical reference material is extended to:

Inco Triangle
Inco Copper Cliff Research Laboratory
The Sudbury Star
The Sudbury Historical Society
Canadian Industries Limited
Report of the Royal Ontario Nickel Commission, 1917
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Miller Services Limited

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