

Within The

INCO TRIANGLE



PLEDGE AID TO THE CAUSE

Both in the ranks and on the home front, INCO employees are doing their bit for Canada and the Allies in the war to rid the world of scourges which will make peace and security impossible as long as they are allowed to exist.

INCO men totalling more than 150 have so far enlisted for service in various branches of the army and the air force, and word has come back from the training camps of the high calibre of these recruits. At home, besides performing work which is a vital need to the Empire cause, Company employees have united to form the War Relief Club and have voluntarily pledged two days' pay a year to Canada's war charities.

To relieve Company employees of repeated requests from various war work organizations for contributions, and to assure its members maximum results from their donations by preventing overlapping and duplication, the War Relief Club has been registered under the department of the Secretary of State at Ottawa, as it was during the last war, and a charter has been issued. E. A. Collins is president, J. R. O'Donnell is treasurer, and James Hazleden is secretary. Assisting these officers are representatives of every department in the INCO organization, and this board will distribute funds through the many channels seeking support for war charities. Donations of \$5,000 each to the Sudbury and Copper Cliff branches of the Red Cross have already been authorized for payment when the first payroll and salary deduction is made on January 8. This initial deduction was originally planned for December 8, but Welfare societies requested that it be deferred until after Christmas. More than 88% of INCO employees in this division signed the two-days-pay-a-year pledge, and many non-employee residents of INCO towns have volunteered similar contributions.

A large amount of the money will be expended in the Nickel District to furnish wool, cloth and other necessities in the making of comforts and needs for the soldiers in training at home and on active service at the front. All applications for financial assistance which reach the War Relief Club will be passed upon by the board of directors, and in this way the club will minimize the collection of money by unauthorized charities and protect Company employees from being victimized by canvassers who hope to capitalize upon patriotic fervor.

Among the many organizations which are expected to receive financial assistance from the War Relief Club of Copper Cliff are the Red Cross, Patriotic Fund, Salvation Army, St. John's Ambulance Association, the Canadian Legion War Service Board and others which have local organizations.

Another major function of the club will be to keep a permanent record of all INCO employees who enlist. This record will include regimental numbers and addresses, in order that from time to time gift parcels can be forwarded to all such employees in active service, no matter where they are stationed.

The War Relief Club will also render every possible assistance to the families of enlisted employees. At the conclusion of the First Great War funds were devoted to this service and the War Relief Club continued to function until 1926, giving very material assistance to ex-servicemen and

Action on Two Fronts



These two photographs illustrate the contribution which INCO employees are making to the cause of the Empire, both at home and in the ranks. Top picture shows three ex-Froodians, flashing broad grins in camp at Long Branch, in the smart uniforms of the Toronto Scottish: Ted Dandy, Arthur Cuppage, and "Bake" Baker. Both Dandy and Baker are former Frood Welfare Association presidents. The second picture explains itself. The family is that of Mr. and Mrs. Albert Bouillon, and the bright-looking kiddies are Gerald (holding the baby, Ronald), Rita, Claude, and Lawrence. Their dad works in the silver refinery at ORCO.

their families. A similar program is contemplated by the present organization.

Announcement has been made by the Company of the special considerations it has arranged for the benefit of employees who enlist in the British Allied Forces.

The Company will endeavor to return to active service all employees who enlist from its employ for military service in the British Allied Forces and who return promptly after war service for re-employment.

Membership in the Retirement System will be continued for all employees who were on the Company payroll on or before September 3, 1939, and who enlist from INCO employ and serve in the British Allied Forces either at home or abroad.

War service in the British Allied Forces during the present European war will be

allowed as "credited service" to all employees who enlist from and who return promptly to our employ.

The benefits of the Retirement System, as detailed in the Rules and Regulations, will be on exactly the same basis as if enlisted men were in the active employ of the Company.

Claims for death benefits arising during the war must be made within one year after the termination of the war. Claims for other benefits must be made within one year from the date of the employee's discharge from war service.

The group life insurance and the sickness and non-occupational accident insurance will be available immediately to returned employees without the necessity of medical examination, provided, of course, that the group coverage is still in force.



Published for all employees of The International Nickel Company of Canada, Limited.
 EDITORIAL OFFICE COPPER CLIFF, ONT.
 Don M. Dunbar, Editor

And Many of Them!

It has been Triangle's annual Yuletide custom to bring to its readers a Christmas greeting from Vice-President Donald MacAskill, on behalf of the Company. Why shouldn't it be the other way around this year?

To those whose vision and courage in the face of heavy handicaps years ago laid the foundation for the great institution of today; to those whose sincerity of purpose is reflected in the broad program for the security and happiness of the Company's employees; to those at the helm of operations whose job of providing all our jobs must always be a heavy responsibility and often a wearisome burden; to them all, from all of us, with cheerful apology for our shortcomings and solemn assurance of our honest intent, A Merry Christmas and a Happy New Year!!!!

An Active Role

A source of pride to INCO employees is the Company's contract with the British Government for the delivery of some 237,000,000 pounds of copper during the next 12 months. The deal was announced in late October when Great Britain agreed to purchase around 80 per cent. of Canada's electrolytic copper production for a year. Some 60 per cent. of this tonnage will come from INCO mines alone.

While it is as a ploughshare rather than as a sword that INCO production has won its way on such a large scale into the markets of the world, nevertheless there is satisfaction in the knowledge that it will be used to gird the Allies for their fight against the rapacious evils which threaten the civilization on which its progress has been based. Having signed his War Relief Club pledge, and feeling now that his everyday work is also being directed against the common foe, the average employee can forget the feeling of personal futility which this strange war may to date have given him.

And there is a further source of pride in the manner in which the Company is co-operating financially with the British Government. Although it would have every reason to expect a much better price for its copper over the course of the next year, INCO readily signed the contract at the average price it received over the eight-month period preceding the war, 10.02 cents per pound. It is not difficult to realize the difference

"Them Was the Days!"



T.J. Patterson, 2b. G.M. Ferguson, lf. C. Cummings, c. T.J. Birney, cf. W.T. Waterbury, rf. R.J. Meggs, 3b.
 T. Strong, rf. W. Dopson, p. W. Acheson, 1st. Bert Flynn, ss. M.T. Lee, p. W.J. Trencor, p.
 C. O'Reilly, 1bc. C. Carboneau, cf. D. Owens, 2nd. J. Destefano, ss.

Cliff's Team 20 Years Ago

which an extra three or four cents a pound would make on 237,000,000 pounds of copper. The Company's patriotic attitude in this respect, and the generous response it is making to requests from various war charities, inspires the respect and admiration of its employees.

IMPROVE GOLD PLATE

The use of bright nickel coating beneath gold has been found valuable in improving gold-plated pieces, especially in objects where intricate and complicated designs must be covered. Even in the plating of expensive pieces, an undercoating of the nickel is said to cover surface irregularities evenly and uniformly, thus presenting a hard and lustrous foundation upon which a better and more durable plating of gold can be applied than was obtained by previous methods.

The Cover

The Christmas tree at INCO Employees Club, its crowning star almost touching the high vaulted ceiling and its branches hung with a profusion of beautiful decorations, provided the background for Triangle's Christmas cover picture.

The dainty wee miss who is so eagerly accepting her present from Santa Claus is Sandra, daughter of Dr. and Mrs. A. H. Duncan. And the pseudo Santa, gallantly pinch-hitting for the occasion behind a formidably cheerful front of pillows and cotton batten whiskers, is none other than Club Steward George Barnett.

Just a flower from an old bouquet, or something, is this photograph from the dear dead days beyond recall. And although the past 20 years have cloaked most of its figures with the aura of middle-aged dignity, there are still traces of the youthful fire and vigor which marked Copper Cliff's senior baseball team back in 1918.

No less than 11 of the 16 in the group still reside in Copper Cliff.

T. J. Patterson has passed on, but George Ferguson is a foreman on the reverbs, Charlie Cummings is foreman of the locomotive shop, Tom Birney is in charge of the Company's real estate department, W. T. Waterbury is general purchasing agent. Death has taken R. J. Meggs. Tom Strong is fitter foreman in the concentrator, Bill Dopson is a foreman on the reverbs, W. Acheson is a converter building foreman, Bert Flynn is king's printer, Tod Lee is chief dispatcher and manager of Bob Mossey, Bill Trezise is foreman of the machine shop. Cliff Carboneau is a machinist in Hamilton, Dalton Owens is a foreman on the copper converters, and J. Destefano is with the United States secret service in Detroit. Inset, Charlie O'Reilly, has passed away.

The official raconteur of early days sports anecdotes, Bert Flynn, admits the team wasn't any world-beater, but it could take care of lineups from places like Parry Sound, and it had a lot of fun.

APPEALS TO CRABS

Crab fishermen use Monel wire for crab traps because it not only provides the requisite strength, toughness, and resistance to sea water, but, believe it or not, its color appeals to crabs. Fishermen vow they catch two to three times as many crabs in Monel traps as in those made of copper and steel.

Cover 17,000 Miles in Month

An inspection trip to study equipment and operations at various large mining properties in South America and the United States was recently made for INCO by R. D. Parker and S. A. Crandall. The accompanying photos and descriptions were provided for Triangle readers by S. A. Crandall:

To undertake the description of a trip which lasted a month, covered 17,000 miles, 14,000 of which were by plane, and touched at 15 different countries and 22 states, within the limited space of this column is difficult.

The flight started from Buffalo, touched New York City and Miami. From Miami, we took a clipper ship, landed at Cuba and Jamaica and flew over the Caribbean Sea to the Panama Canal. From there we took a Douglas Transport plane along the Western coast of South America, through Columbia, Ecuador, and Peru to Antofogasta, Chile.

We spent a week at the property of the Chile Exploration Co., at Chucucamata, examining their mine and surface plant as well as the nitrate plants at Maria Elena and Pedro de Valdivia. All of these properties are up on a high pampas ranging from 6,000 to 10,000 feet above sea-level. This is one section of the country where it never rains and the only source of water is from the Andes mountains. The picture is taken from the rim of the Desart de Atacama, overlooking the San Pedro valley. The mountains in the background are the main range of the Andes and the one peak showing is about 20,000 feet high or 10,000 feet above the elevation from which the picture was taken.

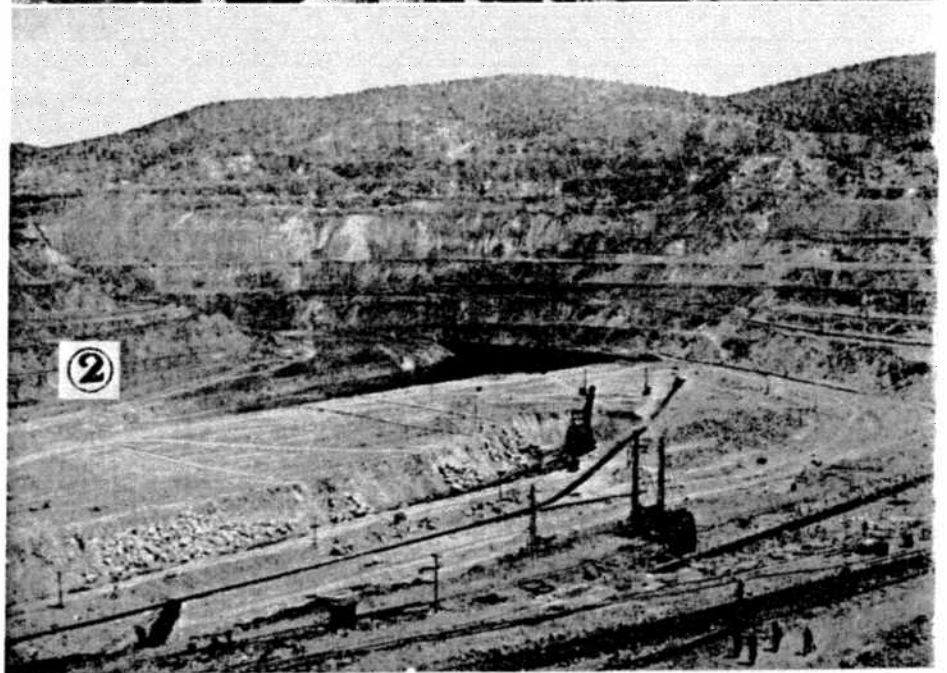
Barren and dry as the country is, it is capable of infinite beauty. The sunset we saw on these mountains the day the picture was taken was the most beautiful one it is possible to imagine. Words cannot describe it.

The mining properties are all low-grade, dependent on large scale production and low costs to work at a profit. Both copper and nitrate depend on steam shovel operation where whole trains are loaded at a time and treated in modern up-to-date plants. Chile Exploration was mining and treating about 45,000 tons of ore in two shifts. The two nitrate plants were handling about 20,000 and 25,000 tons per day each.

Coming back we retraced our path as far as the Panama Canal and from there branched off through Central America and Mexico. The chief point of interest on this leg of the trip was the City of Guatemala. After the dirty squalor that we had seen in South America, to get in a town that was neat, orderly and representative of an attempt to be modern, was quite a treat. Of course had we settled down in some of the larger cities such as Lima, Peru or Santiago, Chile, our opinion would probably have been different. Flying over a place does not give one a very good idea of what the city is really like. In Guatemala, we had a chance to get around and see the town and found it very beautiful and interesting.

Continuing our flight we passed the complete length of Mexico, flew over Mexico City and spent an hour and a half at the airport there, but it was so far out from the city that it was impossible to get a taxi to take us into town in the time we had available.

We flew on into Brownsville, Texas and then on throughout the length of Texas into El Paso. From El Paso to Los Angeles we travelled via auto, airplane and train, as best suited our itinerary, and visited



several properties. Prominent were the Chino Copper Co., in New Mexico, and the Phelps Dodge Co., at Ajo, Arizona. The photograph represents the open pit at Chino. This is a typical pit operation. By that is meant the ore body lies below the level of the surrounding country and it is necessary to run spiral tracks along the benches on the sides of the pit. On a pit operation the trains go down into the pit empty and come back loaded.

The method of mining consists of drilling holes along the edge of the benches at such spacing as the hardness of the ore requires, loading with powder and blasting. One such blast was put off while we were there, 63 holes ranging for a quarter of a mile along a bench about 80 feet high and loaded with 25 tons of powder being shot. This blast broke some 25,000 tons of ore.

Continuing West we visited Los Angeles and San Francisco, returning by way of **3** Salt Lake City, Utah. Here we visited the property of the Utah Copper Co., at Bingham Canyon, shown in the third picture. This property differs from the one at Chino in that the ore body consists of a whole mountain. Instead of the trains going down into a pit after a load they climb a mountain. The ore at Bingham is softer too and does not require the same amount of blasting as the other mines we visited.

Without going into figures it can be said as a generality that the ores in these various open pit operations are very low grade and will run around 1% in copper. This means they have to mine one ton of ore to get 20 pounds of copper and, since the ore body is never uniform or is overlaid by a layer of barren rock, they have to mine an additional ton of waste rock to get this ore. It will be seen therefore that the margin of profit is very small and great mining and metallurgical skill is required to make it pay.

After the day spent at Bingham, we hopped the sleeper plane out of Salt Lake City at midnight and were in Chicago at 8.30 the next morning.

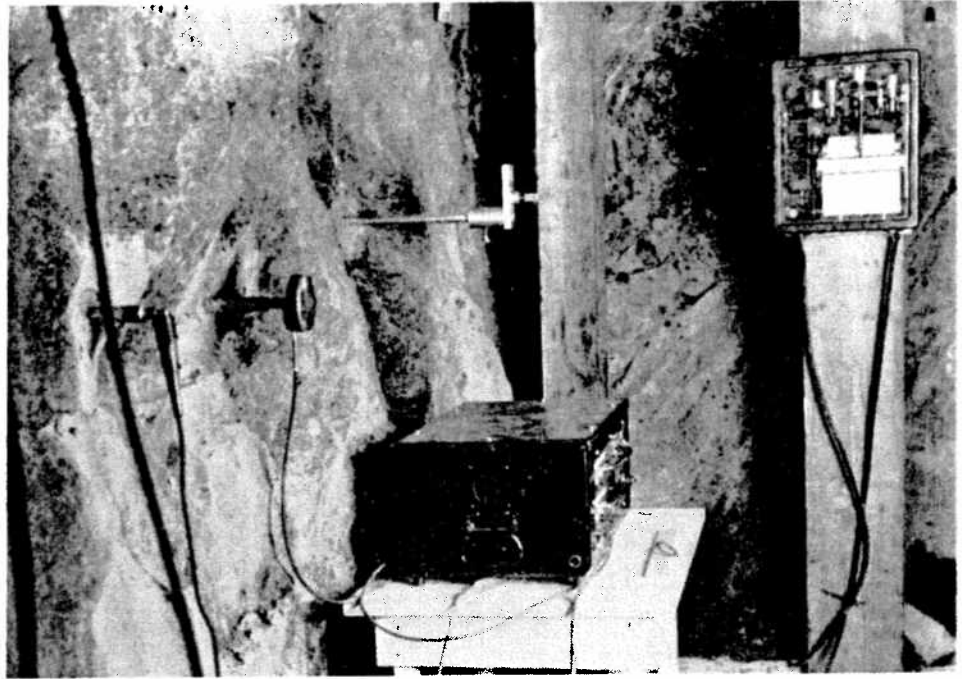
Nickel's Market Will Be Maintained

That United States will continue to be the largest buyer of Canadian nickel under war conditions as in time of peace and that industrial uses of the metal, largely developed since the last war, will continue to account for the majority of production is indicated by an analysis of the present situation made by J. H. Carmical in the New York Times.

There is little fear that the uninterrupted flow of Canadian nickel to the United States will be interfered with, he says, adding that the price has not changed since 1926. Mr. Carmical quotes a report that industrial customers of International Nickel in the United States feel assured of ample supplies and expect no change in price. Last year, world use of nickel was estimated to be 92,500 metric tons, of which United States' requirements accounted for 23,400 metric tons. Even so, this U.S. figure was considered to be far below normal due to decreased industrial activity. Mr. Carmical reports it as only 50 per cent of the 1937 tonnage.

From authoritative sources, he reveals that there has been substitution of cheaper materials than nickel for this metal in such war uses as bullet jackets, rifle and machine gun barrels, bayonet steel. It is a strategic metal in wartime, however, because of its alloying uses throughout industry generally and for its applications in trucks, machinery and large forgings.

Further Research on Rockbursts



New Gadgets Are Developed

Continuing their assault on the rock-burst problem, INCO engineers, electricians, and geologists have designed two new instruments for the measurement of the very small movements or vibrations set up in the rocks in INCO mines.

The instrument to measure very small movements between the walls of a drift is simply a polished steel plate which is pulled along under a diamond point by a Big Ben clock mechanism. The diamond point rides on a small carriage running at right angles to the plate. Wires are attached to either end of the diamond carriage, one wire running on to one wall of the drift and the other riding over a pulley and supporting a heavy weight which hangs free. The frame carrying the steel plate and clock is secured to the opposite side of the drift. The clock drives the plate at the rate of one inch in 24 hours, and if there is no movement or disturbance in the wall, the diamond point makes a straight scratch the full length of the plate. If, on the other hand, there is some movement, it will be recorded. The exact time that the movement occurred can be determined by measuring the distance along the plate from the zero point, and the exact amount of the movement can be measured by putting the steel plate under a microscope. Measurements as little as .005 mm., or about .0002 inches, can be detected. A very small Monel wire is used with the instrument because of its strength and resistance to corrosion.

The other instrument is set alongside in the same station. It is simply a small crystal detector similar to those used in radio receiving sets, attached to one wall of the drift and coupled to a suitable vacuum tube amplifier, the output of which is connected with a recording meter. The detector, instead of picking up electrical radio waves, picks up any actual vibrations in the rocks. The amplifier exaggerates these

vibrations, and the recording meter charts them, 24 hours a day.

By this means it is hoped that those smaller shocks and breaks in the rocks which cannot be heard can be recorded so that any action of rock which is taking weight can be recorded before it begins to fail or before there is sufficient pressure to show on timber and other supports.

If this can be done, then steps can be taken to correct the situation before damage is done.

Photo shows the vibration instrument set up in Frood Mine. On the extreme left is the ground connection to a long brass rod cemented into a diamond drill hole. Just to the right, the small round box is the crystal detector, also fastened to a long brass rod. In the lower centre is the amplifier, designed and built by the INCO electrical department, and on the wall behind is the recording meter.

Ski Club Plans New Jumps at Cliff

A new ski jump from which skiers may soar 100 feet or more is being planned by the Copper Cliff Ski Club this winter, and present indications are the club will have its new 30-meter unit constructed shortly.

The profile of the hill and proposed jump has been presented to the Ontario Ski Zone Committee in Toronto, and the club now is awaiting final decision on the matter.

A new slate of officers was elected at the annual general meeting of the club.

Jack Cole succeeds Bruce Allen as president, with Lange Winkler vice-president, Naomi Perras secretary, Clare Young treasurer and Rita Sauriol social convener. Chairman of the technical committee is Kel Sproule; club instructor, Jack Stackhouse; and junior club supervisor, Bruce Allen.

Other ski clubs of the district, notably Levack, have been getting in some valuable work on their trails in anticipation of a banner season.

There Is a Santa Claus After All

She knew, of course, that winter was on its way and that it would probably bring a pretty cheerless Christmas in any event. The main thing was to find a safe, warm spot for her litter, but why she ever picked such a place as she did is beyond human understanding. Maybe they were unkind to her where she was before, so that she knew only fear and distrust of people and, all alone in her first big crisis, instinctively turned back to the ways of her ancestors and sought the best hiding place she could find, far off the beaten track but not too far from a known food supply.

She must have roamed a long way in her hunt, because nobody in Coniston could remember having seen her before. Eventually she found this tiny cave away out on the bleak, bare expanse of slag pile where the ground had buckled and bulged under the searing weight of the hot slag. The hole wasn't much bigger than an apple box but it had a roof over it. So she set to work and dug out two entrances to it for safety's sake, and then she burrowed into the sand to make her bed as comfortable as she could.

At night, though heavy with her young, she found a way to ford the creek and prowled off to Coniston, more than a mile away, to prospect for food and to establish sources of supply she could safely visit in nights to come when there would be many more mouths beside her own and the need would be infinitely more urgent.

One day about six weeks ago, Ed Austin, superintendent of Coniston smelter, was making a periodical inspection of the slag dump and came upon her and her little family. She was dozing in the sun beside her home, and the pups were frisking around her—seven of the best-looking little collies you ever saw in your life, fat and sleek and a tremendous credit to her.

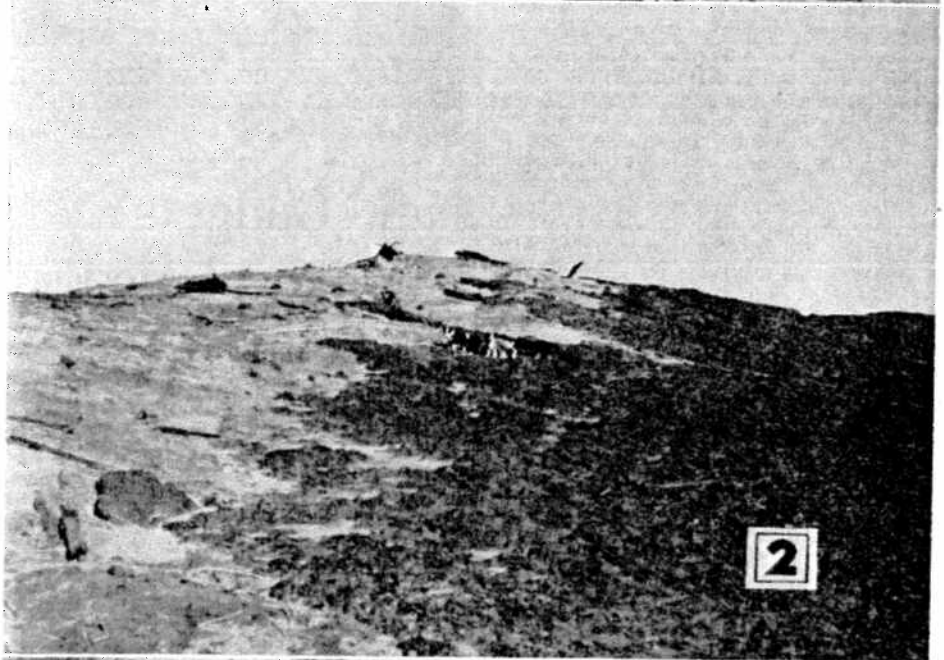
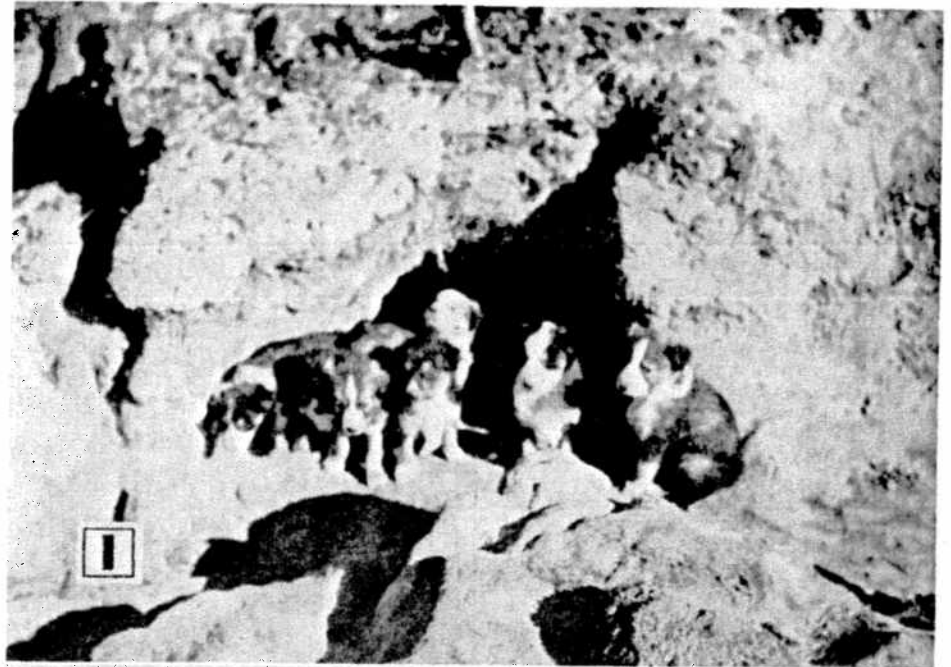
When he got back to the plant, Ed told Sgt. John Angove about her, and the sergeant and Roy Hancock and Don Rogerson decided they'd better go and bring her in. Of all the cheerless, dreary places for a young mother and her litter to spend Christmas, this was it. Rogerson took his camera along and made these pictures of it. She would have none of the men at first, and might have fought bitterly if Hancock had not gone about the job slowly and carefully, gradually winning her confidence so that she finally allowed him to reach down into her cave and, one by one, bring out her wriggling little bairns.

Back in Coniston everybody who saw the pups wanted one, they were such cute, healthy little fellows. Joe Isnay got one, and Bill Chicquen, Helen Rivard, Carmen Bray and Nick Destefano.

Hancock took one himself and then, with a happy inspiration, sent the mother away to his father's farm near Toronto.

He had a letter from his father the other day, saying that she was turning out to be a splendid farm dog. They've named her Collie. Probably she'll be very happy down there on Christmas Day, knowing that kindness and goodwill have come to the babes she bore in that lowly manger.

A monel conveyor belt which runs 8,000 pounds of fish per hour under a salt spray in order to clean them thoroughly, is used in one of the processes employed in preparing fresh fish for market.



Given Gifts On Retirement

Following their custom of their fellow-workers retiring on Company pension, **1** members of the mechanical department at Copper Cliff assembled at Memorial Community Hall for a presentation to John Hill, whose service to INCO terminated on November 1 after more than 43 years. A well-known and popular machinist, the guest of honor was presented with a suitably engraved gold watch by J. W. Garrow, Smelter Master Mechanic, on behalf of the men. Photo shows Mr. Hill receiving a hearty handshake along with the gift. E. A. Collins spoke briefly, telling of the interest which Robert C. Stanley, president of the Company, has always shown in the pensioners. He explained that one of his duties is to make annual visits, on Mr. Stanley's behalf, to see that all is well with them.

Another popular Copper Cliff employee who joined the ranks of the pensioners on **2** November 1 was Newton Morrison, slag dump boss, who had 30 years and 11 months of service to his credit, and is seen here with his wife and their little grandchild, Shirley Cowcill. A representative group of his associates from the reverb department visited him at his home and presented him with a handsome electric lamp on behalf of the men. "You will have to find another bunch of victims on whom to play your practical jokes," their address of farewell humorously read. "The pensioners gathering in downtown Sudbury had better be on their guard from now on." Dennis O'Reilly, Bob Goudie and Bob Archibald came along to join in the reminiscences, and a most enjoyable evening was spent. Although it was Hallowe'en, official night for pranksters, their host must have decided to take an evening off because everybody got home safely.

Other former reverb employees, now pensioners, who have been honored by their fellow-workers, were Henry Alder, who re-ired in February of 1937, and John Myher, who retired last February.

At Coaiston on August 1, John McMullen walked off his last shift as general smelter foreman. He started work for the Mond Nickel Company at the old Victoria Mine back in 1906, and had 33 years and three months of service to his credit when he became a pensioner. Ore was transferred by bucket line from the Victoria to the roast beds when he first arrived on the scene, and a bucket line was also used to transport it to the smelter after it had roasted on its cordwood pyre for from three to five months. In two-wheeled buggies, holding about 800 pounds each, the ore was trundled to the open blast furnaces and dumped in. Sometimes, in the dumping process, the buggy would tip over and fall in too. Then the blast had to be shut off while a chain was attached and the buggy rescued. Slag from the converters was drawn off into pots holding from 300 to 400 pounds each, and the pots were pushed out to the dump by hand.

Mr. McMullen was born in Westmeath township, near Renfrew, in 1879. He's **3** looking forward to some visits to the old farm, and also to a trip West to Calgary to visit relatives. The camera shows him with his wife, poring over a road map as they plan a jaunt. To the right behind them is the mantel clock which was one of the gifts presented to them by the men in the smelter, and for which they have asked the Triangle to express their sincere appreciation.





JOHN W. GARROW

Two young fellows off the East train were Bob Carmichael's passengers that July morning in 1901 when he giddapped his faithful nags and headed his stage across the flat from Sudbury to Copper Cliff. Both were talking enthusiastically of jobs they had secured with the Canadian Copper Company, but as they neared their destination the conversation slackened and gave way to fits of furious coughing as waves of sulphur smoke from the roast beds rolled over them. When they finally reached the town the two shook hands but only one of them got down off the stage; the other went straight back to Sudbury, caught the first train out, and hasn't been seen since.

The one who stayed was Jack (John Willis) Garrow, fresh from the wilds of Lachine and as snappy a machinist as ever



stripped a lathe gear. He was born at Oshawa December 7, 1876, son of a foreman for Dominion Bridge Company, and was about five years old when the family moved to Lachine. His earlier years in the Montreal suburb were spent in school and in mischief; he had the fastest bike in town and, given a reasonable chance, could pedal his way out of any sort of a scrape.

When he was 20 he started work with Dominion Bridge and learned his trade; he put in a brief period in the C.P.R. shops and then heard about Copper Cliff, where good men were wanted.

Master Mechanic at Copper Cliff in those days was John Campbell, a Scot who wore a sweeping sombrero and had both sides of his trousers torn from scratching matches to keep up with an endless cigaret consumption. Foreman of the machine shop, where Jack Garrow was soon at work at a lathe, was George Craig, now a pillar

in the social and industrial fabric of Port Colborne. The shops were located where Market St. homes now stand. Charlie Ade was in charge of the first electric light plant in the town. Dr. and Mrs. Coleman, the latter better known to readers of a Toronto newspaper under the pen name of Kit, lived in "The House of Many Gables" and had about 20 Blue Bedlington terriers. John Saunders peddled drinking water to the citizens from a well behind where the Engineers' Club is now. Nos. 1, 2, 3 and 4 mines were all operating, and supplies were being trekked by horse and wagon through the bush to Creighton, which was just being organized. Bill Kilpatrick kept the post office in his store, and often the mud was so thick and deep around the McIntosh Block that wagons had to be unhitched and abandoned there until the ground dried up.

Jack Garrow steadily won promotions for his work, and when George Craig transferred to Port Colborne in 1928, he became Smelter Master Mechanic. He likes taking a fling at jobs that other people think impossible, and more than once has confounded the city slickers with ingenious solutions to apparently hopeless machining problems. The job that has tickled him most of all was at High Falls in 1935, when a generator shaft broke. Although visiting experts insisted it would have to be replaced, at heavy expense and long delay, Jack maintained it could be repaired. He and his men fitted up a special rig to overcome the difficulty of having to do the job on the spot in very cramped quarters, drilled out the broken shaft, threaded the drill hole, screwed in a stud shaft, and let 'er go. The work was finished so precisely that the repair was perfect and is still giving satisfactory service. "I've got good men," he said when they asked him how it was done.

He's an Oddfellow, a Mason, member of the Quarter Century Club, member of the Board of Copper Cliff United Church. He is a member of Copper Cliff Town Council, and photographs taken when he was shaking hands with the King and Queen at Athletic Park last June disclosed that he can reach the heights of aldermanic dignity when the occasion warrants it. He is an ardent curling fan in winter, and in the summer he and Mrs. Garrow get great joy from their lovely place on Lake Ramsay.

He has acquired lasting fame as a practical joker, but none of his victims, not even the boarding house bear which he initiated into the joys and perils of the demon rum, has caught up with him yet.

★ ★ ★ TED DASH

Edward Charles Dash, better known as Ted to a wide circle of friends, is the tall, good-natured chief electrician at Garson Mine. A man not given to quibbling with destiny, he submitted peacefully to Triangle's camera-quiz, and answered almost all the questions with engaging frankness. You'll note that "almost."

He was born at Portsmouth, England, on November 9 of 1898, and remembers often watching as many as 20 battleships of the British fleet anchored off his home port. A favorite boyhood pastime was to

prowl around the old Victory, Nelson's flagship, which is still used at Portsmouth as a training ship for young lads who want to learn to shinny up the rigging.

In 1913 Ted came to Canada with his parents and sister, settling at Chesley in Bruce County, where his father went to work in the furniture factory. Ted topped off his schooling and then went to work in the factory too; when it switched over to the manufacture of munitions, he stuck around for a year, then enlisted in the 160th Bruce.

He went overseas as a private in September of 1917, saw action at Passchendaele among other spots, was on his feet and still a private at the end of the war. He at no time had any burning ambition to be an officer, and apparently the army had no burning ambition to make him one.

After the war he came home and started up in the electrical business at Chesley. From there, in 1929, he went to the Sault, and later came to Sudbury to juggle amps for Percy Morrison. In 1931 he signed with INCO at Copper Cliff, was transferred to Creighton, eventually moved to Garson in 1937.

He's single, likes the girls, but gave us the old evasive eye when pressed for a declaration of intentions. He sings a booming bass in St. Andrew's choir and is intensely fond of all kinds of music, from the much-belaboured Beer Barrel Polka to John Charles Thomas singing "None But the



"Lonely Heart" or Lily Pons in Lucia de Lammermore. For reading, give him Warwick Deeping—Old Pybus, Sorrel and Son, etc. He used to play the violin a good deal on Saturday afternoons, but eventually resigned in favor of Toscanini.

He lives at the Garson Club and takes an active part in community activities. He wouldn't trade an ounce of life for ten pounds of anything you can mention.

PROTECT ANESTHETICS

Some of the common anesthetics used today are nitrous oxide, ether and ethyl chloride diluted with various proportions of oxygen. Since these gases are corrosive, non-deteriorative materials must be used in the anesthetic apparatus. One manufacturer recently substituted pure nickel for another material in the construction of the valve seat of this apparatus.

Some Slants on Safety

To members of Sudbury Rotary Club on December 4 General Safety Engineer G. S. Jarrett gave a most informative address on "Accidents and Accident Prevention." Space does not permit complete reproduction of the paper, but Triangle gives here some pertinent paragraphs from it which will be of interest and value to all INCO employees:

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To be efficient, any large scale operation must be conducted with as much routine and as little interruption as possible and I can assure you that nothing can be more disturbing than the occurrence of an accident. The International Nickel Company accepts as axiomatic that there is one and only one right way of doing every operation, that is, the safest and most efficient way that can be devised, and it is found that the two ideals go hand in hand.

★ ★ ★

Human suffering is, of course, the most direct and most important effect of an accident, since it is seldom that the suffering ends with the injured workman himself. Financial compensation, no matter how generous it may be, can never make up for the loss of a loved one nor can the worry and nervous strain occasioned by an accident ever be reckoned in terms of dollars and cents.

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Since 1934, figures from the cost records show that The International Nickel Company has spent over \$568,000.00 as a direct charge against safety work. This represents an actual 5 year expenditure made up of installing and maintaining accident prevention features, plant alterations in line with safety recommendations, protective equipment issued free to employees and salaries of men engaged in accident prevention work. It is entirely free of all direct accident costs as represented by compensation assessments, of medical aid and of capital charges on new buildings or safety features built into new plants.

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On this basis it is reasonable to suggest that over a period of 10 years in which the Compensation Board has subsidized and otherwise assisted the whole of the mining industry in matters pertaining to safety to the extent of \$237,000.00, The International Nickel Company on its own behalf has spent in the neighbourhood of \$1,000,000.00.

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The Workmen's Compensation Act provides full medical aid, hospital and clinical service, within the requirements of any disability with the possibility of reopening a claim at any time and continuing treatment if such is required. It places at the disposal of injured workmen, the best skill and equipment in medicine and surgery available in the country. When a workman is totally disabled for a limited period of time, he is assured of compensation amounting to two-thirds of his average income at the time of the accident. Throughout his rehabilitation if it becomes necessary for him to accept work at a reduced rate of pay for a time, the Board will pay him two-thirds of the difference between his base rate and the reduced one. Where permanent disability is suffered whether it be total or partial the same provision is effective. It is usual for miners incapacitated for short periods to receive from \$20.00 to \$25.00 per week. In the case of a fatality, the widow is provided with a pension of \$40.00 per month for life or until remarriage with a wedding present if and when she remarries, equivalent to 2 years' pension. In addition the Board provides a widow with an allowance of \$10.00

per month for each child under the age of 16 years.

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Industry must provide all the money necessary to meet these liabilities together with the cost of administration of the Board. Assessment rates are struck annually for the various industrial classes and groups in proportion to their accident costs. In this way, a comparison of rates is to a degree a comparison of accident frequency and severity between classes.

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Over a period of 18 years from 1920 to 1937 the average mining rate was \$2.28 per \$100.00 of payroll. The fact that in 1938 this rate was \$1.75 indicates a marked improvement, particularly when you consider that amendments in the interval have made allowances to workmen and their dependents more generous. This cost in 1938 however, amounted to \$33.00 for each of the 30,000 men employed in the mining industry in Ontario or over \$1,100,000.00. Expressed in another way, every one of the 2,188 compensable injuries cost the mining industry on an average over \$500.00.

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In 1938 the frequency of compensable accidents in the mining and smelting division of The International Nickel Company can be expressed as 6.5 accidents per 100,000 shifts worked or 1 accident for every 15,385 shifts. On a basis of this frequency the average man in the industry might expect to work 51 years or somewhat more than a normal working lifetime with but one accident which would require his remaining away from work 7 days or more, or involve some permanent disability even as slight as the loss of a tooth.

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The comparison with other industries as indicated by assessment rates is interesting. The average assessment rate for the whole of the mining industry for 1938 was \$1.75 per \$100.00 of payroll. This was:

1. Considerably less than one-third of the rate for road and street making and repairing.
2. Slightly more than one-third of the rate paid by carpentry and general construction.
3. Exactly one-half of the rate paid by the painting, decorating and renovating industry.
4. Exactly the same as the rate for the warehousing and storage industry.

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It has long been realized that standardization of tools, materials and operations in any work tends toward efficiency. It was this idea coupled with the idea of safety rules that led to the development first at Frood and later at all other INCO plants, of codes which have come to be known as Standard Practices. The idea behind the scheme was from the outset one of combining safety and efficiency by developing as far as possible a correct way of performing every operation. Instead of compiling a list of "don'ts" into a handbook we have attempted to develop a text which we are prepared to change at any time a better means of obtaining an end has been proven.

With The International Nickel Company the safety idea has worked from the top down. Its most ardent exponents have always been those who direct the policy and accept the responsibility for production. As a result the Company has succeeded in instilling into its foremen the fact that their charge is both safety and production and that the safe way of approaching a problem is not

only the right way but usually the most efficient way.

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Looking at the records for the total Mining and Smelting Division the outstanding feature is that since 1930 the accident frequency has been reduced each year with the exception of 1935.

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In 1930 the Division experienced 590 compensable accidents and, expressed in terms of accidents per 100,000 man shifts worked, this was 34.8. In 1938, 163 accidents resulted in a rating of 6.50. This represents a reduction of 81% in accident frequency over the eight-year period.

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From annual reports of the Class 5 Accident Association, the following information of which we are justly proud is obtained: In 1937 the Mining and Smelting Division of The International Nickel Company had the third lowest accident frequency among the 65 major operations connected with the Ontario Mining Association with 30 accidents per 1,000 men employed. In 1938 the Division led the field with but 20 accidents per 1,000 men. It is also interesting to note that ORCO, taken as a separate unit for purposes of the Class 5 Accident report rated lowest in 1937 with 23, and 3rd in 1938 with 22 accidents per 1,000 men.

Ladies Active in Red Cross Society

With a registration of 1,000 eager and enthusiastic workers, including ladies of High Falls, Creighton and Levack, the Copper Cliff branch of the Red Cross Society has already made a big contribution to the nation's war effort.

Busy knitting needles, symbol of woman's strength in time of war, have plained and purled more than 500 articles of clothing which have been shipped to Red Cross headquarters for distribution, and about 1,000 items of hospital supplies have also been made up and sent away.

Much of the work is being done by the ladies at home, and the remainder is handled during the afternoons at Memorial Community Hall, where groups gather and put in busy but happy hours. The society has purchased four sewing machines to speed up its production.

At largely attended general meetings the society's committees report on their achievements, and members get a fuller perspective of what is being accomplished.

Sudbury Scored A Lasting Impression

The impression which Sudbury's reception of the King and Queen apparently made upon the people of England in general was reflected in an interesting letter from Maurice Colbourne, the eminent English stage star, to a correspondent in Copper Cliff.

Discussing a suggestion that he and Barry Jones bring one of their plays to Sudbury, Colbourne wrote, "It would be a pleasure to follow in H.M.'s footsteps and to play to an audience which we know would be very enthusiastic."

BEATS ABRASION

A special nickel cast iron is employed for cones, vanes—and for liners where extreme abrasion is encountered—in a dust collecting system developed by the Western Precipitation Corporation of Los Angeles. This collector system is used to salvage valuable materials dispersed by such operations as grinding, concentrating and smelting.



Christmas Entertainments Delighted Hundreds of Kiddies

An army of 2,000 kiddies took INCO Employees Club by storm Sunday afternoon and for five hours held undisputed possession of the big recreation centre. They were there in all sizes and ages, and all sorts of best bibs and tuckers, proudly escorted by mothers and fathers for the most exciting event on their annual calendar—their date with Santa Claus.

Frood Mine Welfare Association, their host for the afternoon, prepared long and carefully for them, and had a heap of no less than 1,700 presents ready for Santa and his helpers to distribute. Even that wasn't enough. Toward the end of the program it was seen that a further stock of gifts would have to be secured, and a truck was dispatched to a toy store which obligingly opened its doors to cope with the emergency.

Photos on the opposite page show a section of the huge crowd, a number of the kiddies as they passed through Santa's gift court on the stage of the auditorium, and some of the patient ones awaiting their turn. Each kiddie received a gift and a bag of fruit and candies.

Considering the size of the attendance and the excitement of the youngsters, the parade was handled with remarkable orderliness and speed, parents co-operating thoughtfully with those in charge.

Music was supplied during the afternoon by Paul Koster's orchestra and by the Lions Club Boys' Band.

The other big Christmas entertainment at the Club, that held by ORCO Security Association for the kiddies of its members, was staged with equal success on Wednesday. More than 600 delighted little guests received toys and treats. The smaller crowd made it possible for the ORCO welfare officials to inject more of a personal touch into the party, each gift package being tagged with the name of the child to whom it was presented.

For both events, as well as for other activities during the Yuletide season, the Club is beautifully decorated. Those in charge have excelled themselves in their arrangements, and it is hoped that every Club member will make a point of dropping in to see them.

Employees Club Orchestra



Koster Band Fine Music Unit

Top flight standing among district orchestras is conceded to Paul Koster's Employees' Club band, pictured here.

Organized when the Club was opened in the spring of 1938, the Koster unit settled down to earn music laurels, and has worked diligently at its rehearsals. Keeping on top of the hit parade, and choosing a happy medium in the style of its playing, not too hot and not too sweet, it soon won a big following which has increased steadily. It prefers to remain an exclusive Employees'

Club feature, a distinction which members of the Club appreciate. Its smooth melodies have often been broadcast over CKSO.

Standing at the left with baton is Maestro Paul himself, and the three saxophone artists are Eddie Cecchetto and Sid Phillips of Copper Cliff, and Conrad St. Marseille of Frood. The bass player is Wilf England of Falconbridge, the pianist Bennie Savoie of Frood, the drummer Jack Sigurdson of Frood. The two trumpet players are Bob Hill and Johnny Juryczak of Frood, and on their right is the wielder of the trombone, George Gibson, also of Frood.

The band is now working up a smart selection of numbers for the Employees' Club New Year's cabaret dance which swings into a three-hour stretch of fun and frolic at 12.15 a.m. January 1st.

Club Planning New Year Party

There'll be a great whirl of revelry New Year's Eve at INCO Employees' Club to usher in the infant 1940 and bid him godspeed on his hectic flight through this troubled world. Promptly at 12.15 a.m. of New Year's Day the fun will start, with Paul Koster's popular orchestra dispensing the syncopation to what is expected to be a record crowd. The reservations were pouring in to Seward George Barnett two weeks before the party, because it's to be a cabaret affair and tables will be in

Tickets have been on sale at the various plants for several days, since there will be naturally no opportunity of purchasing them the evening before the dance. High class novelties which everybody will want to keep as souvenirs of the occasion, will be distributed and special fun features are being arranged. Tickets are \$1.25 per couple.

Another highlight of the holiday season at the Club will be the band concert Sunday afternoon, December 24, from 5.00 to 5.30 o'clock by Dan Totino's Coniston Band. Their program will be broadcast from the Club over a CKSO hookup.

Basketball league scheduled games have been dropped for the holiday season, but badminton players are not letting down at all and are using every available hour.

Frood Tigers Make Big Bid

Back in junior "A" hockey after a year's absence, the Nickel Belt is being gamely represented this season by Frank Graham's Frood Tigers, who made a splendid bid for the Sportsmen's Patriotic Association Cup in their two-game, total-goal series with Toronto Native Sons.

In the first game, at Stanley Stadium December 15, the Tigers were trailing 5-2 going into the third period, but they fought back to a 5-4 tally. Valliancourt scored three goals in an impressive display, and George Blake of Coniston speared the fourth. In the second game at North Bay the next evening, the Tigers had the series all evened up at one stage, but Native Sons eventually eked out a 3-2 victory to take the trophy by a two-goal margin on the round. Valliancourt and Hamilton were Tigers scorers in the second match.

This is the team's lineup: Goal, Thompson; defence, Miles and Linton; centre, Blake; wings, Valliancourt and Anderson; alternates, Boluk, Keaney, McGinn, Hamilton, Kitt, Depew, Marinoff, Lemieux, Allard.

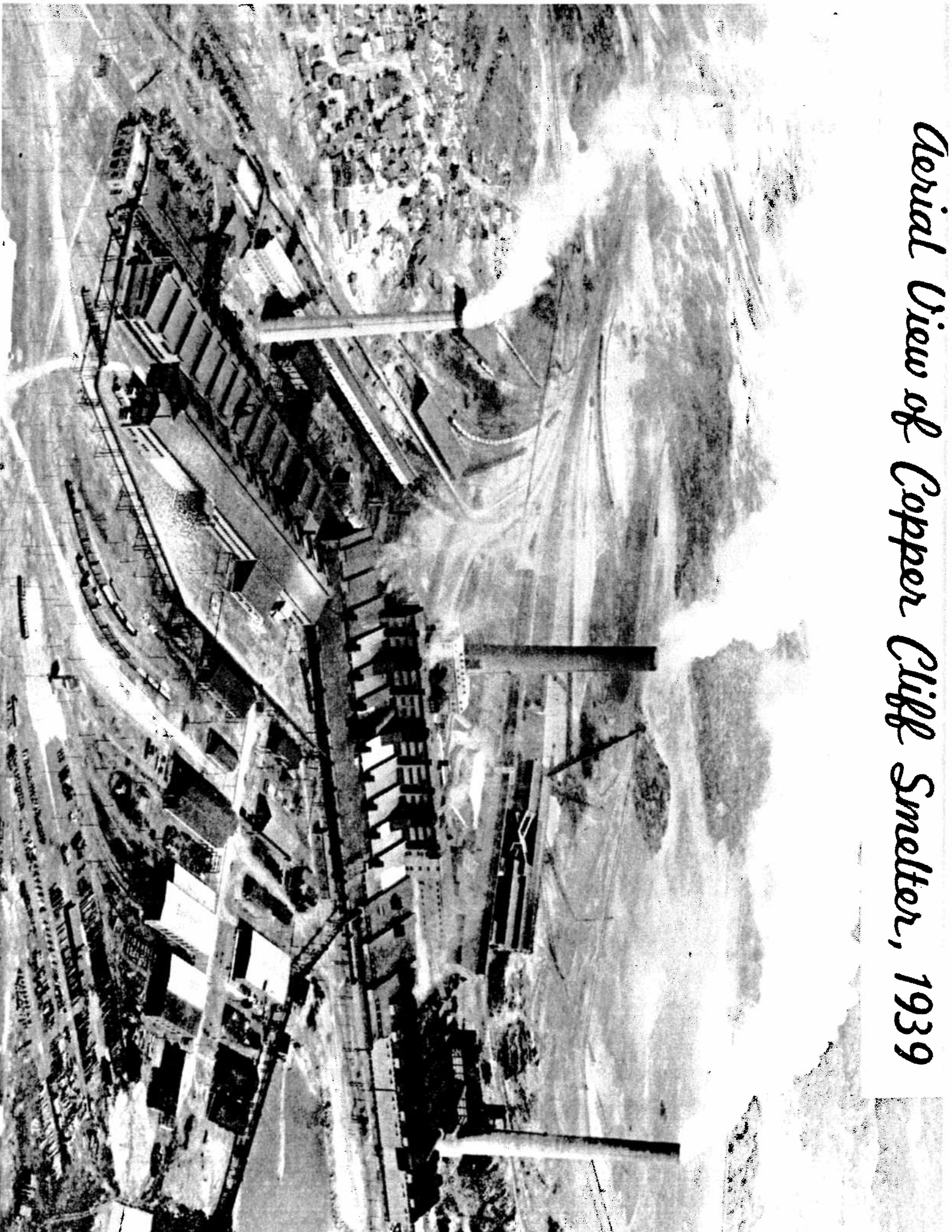
LONGER LIFE

The McNally Pittsburg Corporation, Pittsburg, Kansas, has adopted "Ni-Hard" for centrifugal sludge pumps used in connection with automatic coal washing equipment. Previously pumps had given short life due to the strong abrasive action of small coal particles. Use of Ni-Hard has prolonged the life of these pumps 500 to 800 per cent.

SOLVES PROBLEM

When tempered steel valve plates of an air compressor in a Pennsylvania coal mine broke every two to four weeks, replacements made of Inconel were installed. After one year of service—six months of which required 24-hour-a-day performance—the Inconel plates are still in excellent condition.

Aerial View of Copper Cliff Smelter, 1939



Mike's Proteges At Community Hall

When the word sped around last month that Hughie Craig had been wed, one of the first to extend congratulations was genial Mike Miller, talented C.C.A.A. mitt thrower and coach of the junior boxing class at Memorial Community Hall. Since Hughie was the originator of the Community Hall class for boys, Mike lost no time in inviting him down to one of the boxing sessions in order that some of his former pupils might wish him happiness. The camera caught Hughie and Mike with assistant-instructor Artie Wulff in the background, and a pile-up of the ring talent out of which may come someday a world champion.



General Office Gets Bridge Verdict

Frood Mine team, defending their trophy, were in the lead by several thousand points when the final evening's play commenced in the 1939 fall series of the semi-annual INCO inter-plant bridge tournament for the E. A. Collins Rose Bowl. But when the last finesse was made and the last trick was in, it was found that General Office had come from behind to annex the laurels by a close margin. Frood were puzzled when the total scores were announced, because their own tally showed many more points than they were credited with getting. Then it was found that one couple on the mine team lineup had made an error in marking their tally, whereby General Office got the benefit. Rules of the contest said the mistake had to be charged against those who made it, and that was that. It was a tough decision for the enthusiastic Froodians to lose, but they vowed there would be no mistake about the outcome next spring. By the same token General Office felt little real satisfaction in the award, and promised to make it more

convincing in the next set-to. Photo shows some of the members of the winning team: front row, left to right, R. McAndrew, Mrs. C. Beach, Mrs. T. J. Birney, C. Buck, Dr. R. B. Harris; back row, C. Beach, Bert Flynn, E. R. McGill, R. Gray. Absent were Mr. and Mrs. W. T. Waterbury, Dr. R. B. Robinson, W. Armstrong.



Final standing of the teams, and their scores for the three nights of play: General Office, 102,990; Frood Mine, 101,190; Smelter, 93,610; Creighton, 87,040; Research Lab, 85,260; Levack, 83,890; Garson, 82,390; Refinery, 82,010; INCO Club, 81,900; Outlaws, 81,350; Copper Cliff Ladies, 80,840; Frood Engineers, 76,360; Frood Tigers, 76,010; Wolves, 73,720.

Memorial Community Hall's engraved silver trays, awarded to the high aggregate couple in each series, went this time to Andy Spy and Jack Hughes of Frood Mine, whose total was 21,320. They're pictured here figuring out a new way of avoiding the rocks of distribution.

Cash prizes, given each evening to the five high-scoring couples, were again well distributed among the 14 teams, and apart from the unfortunate error affecting first place, the series was a thorough-going success once more. Scoring and arrangements were handled very capably by Leslie Ade and Ken McTavish.

BOTTLE HANDLES

An interesting use of Monel wire is for forming handles on large spring water bottles. Handles of other materials rusted or corroded from the strong chemicals used in washing the bottles before refilling. Monel has given satisfactory service in this application for several years.



Levack Gun Club Popular

A major activity at Levack since its organization last spring has been the Gun Club, a thriving group of some 50 lady and gent sharpshooters who have built themselves a complete layout for high-powered rifles, 22's, and skeet, and use every available opportunity to get the most value out of it. Officers of the Club are: C. H. Stewart, honorary president; Bill Humphreys, president; Bob Beggs, secretary-treasurer; Andy Baker, in charge of skeet; Jim Forbes, in charge of pistol shooting; Fred Thornton, in charge of rifle shooting.

Chicken and turkey shoots, a balloon shoot, and a running-deer shoot have been run off with great success. Some indication of the enthusiasm prevailing was seen at the running-deer shoot. The "deer" was fixed up on a wire so it could be pulled back and forth across the range while the "hunters" blazed away at it. One nimrod, apparently unable to get his sights on the elusive target, compromised by shooting the wire away and brought down his victim in that roundabout but nonetheless effective fashion.

Checking over a few targets and comparing prowess, these members of the Club were caught by the Triangle camera one sunny week-end: Left to right—Bill Humphreys, Casey Jones, Cliff Stewart, Foster Todd, Steve McIsaac, Miss Gwen Goldie, Fred Thornton and Herman Thompson.

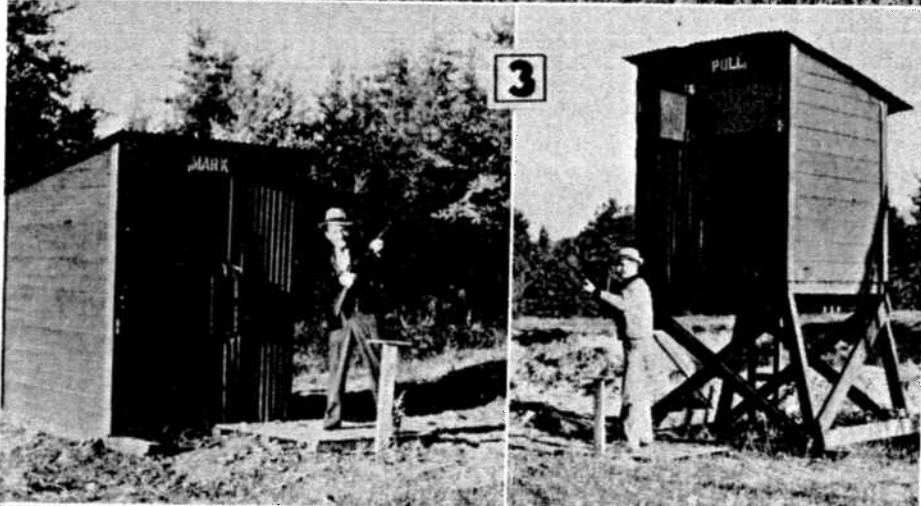
A stray enemy sub, happening to find itself facing such a battery as this, would probably throw its torpedoes away and dive straight down for an extended visit at the bottom. The Levack Club is fortunate in the keen interest taken by its lady members, a few of whom are seen here drawing bead on the bullseye: Left to right—Mrs. Vern Ritzel, Mrs. C. Jones, Mrs. McIsaac, Mrs. Humphries, Mrs. Todd and Mrs. Stewart.

Casey Jones stands ready for the shot at No. 7 station, in front of the mark trap of the skeet layout, and Foster Todd is shown in the other photo at No. 1 station in front of the pull trap. With second-hand lumber, the members erected these buildings themselves, and received a welcome donation of paint and netting for the backstops. They held raffles for half a dozen rifles, thereby not only raising money but also increasing the per capita gun coverage in the community. A shack originally built in 1918 by the Mond Athletic Association and more recently used as a changehouse for the hockey players, became available this fall and has been moved to the Gun Club's layout where it will be headquarters for shooting during the winter.

The Club is taking full advantage of the Dominion Marksmen competitions, and here are some of the awards received to date by its members: Mrs. Jones, silver medal; Mrs. Ritzel, bronze medal; Mrs. McIsaac, bronze medal; Mrs. Humphreys, silver medal; Mrs. Todd, bronze medal; Mrs. Stewart, bronze medal; Humphreys, silver medal; Jones, gold medal; Todd, silver medal; Stewart, gold medal and six spoons; McIsaac, silver medal; Thornton, gold medal.

At skeet shooting Stewart has had a couple of 25's, Baker a 22, Todd a 21 and Jones a 20.

Nickel tubes and tube sheets are used for a rayon hardening bath evaporator in a large southern rayon plant. The chief corrosive encountered is sulphuric acid. Under the vacuum conditions present, nickel has high corrosion resistance in addition to excellent heat transfer properties.





SUDBURY MINERS LOOM AS STRONG ALLEN CUP CONTENDER

Regarded as a strong contender for Allan Cup honors, particularly following their 6-1 drubbing of Toronto Goodyears at Stanley Stadium December 9, Sudbury Miners are pictured here with their coach and manager: Left to right, front row, Nap Carriere, Copper Cliff; Johnny McIntyre, Frood; Joe Stahan, Creighton; Tony Torti, Frood; Mel Carey, Creighton; Lloyd Grant, Frood; Vern Price, Coniston; Bill Sherry, Copper Cliff; Mickey McGlashen, Creighton; back row,

Tom Starkey, Creighton, manager; Reg Shields, Creighton; Shilly Shillington, Frood; Jim Dewey, Frood; Rosy Rozzini, Frood; Roy Heximer, Copper Cliff; Ab Conick, Frood; Earl Newbold, Creighton; Leo Sargent, Creighton; George Hastie, Falconbridge; Nick Nicholson, Creighton; Dillon Brady, Frood; Red Stuart, Frood.

Four wins and a tie in six starts was the Miners' record as Triangle went to press, and with every game the big machine improved noticeably in speed and polish.

In their opening encounter of the season the Miners played Baltimore Orioles to a 3-3 draw, and followed up the next week-end with an 8-2 win over Atlantic City Seagulls. When the highly-touted Lake Shore lineup visited Stanley Stadium, the Miners gave dopesters something to think about when they won 3-2 and then were beaten by only one goal in the return engagement up north. They turned back Buffalo-Ankerite 3-2, and hit a dizzy clip to squelch the travel-weary but nevertheless potent Goodyears.



ORCO MECHANICAL DEPARTMENT HOLDS THIRD ANNUAL DINNER-SOCIAL

Trophy-winners among the members of ORCO Mechanical Department received their awards at the organization's third annual dinner and social, held November 18 in the Nickel Range Hotel.

It was an attractive array of silverware that the Shops athletes acquired during the past year, no less than two INCO inter-plant championships being included in the presentations, which were as follows: F. Benard inter-department softball trophy, J. W. Gemmell inter-plant softball trophy, Security Association miniature cups, A. Welblund shield for department singles horseshoes to P. Boluk, J. C. Bischoff cup

for plant singles horseshoes to P. Boluk, L. F. Kitchener shield for department doubles horseshoes to P. Boluk and W. Keegan, R. H. Waddington cup for plant doubles horseshoes to P. Boluk and W. Keegan, R. D. Parker shield and medals for inter-plant First Aid, F. Benard shield for inter-department First Aid.

With the exception of H. J. "Punch" McDougall, captain of the Shops softball team, W. Keegan and Barney Graham, who were absent, the prize-winners lined up for a photograph as follows: back row, left to right: L. S. Quigg, softball; P. Boluk, softball and horseshoes; Elmer Baird, softball;

Howard Currie, softball; A. Watts, softball; Leo Desilets, softball; Bob Price, softball; Jerry Mahon, softball; Norman Dixon, softball; George Renaud, softball; Chester Bell, softball; seated, Ernest Bois, manager and coach of softball; W. Wickenden, First Aid; Morgan Shoveller, First Aid; J. B. Hunter, First Aid; D. H. Forster, First Aid; C. L. Mattini, First Aid; front, George Kuzney.

Dave Duncan's original poem, "The Blue Bell of Scotland and the Inca of Peru" was a highlight of the very enjoyable program, as was the brilliant boxing duel between George Black and Dynamite Skeriton. Morgan Shoveller was master of ceremonies.

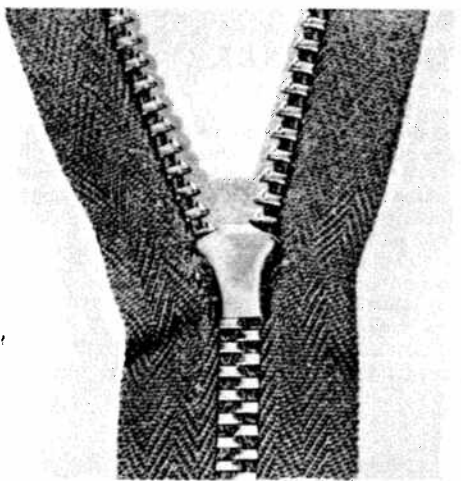
Gears of Fashion

Did you ever wear gears on your clothes?

You did if you have ever used the hookless fasteners, generally referred to as "zippers."

Basically, hookless fasteners consist of a series of individual wire teeth, or gears, threaded through a slide or cam. Moved in one direction this slide causes opposing teeth to mesh with one another and lock in place. Moved in the other, it frees, or opens them. Secret of the fastening motion lies in the fact that the teeth enter into mesh at an angle and lock as the movement of the cam straightens them. In unfastening, the reverse movement takes place.

Like all gears, the cam and teeth of the hookless fasteners are subject to wear and deformation and hence most of them are made of metal. Practically any metal which can be readily formed and assembled in automatic machines could be used provided



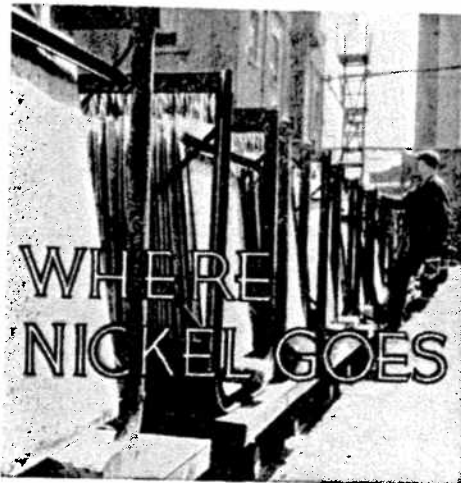
all danger of rust was absent. But the fasteners are used on bathing suits, gloves, and many other items of clothing, exposed to salt water, laundry compounds and dry-cleaning fluids. There are non-apparel items, also, such as tobacco pouches, curtains on modern Pullman sleepers, golf bags, brief cases, luggage and various industrial uses.

All these involve rust and corrosion by water, by perspiration from the hands, and other factors. Naturally, corrosion would adversely affect the wire teeth, weaken them and prevent the smooth sliding of the cam. In clothing there is the added menace of rusty stain. Rust protection is essential.

This protection has been afforded steel and other metals by a coating of one sort or another. More satisfactory, however, is the use of a solid rustproof material and one with sufficiently high mechanical properties to withstand abrasion, abuse, and natural exposure to deformation in service. Several metals have been tried, one of the more widely used being nickel silver, containing from 12 per cent to 20 per cent nickel. For certain industrial applications where exceptional resistance to corrosion is required, Monel sometimes is used.

Besides offering the necessary protection against rust, this alloy is strong and abrasion resistant. It is readily and easily formed and lends itself to large-scale production in automatic equipment. The alloy also furnishes an exceptionally satisfactory base for plating with precious metals where such a coating is desirable. If the plating does wear off the exposed base material is rustproof. Furthermore, nickel silver, especially when produced in the higher ranges of nickel content, offers a base to which the plating will adhere tightly and firmly.

Development of the fasteners represents

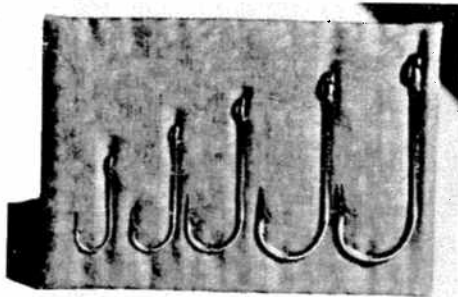


a pioneering struggle of almost a quarter of a century by the Hookless Fastener Company, now Talon, Inc., of Meadville, Pa.

Monel Fish Hooks

Heretofore, the angler has had to worry along with hooks that rusted, especially in salt water. The primary reason for this situation was that no corrosion-resistant hook was available which would offer—in addition to corrosion resistance—the necessary hardness, so that the point would remain sharp; stiffness, so that it would not bend; and a measure of ductility, so that it would give slightly without breaking.

Now "Z" Nickel hooks are being made available. They are made of an alloy containing approximately 98 per cent pure nickel and they have the corrosion resistance of nickel. Thus, they will withstand attack by salt, as well as fresh water. They also have mechanical properties which in the past have not been available in a rustproof metal. The alloy, which already has demonstrated its usefulness for many purposes, can be heat-treated to provide a strength and hardness equivalent to that of some of the



heat-treated alloy steels. At the same time, it retains an unusual degree of ductility, thus providing the spring-like qualities required.

Limited quantities of "Z" Nickel hooks already have been produced abroad. The present situation in Europe, however, has interfered with their commercial availability in Canada and the U.S. Now, however, sources of supply have been developed on this continent.

MONEL KEEPS CLEAN

To eliminate rust particles in chinaware clay mixtures which cause spotty discoloration in the finished product, Lenox, Incorporated, of Trenton, has lined steel cans, used to transport the clay mixture about the plant, with 20-gauge Monel sheet.

Magnets of Nickel

Chinaware and other pottery is susceptible to damage after it has passed all the way down the production line to the kilns, where it is baked, by the presence in the slip, or clay, of entrained iron oxides.

These swell in the kiln to many times their original size and result in rejection of the finished product. To avoid this waste of material and labor the oxide must be removed in the early stages of production.

Several methods were attempted before it was possible to accomplish this separation satisfactorily by passing the clay solution through a series of grids magnetized by an energizing coil. The grids are corrugated to present a maximum of magnetized surface.

Originally, these grids were made of galvanized or otherwise coated steel strips. It



was found, however, that the coating was soon worn off by the abrasive clay, thus exposing the steel, which rusted and added further contamination by iron oxide. To overcome this condition pure nickel strip was substituted.

Besides offering the required magnetic properties, nickel possesses high resistance to both corrosion and abrasion. Thus, the grids have exceptionally long life.

VETERAN TRUCK

Twenty-four years of continuous service is credited to a Mack truck owned by John H. Foley & Son, water well drillers of Utica, New York. In this time the truck has been in daily service carrying five tons of tools, pipes and drilling equipment throughout the upper part of New York state. The crankshaft, axles, connecting rods, and main drive bevel gear and pinion were forged from 3½ per cent nickel steel.

SAVES VALVES

The Crosby Steam Gauge and Valve Company uses forged nickel chromium steel for nozzles and disc inserts to insure continued tightness for safety valves. This material has proved best in resisting erosion from the high steam velocities which occur at the valve seats.

EMPLOY NICKEL

In equipping the new British plant of Catalin Limited, the company drew on the experience of the American company and employed pure nickel equipment for all reaction vessels, phenol storage tanks, portable vessels, piping and utensils.