

Within The

INCO TRIANGLE

VOLUME 1

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NUMBER 2

Prizes Are Awarded to Gardeners



Many Visitors at Copper Cliff

From all points of the compass come visitors to the INCO plant at Copper Cliff, the peak of the annual parade of sight-seers occurring during August.

Besides the hundreds from Sudbury and other Ontario points, the visitors' register from June 1 to October 1 showed guests from every province in Canada, from England, Scotland, China, Mexico, and Chile, and from the following 26 of the United States:

Michigan, New York, Indiana, New Jersey, Illinois, Ohio, Wisconsin, Oklahoma, Massachusetts, Kansas, Connecticut, West Virginia, Delaware, Maine, Maryland, North Carolina, Minnesota, Iowa, Washington, D.C., Pennsylvania, California, Texas, Montana, Vermont, South Dakota, and Florida.

IN COFFEE URNS

A new "visible" coffee urn has recently been put on the market, which shows coffee actually being made. The urn has an all-glass interior, and a brushed Monel Metal exterior.



Vimy Pilgrims

Few branches of the Canadian Legion sent as strong a delegation on the Vimy Pilgrimage as Copper Cliff, which staged a draw, got first-class support throughout the district for which it was sincerely appreciative, and was able to dispatch five of its members, selected by lot, on the six-week trip back to the Ridge where Canadians won immortality. Here was the party, left to right, standing: W. H. Barnicott, Fred Heale, Alec McGhee; seated: George Hart and Harry Cobbold. They returned the end of August with remarkable French accents. Another Copper Cliff Legionnaire, James Spalding, was a member of the official advance party which had charge of all arrangements, and had a two-month jaunt out of it.

COMMENDS THE WINNERS

Efforts of householders in Copper Cliff, Creighton, and Coniston to beautify their home surroundings were recognized again this year by INCO with the distribution of prizes to winners of the various classes in the annual lawn and garden competition.

Requesting Triangle to convey to the prize-winners his personal congratulations, Vice-President Donald MacAskill expressed his pleasure at the interest taken in improving home surroundings, not only by the prize-winners but by the majority of the householders.

Judging was done by Wm. C. Gardner, whose decisions were based not only on the merits of the lawns and gardens, but also on their location and the obstacles the householders may have had to overcome. The awards follow:

Class 1, Best Home Surroundings in Copper Cliff—1, David Hutchison, 33 Power St., \$20.00; 2, Robert Stevens, 36 Power St., \$15.00; 3, Harry Trotter, 1 Balsam St., \$10.00; 4, E. McKerrow, 13 Power St., \$8.00; 5, C. Lyons, 4 Kent St., \$7.00, and 27 others who received \$5.00 each.

Class 2, Best Kept Home Surroundings in Copper Cliff—1, John Thompson, 31 Power St., \$20.00; 2, Wm. Chisholm, 17 Rink St., \$15.00; 3, Wm. Zinkie, 6 Oliver St., \$10.00, and three others who received \$5.00 each.

Class 3, Most Improvements to Home Surroundings in Copper Cliff, 1936—1, R. H. Boehmer, 10 Granite St., \$20.00; 2, R. Chugg, 8a Peter St., \$15.00; Frank E. Wolfe, 28 Serpentine St., \$10.00, and six others who received \$5.00 each.

Class 4, Best Home Surroundings in Coniston—1, John Angove, 131 Balsam St., \$10.00, and three others who received \$5.00 each.

Class 5, Best Home Surroundings in Creighton—1, Ed. Myhill, 33 Lake St., \$10.00, and two others who received \$5.00 each.

WILL PRESENT NEW TROPHIES

The keen interest displayed by the men of INCO plants in First Aid work has resulted in the donation of five new trophies for competition, it is announced by G. S. Jarrett, General Safety Engineer.

At the conclusion of the regular First Aid classes toward the end of next February, inter-departmental contests will be staged at Creighton, Frood, Coniston and Copper Cliff. A trophy will be presented to the winning First Aid team in each plant. Although the names of the donors are not yet ready for release, both the Superintendent of Smelters and the Superintendent of Mines have assured the Safety Department that suitable trophies will be available.

Outstanding teams from each plant will then enter the final competition at Memorial Community Hall, and for this important event General Superintendent R. D. Parker has generously offered to donate a trophy to replace the John L. Agnew Shield which last spring was won permanently by Coniston.

Thus new pep is injected into the First Aid contests, and judging by the enthusiasm already expressed, Coniston will need be practically perfect to add another victory to its record of six straight triumphs.

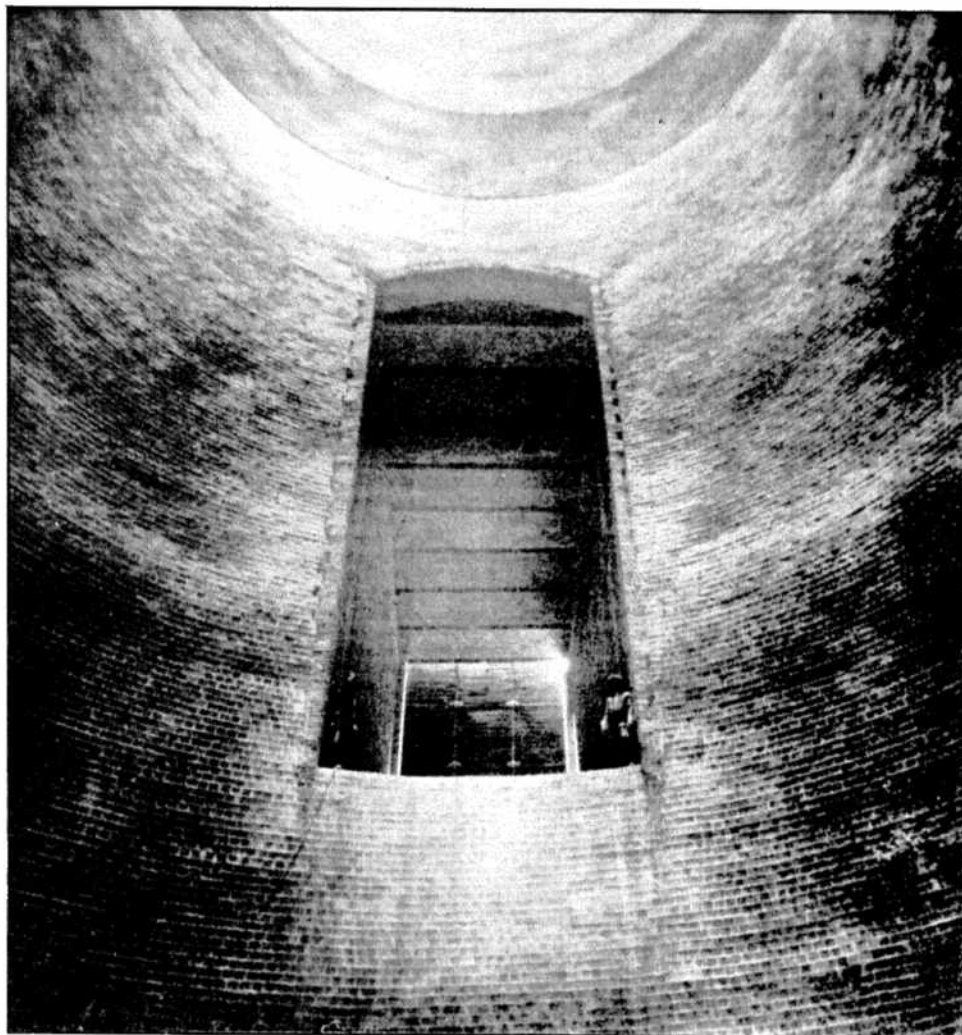
Francis Crean a Pioneer Prospector

A pioneer in the development of the Sudbury nickel mining industry, Francis Charles Crean died at Montreal, October 12, at the age of 87.

Five major nickel discoveries were credited to him: the Worthington, the Crean Hill, the Elsie, the Howland, and the Totten prospect.

He came to Canada as a boy from Hertfordshire, England, and is said to have commenced his active prospecting career in this district in 1884.

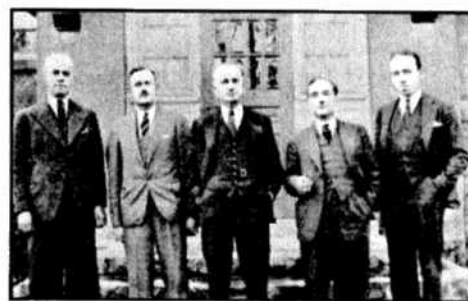
After leaving the Sudbury area he did considerable prospecting work in Quebec province, particularly on the Inner Labrador, where he maintained there were great mining possibilities.



Inside the New Stack

If that big opening were a cathedral window it would need more than 700 square feet of stained glass, would look down on floor space sufficient to provide comfortable seating accommodation for a congregation of 500 people. But it isn't a cathedral window, it's the flue opening in the wall of the new Copper Cliff stack, and those two fellows in the corners are by no means angels, they're workmen who helped Triangle's photographer get the shot. Through it will pass the smoke and gases belched from the copper division's furnaces on their way 500 feet up to the skies. Bottom of the opening is 21 feet from the floor; it's 18 feet wide, 40 feet high.

MILE OF RUBBER BELTING IN BIG ADDITION TO SMELTER



International

Three of the eight countries in which INCO operates one or more of its departments were represented in this international photo snapped at Copper Cliff Club October 10 by Triangle's photographer: Left to right, Cameron Whitehorse, New York, Deputy Comptroller; J. R. O'Donnell, Copper Cliff, Works Auditor; F. P. Bernhard, New York, Comptroller; R. A. R. Hill, London, Eng., Chief Accountant Mond Nickel Co. (INCO subsidiary since 1929), and A. Godfrey, Copper Cliff, Assistant Works Auditor. Of these five, Mr. Bernhard's INCO association is longest, 1899 to 1904, Copper Cliff; 1904 to 1908, Bayonne; 1908 to 1918, Copper Cliff; 1918 to 1922, Toronto; since then at New York. Mrs. Hill accompanied her husband on his visit. They crossed on the "Monarch of Alloys," the Queen Mary, and will visit INCO's rolling mills at Huntington, West Virginia, as well as the New York office of the Company. Mr. Hill was in Copper Cliff once before, in 1932.

Into the home stretch is construction of the addition to Copper Cliff smelter, major part of INCO's big 1936 expansion program which includes also extensive developments at Creighton Mine and at the Port Colborne and Copper Cliff refineries.

Working in close co-operation with the INCO engineering department, Fraser-Brace Limited are well within their construction schedule, expect to have the two reverberatory furnaces and seven converters of the new copper division brought into their circuit early in November, after a year of intensive activity.

Workmen have now put the finishing touches to the new concrete stack, the last stage being the paving of the dust hopper in the bottom with acid-resisting firebrick. Soaring 500 feet above its base, this latest pillar of INCO progress joins two other immense columns, stands ready to pass harmlessly into the heavens the smoke and gases of the copper division's furnaces.

Feeding this smoke and gas to the stack from the raging bellies of the reverberatory furnaces are the brick flues, also completed. From the furthest furnace to the stack the flue travels 400 feet, is 15 by 22 feet in its main section.

DRYING NEW REVERBS

Into each of the two new reverberatory furnaces has gone 240 tons of fine silica sand to form a bottom two feet thick, 110 feet long, 24 feet wide, and now drying-out fires are burning within them. This is the last stage before the furnaces are ready to receive their first charges of copper sulphides from the concentrator. The fires, which burn about 10 days, also serve the purpose of drying out the flues and the stack.

Elaborate but intricate, the electrical and conveyor hook-ups for the new plant are

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TELL TRIANGLE

Port Colborne

Many employees have asked your reporter to express their gratitude and appreciation for the week's vacation with pay that the Company has so generously extended to them this year. Among the many pleasures that this concession has permitted is the opportunity to visit with relatives and friends, some of whom they had not had the spare time to visit in years.

Bob Cochrane and Jerry Kuipers, of the machine shop, took advantage of the week's vacation to fulfill a long wished-for outing, and saw the World Series ball games. Jerry says that even being detained on account of mistaken identity didn't mar his fun one bit.

Fred Worobec and Stanley Shemansky returned from their vacation in Detroit by aeroplane to Buffalo, left Detroit at 1.30 p.m., arrived in Port Colborne at 3.30. When Fred was asked why he came back by 'plane, when he had a return railway ticket in his pocket, his reply was: "Well! I had to go in on the 4 to 12 shift, and you know what Nipper's like."

A very pretty wedding was solemnized on September 26 when Frances Stefanshen became the bride of Eugene Kowalsky. The week's vacation with pay added to the enjoyment of the honeymoon.

The boys in the machine shop are expecting that another wedding present will be in order if Tommy Jennings continues those week-end trips to Toronto.

Ed Cooke is on a business trip to Waterbury, Conn., to inspect a car of nickel. Charles (Bungy) Misener has asked him to be on the lookout for a couple of missing cooper hammers.

Fred Davies, local heavyweight wrestler and boxer, is said to be on the lookout for a football helmet with air cushions.

Doug. Runyon, box maker deluxe and star shot on the Sailors' hockey team, has proved his marksmanship at duck hunting. Tame or not, they're all duck soup for Doug.



Perennial and efficient secretary of the INCO A. A., V. A. Lynden won the INCO golf championship, overcame such worthy opponents as W. J. Freeman Jr. and H. P. Roe. The latter had previously disposed of a formidable competitor in Glenn Winger. Roe carried the final match at Cherry Hill to the 21st hole before succumbing. Lynden also holds the record for number of games played this season, 120—can you beat it? Snap shows Roe (left) and Lynden on the final green.

The John More handicap cup was won by Jas. F. Ross, of the accounting department. H. W. Walter was the runner up in this event. Three strokes handicap proved too much for him, but he carried the game to the 19th hole, and we don't mean the locker room.

Frank Chalmers has been elected chairman of the INCO Bowling League; with him on the committee are Alex. Herrick, J. F. Ross and E. C. Lambert. Both five and ten-pin leagues are being organized. It is expected there will be 12 teams in the ten-pin league and 10 teams in the five-pin league.

Coniston

Local fans who gave moral and vocal support to the Coniston girls' basketball team in the provincial finals at Toronto October 9, were: Mr. and Mrs. Sid Smith, Mat Blake, Demetri Hladki, Jerry Carry, Carlo Chezzle, Bert Benadetti, Tony Padhajney and Carrol Nesbit.

On the road to recovery: Joseph Houle, after an attack of pneumonia; James Spencer, after an operation in Toronto General Hospital.

Future softball stars: to Mr. and Mrs. G. Vlau, October 2, a daughter; to Mr. and Mrs. N. Vallancourt, October 5, a daughter; to Mr. and Mrs. Lionel Lalonde, October 7, a daughter; to Mr. and Mrs. W. Collins, October 9, a daughter; to Mr. and Mrs. Dan Forstall, October 2, a daughter.

Future hockey stars: to Mr. and Mrs. S. Floriani, October 7, a son; to Mr. and Mrs. Jack Creswell, October 10, a son; to

Mr. and Mrs. Armondo Brignol, October 12, a son.

Watchman and weather-prophet since 1933, John Dale took a vacation, returned to find things topsy-turvy without his daily bulletins on climatic conditions. Even the policemen were out of step, with their winter coats on. Jack and his feline accomplice, Ginger, have things back on an even keel, police coats back in mothballs, promise to forecast a week in advance when vacation time comes next year.

Wed, at Coniston, October 12, Leonard Pilon and Maria Gosselin. Ceremony performed at the Roman Catholic Church by Rev. J. H. Bruneau.

The Smelter League is getting ready for a red-hot season. Stevenson's Shift, last year's champs, have ordered striking new uniforms, and their opponents are advised to figure out some anti-dazzle device.

Good news is word of the steady improvement of W. A. MacDonell, who has been indisposed for some time.

Copper Cliff

Evening of October 14 Mr. and Mrs. J. Sime played bridge with Mr. and Mrs. Cleo, of Creighton Mine, scored high for Copper Cliff when Mrs. Sime picked up a hand containing 13 hearts.

Mrs. H. Spalding and two sons went to Montreal for what they planned as a week's visit, but all three contracted scarlet fever, and didn't get home until October 10, after more than two months' convalescence. Were they welcome!

Little Virginia Digby, aged 4, picked up a purse on the way home from the post office October 15 with her dad who, scarcely noticing, prompted her to throw it away. Virginia, womanly wise, hung on to it, and at home pulled from it \$31 and an expensive wrist watch. Through the police office the purse was returned to an anxious owner, whose infant had nonchalantly tossed it from the baby carriage while its mother was in the post office.

Wed, at Sudbury, September 24, Charles Purcell and Ella Allen, of Monetville; at Sudbury, September 27, Rene Belaire and Eveline Beaulieu, of Sudbury; at Westport, September 7, M. Barry and Frances O'Hara, who honeymooned to Philadelphia.

Born, to Mr. and Mrs. J. H. Frennel, September 27, a daughter; to Mr. and Mrs. Arthur Laframboise, September 13, a daughter, Rose Mary; to Mr. and Mrs. Gerald Bennett, September 25, a daughter.

Long-distance holiday travellers were D. Ritchie, back September 24 from a trip to New York, and Wilbur McDonald, who visited his home at Crystal City, Man.

Uncle Ezzy and his International Barn Dance Unit practically stopped the show at the INCO Amateur Night program in August attended by President Stanley. Since then they've become a CKSO radio feature Tuesday evenings, and now they're open for concert engagements. Director and Uncle Ezzy combined is E. Farrell; business manager is G. Brown; other members of the troupe—Pat Heaphy, first fiddle; Lorne Jarvis, second fiddle; Bud Langille, piano; Andy Kanerva, singing guitar; Victor Romano, Spanish guitar; Joe Rossi, mouth organ; Charlie Sturrock, string bass; Bill and Stan Townsend, yodelling cowboys.

Smeltermen seem to find either their resistance lowest or their ambition highest in September, whichever way you look at marriages. It's a big Cupid month: September 26, Tony Pavato to Lena Cirantola; John Boyuk to Julie Karhaewich; September 30, Gordon Turner to Eileen Bruton; September 29, Veda Beale, of Altamont, Man., to Albert Morin, and Anna Blaise, of Rose Isle, Man., to Emile Charbonneau; October 7, A. Severin to Annie Bruton, of Sturgeon Falls.

Perhaps Jack Cogan found holidays didn't agree with him. At any rate he got his dates mixed up, landed back on the job one day too soon.

Martin Serenak is still collecting congratulations on the healthy twins which were born July 17. More recent arrivals—to Mr. and Mrs. Melville McEwen, October 2, a daughter; to Mr. and Mrs. Bedarde, October 8, a son; to Mr. and Mrs. Pat Gallagher, September 23, a daughter.

Fairbanks Lake waters ebbed noticeably when Dave Aubin and Denis Jodouin yanked out a salmon trout measuring 38 inches long, girth of 24 inches, weight of 24 pounds 12 ounces.

Reverb men chortled at accounts of a hunting expedition at White Water Lake during which Paddy McLaughlin and Dan Salhani didn't get wet enough in the rain, so plopped into the drink with their clothes on. The duck call reverberates along the reverb line continually these days. Another dyed-in-the-wool hunter is W. Wright, and bill collectors are advised to take to the marshes if they would find Jesse Morrison on his day off. Bob McInnes excitedly drew a bead on a fat flock, shut his eyes and pressed the trigger . . . found he'd forgotten shells.

A former sailor on the St. Lawrence, Archie Organ, will soon complete construction of a boat he started to build a month ago. He'll launch it on Ramsay Lake at his summer camp in the South bay. Also looking forward to next summer is R. M.

Cameron, who has bought an island in White Fish bay next to Birch Island at Manitoulin, and will build a camp.

Reverb romances recently altared: E. DesRochers, on July 25, to Lisa Lahti, of the Soo; Mario Tarrini to Ada Valentini on July 25; Ken Bourne, on July 25, to Edith Coombs; Frederick Bruce to Margaret Giguere, at Toronto; E. A. "Mickey" McFadden to Dorothea Hudson, of Lindsay, at Toronto September 23, honeymoon to Ste. Anne de Beaupre; Jack Haldershaw, of Dauphin, Man., to Ilene Ploschak, of Ste. Rose, Man., October 15.

Recent-benedict Mel Edwards, wed at North Bay to Margaret McLeod, walked into his home to find a snappy new bookcase awaiting him, surprise gift of his pals on the Bowman shift at the mill.

Further serious losses to the ranks of the single hold-outs were the marriages of John Fraser and Gordon Gray, and of E. O. Lair, on October 7, to Bernadette Mainville, at Chapeau.

Mr. and Mrs. E. Crouse welcomed little Dorothy Jean on September 17; Mr. and Mrs. Fred McIntyre extended the glad hand to nine-pound Marion Gail on September 5.

Wiggy Walmsley, Jerry Pappin, and Bob Deacon looked 'em over at the World Series in New York, stopped in Toronto on the way back to see the Dominion lacrosse finals and also the showdown for the provincial women's softball championship, Jerry insisting on the latter.

Herb Surrey is back on the job after a long absence. Following an August operation, his doc prescribed Georgian Bay atmosphere for convalescence. Herb, not averse, made Little Current his mending headquarters.

Only 27 days after he started work in the mill, Sam Pitchford had a holiday trip back to his native heath on the prairies. It was a free ride, too, Sam's evidence being needed in a court case. Now he's back and hoping there's need of a first-class witness in the south of France, or maybe Switzerland.

Through this medium the boys on the Boehmer shift extend sincere sympathy to Mr. and Mrs. Fred Gainon in the loss of their baby daughter.



Realizing there might be some doubting Thomases among his fellow workmen, Cameron Shortts brought back convincing snapshots from his keenly enjoyed vacation at Napanee. He had some real sport on Mud Lake, came up smiling after an accidental dunking in its frigid waters at 6 a.m. while establishing a blind. Here he is with a few mallards.

This week Willard Ramsay, crushing plant star defenceman of last winter, is to take unto himself a wife, will in future confine his spectacular rushes to the basement stairs. Recently he picked up a bit of valuable experience by travelling half a mile in his car without tire or rim.

One for the book was the expression on Jim Parlee's face when he discovered a snake in his lunch pail recently. The cold snap is apparently driving wild life to shelter, but the reptile could hardly have chosen a more cheerless spot than Parlee's lunch pail after lunch.

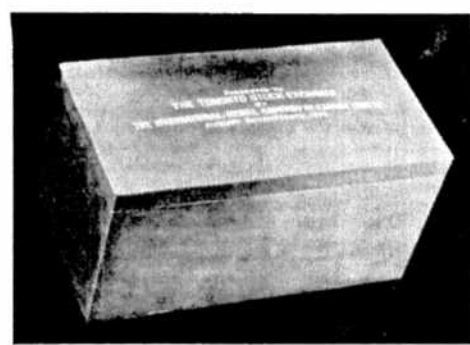
The quick freeze-up cost Steve Fajacz a new radiator, froze a gas-line for Arthur Whistle so he had to suffer the indignity of being towed to town in his new buggy.



Now legend around the concentrator is the mess of beautiful trout hauled in this summer by Harold Talbot and Jim Parlee. And thereby hangs a tale—a deer's tail, to be exact. Here is the hunter (Bob Boehmer), who shot the deer (see above) that furnished the tail (also see above) that made the flies, that caught the trout, that filled the creel of Harold and Jim.

EXCHANGE: Anyone furnishing a deer tail this fall will receive a fine trout next summer. Phone Copper Cliff 450.

With D.D.G.M. Wm. Card assisted by a degree team from Chapeau, Copper Cliff, and Sudbury, Nickel Lodge I.O.O.F. October 12 saw the following officers installed:



For Posterity

An engraved casket of pure nickel, mined in Sudbury Basin, smelted at Copper Cliff, and refined electrolytically at Port Colborne, which was placed under the cornerstone of the new Toronto Stock Exchange building at a special ceremony on August 17, 1936. Presented by INCO, the casket contains documents, copies of newspapers, records, and a Canadian silver dollar.

Noble Grand, A. B. Johnstone; Vice-Grand, G. Corf; Recording Secretary, A. J. Simmons, P.G.; Financial Secretary, G. D. McLaren, P.G.; Treasurer, G. M. Ferguson, P.G.; R.S.N.G., A. Hughes, P.G.; L.S.N.G., K. Madil; Chaplain, J. Gilpin, P.G.; Warden, B. C. Johnston; R.S.S., P. A. Germa; L.S.S., E. Cunningham; I.G., G. H. Hart; O.G., J. Tincombe; R.S.V.G., G. Gilpin; L.S.V.G., G. Hoddy. Lunch was served by Garnet Rebekah Lodge.

Henry Latinville clicked the mutual draws October 9 for a 10-spot, smilingly admitted this runs his total up to \$75.

"Mac" McCracken's holiday was a fishing trip, during which he once got tired waiting for bites, toppled into the lake to get to closer grips with the elusive trout.

Mrs. Y. Vesanan has returned from a three months' holiday to Finland, reports conditions good there.

Gordon Stone started something when he wed Isabelle Nodwell, of Callander, on October 14, 1933. Since that time a matrimonial epidemic has ravaged the machine shop, swept it almost clean of eligible young bachelors. Here's how they fell: November 30, 1933, Noel Shrigley to Hilda Gifford, of Sudbury; May 18, 1934, Fred Lumley to May Death, of Copper Cliff; May 27, 1934, A. Mikkalo to Elsie Niemi, of Naughton; August 26, 1934, George Doan to Anna Lindsay, of Gourock, Scotland; November 1, 1934, Clarence Hobden to Patricia Perring, of Frood; June 6, 1935, James Metcalfe to Isobel Graham, of Aylmer; June 29, 1935, Robert Rodgers to Violet Goodman, of Sault Ste. Marie; July 19, 1935, Ralph Stevens to Mildred Dresser, of Anyox, B.C.; August 30, 1935, Ivan Fraser to Emily Fensom, of Sudbury; February 29, 1936, Robert Tweddle to Nora Salmond, of Hamilton; June 10, 1936, Mervin Zinkie to Olive Wilson, of Copper Cliff; September 1, 1936, George Hildebrandt to Lillian Wuori, of Copper Cliff; September 14, 1936, John Clark to Margaret Mills, of Toronto. And now, to cap matters, Victor Burns returned from vacation in a bewildered frame of mind, starting making cautious inquiries about the high-cost-of-living-for-two.

Infant Incoites: to Mr. and Mrs. Red Porter, October 11, a son; to Mr. and Mrs. George Ferguson, September 30, a daughter; to Mr. and Mrs. George Carleton, September 26, a daughter.

Mrs. Alex. Salo and daughter have returned from an extended holiday visit with relatives in Finland.

Morning after morning Bill Alder thrilled warehouse cronies with threats of what he would do to a certain black bear making free with his summer camp at Black Lake. Eventually, with a companion, Bill met the bear. Was it such a terrible experience for Bruin? Bill and his pal scaled cliffs, leaped babbling brooks, reached home in nothing flat to flop into bunks like spent marathoners. But the bear hasn't been seen around them that parts since.

R. A. Elliott is president, and R. D. Parker and D. Finlayson are executive members of the Nickel Belt Motor League, 1936.

Friends of Miss Edna Browne surprised her September 30 at Copper Cliff Club with a "shower" of kitchen things for her new home in the York Apartments.

At Copper Cliff Club the bowling season is in full swing, tournaments drawing large and enthusiastic entries. At Memorial Community Hall badminton is underway, under supervision of a committee consisting of Foster Todd, Frood, and Mrs. S. A. Crandall and Ed. McGill, of Copper Cliff. The

(Continued on Page 6)

Dancing Pumps Hardly the Thing

Safety boots may not rate much space in Esquire, or other authorities on what the smartly dressed man should wear, but a pair of patent leather dancing pumps would have been scant satisfaction to a Creighton grizzlyman last February.

He was assisting a fellow workman in barring a chunk of rock through the grizzly when another large chunk lying beside his left foot moved, jamming his foot against the grizzly bar, and fracturing the great toe.

Had he not been wearing safety boots which were in good condition, the injury would have been much more serious.



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EDITORIAL OFFICE COPPER CLIFF, ONT.
Don M. Dunbar, Editor

VOL. 1, No. 2

NOVEMBER, 1936

Protection

Of the 324 INCO employees residing in the Sudbury District who have passed in death or suffered total disability since 1918, a total of 270 carried the low-rate Group Insurance made available to them by the Company, and thereby assisted their families to the extent of \$700,000.00.

This low-rate insurance can be obtained by any INCO employee who, when he secures it, rests content that he has not only arranged financially for his family after his death, but has also made certain they will receive friendly and helpful advice concerning the many troubles and problems facing them.

This unusual latter feature of INCO's Group Insurance plan involves no expense to those who receive it, and has brought many unsolicited letters of deep appreciation from bereaved families who, bewildered in their sorrow, were able to face the future with confidence and security after the Company's Insurance Department had straightened out their affairs for them, protected them from unhappy mistakes.

From time to time Triangle will print details of these cases, to acquaint INCO employees with what is being done. Here is one story:

This man died at the age of 33. He left a wife and three young children. The Group Insurance which he held was practically the only asset belonging to his estate. After interviewing his wife, it was found that she desired to move from the district and live close to her family connections. The children ranged in age from two to six years. Sufficient money was paid to her from her Group Insurance to pay off current liabilities. The department then advised her to make application to The Mothers' Allowances Board for compensation from them, and also negotiated with this Board with the view of spreading over the monthly payments from her insurance fund which, together with the allowance granted her by the Mothers' Allowances Board, would ensure her with sufficient funds for respectable living for her family until such time as the children would be able to earn some money and assist her. The department was successful in its negotiations with the Mothers' Allowances Board and as a result it was arranged that this mother will receive a sufficient guaranteed income over a period of 15 years. At the expiration of this time her children will then have attained sufficient age to look after themselves and also be able to assist their mother.

Pleasure

A good way to measure the value of the various INCO athletic associations is to realize how dull our leisure hours would be without them. Consideration of the many splendid activities which are carried on, the valuable advantages which are offered, and the small dues collected for this service, leaves the feeling that the athletic associations are entitled to unanimous and enthusiastic support.

In every season of the year the athletic associations are on the job, organizing activities for INCO employees. Baseball, football, tennis, softball, badminton, and hockey are some of the assignments they handle cheerfully and effectively. One outstanding opportunity of which hundreds avail themselves at this season is alone worth the membership fee—a member of any INCO athletic association in required good standing can obtain at the Stadium a season's skating ticket for his entire family for only two dollars.

Officers, executives, and hard-working committees of these associations do a great deal of voluntary work for which they receive comparatively little recognition. Here are the men directing athletic welfare in the INCO plants at present:

Coniston—Chairman, W. Bray; vice-chairman, F. Stevenson; secretary-treasurer, G. L. Rogerson; executives: baseball, W. Burns; softball, W. Blake; hockey, O. Mulvihill; tennis, Rev. A. P. S. Addison; general, E. Bray, P. Johnson, G. Geoffrey.

Creighton—Chairman, B. F. Crandall; secretary-treasurer, W. C. McAllen; executives: hockey, J. B. Fyfe; baseball, A. R. Clarke.

Frood—Chairman, F. J. Eager; vice-chairman, A. F. Brock; secretary, E. Gladman; treasurer, G. Soucie; executives: hockey, H. Towns; softball, W. S. Schinbein; football, Jack Cullen; baseball, Chas. Sheehan; finance, A. F. Brock, C. H. Stuart, G. Soucie.

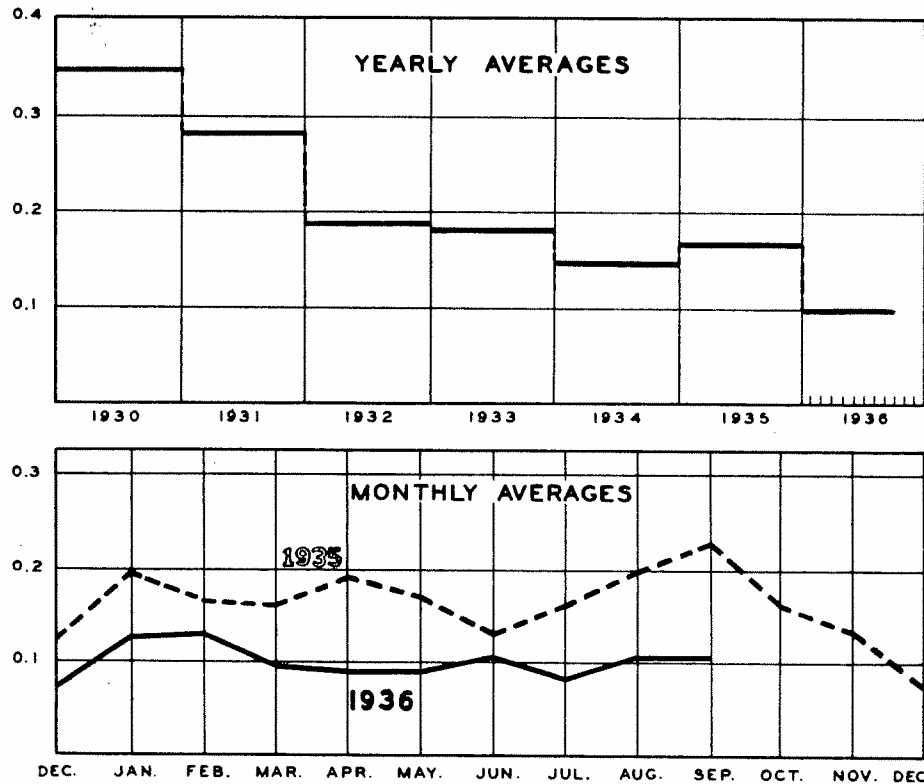
Copper Cliff—Chairman, J. W. Garrow; vice-chairman, W. E. Gillespie; secretary, A. E. Cave; treasurer, R. E. Henderson. Executive chairmen have not yet been named for the ensuing year.

Refinery—Honorary chairman, F. Benard; honorary vice-chairman, G. A. McFarlane; chairman, R. H. Waddington; vice-chairman, J. C. Bischoff; secretary-treasurer, J. A. Grimes; executives: F. Sheridan, H. Kurtz, H. B. Shoveller, F. Eplett, G. Furchner, J. Moss.

Port Colborne—President, W. J. Freeman; vice-president, James H. Walter; secretary-treasurer, V. A. Lynden.

TRIANGLE'S INDEX OF ACCIDENT FREQUENCY

PER 1000 SHIFTS WORKED



"How are we doing?"

"How are we doing?" ... That's a question which must often pop up in the minds of safety-minded INCO employees, who wonder how their current safety record compares with that for previous periods. So Triangle starts another regular feature—its Index to Accident Frequency, which shows the average number of accidents per 1,000 shifts worked for the entire Mining and Smelting Division of INCO over comparative periods. Example: from the top half of the chart you'll see that in 1932 there were .18 accidents for each 1,000 shifts worked throughout the year, and that in 1936 to the end of September the co-operation of all employees has creditably reduced this figure to .08 accidents per 1,000 shifts. In the bottom half of the chart you'll see that in April of 1936 there were .08 accidents per 1,000 shifts worked—a substantial reduction from the record of 1.84 for April of 1935. Now you can check up on "How are we doing." Watch Triangle's Index of Accident Frequency, and do your bit to keep those black lines down.

NICKEL ... AND ITS USES

NICKEL IN THE HOME

.... it unlocks the front door, it dolls up the kitchen, it holds your toothbrush together but read for yourself about this Versatile Servant

The nickel which we spend our days in mining, concentrating, smelting and refining spreads to all parts of the civilized world and enters the daily life of the average householder in far more ways than we probably recognize. In the preparation of foods and beverages, in the production of gasoline for motor cars, in the construction of those cars and of other types of transportation, in communication, electrical and chemical industries and in a thousand and one other ways it contributes to the comfort and convenience of civilized people. Many of its uses are unseen and unnoticed, but in no way does it come so intimately in contact with every day existence as in the many applications nickel has in the home.

NICKEL IS THE KEY

Take for example the key with which you unlock the front door of your house. It is the symbol of the security of the home. With it a man enters his "castle" and with it he shuts out intruders. The chances are that that key is made of nickel silver, a strong, rustless alloy which contains from 10 to 30 per cent. of nickel and which owes its appearance and much of its usefulness to its nickel content. And the same is true of the key to your automobile.

These keys suggest the key to the reasons why nickel is such a valuable material in the home. When nickel is mixed with other metals it has a remarkable ability to impart its white color and other properties to these metallic combinations or alloys. Nickel is strong and sturdy, and can be used to increase the strength and durability of iron, steel, and other metals. Nickel resists corrosion; rust and other destructive forms of corrosion have a hard time attacking nickel and any alloys of which it is a part. Finally, nickel has several curious and valuable qualities which make it useful for a variety of special purposes. For example, it is used in powerful magnets, in the heating elements of electric heating devices and in the thermostatic controls used in heating systems as well as in automobiles.

Hence nickel has come to be called, "Your Versatile Servant." It can do so many things and do them well, that it really is a servant of mankind and deserves this name.

CHINESE HAD IDEA

As a servant in the home, nickel is no newcomer. Before the development of nickel silver a century or so ago, the ancient Chinese alloy, Pakong, which was similar to nickel silver, was highly prized in Europe for its beauty. It was used to make firecreens and many other, smaller ornamental objects. After the development of nickel silver, tableware (knives, forks and spoons) made of this material became

popular and has remained so to this day. Silver-plating upon nickel silver provides the material for some of the handsomest tableware manufactured today.

Nickel-plating, developed about the same time as nickel silver, eventually became the best known use for nickel in the home, though it is now being replaced by other uses of the metal. Nickel-plated plumbing and ornamental fixtures were widely used a generation ago, and even with the recent introduction of chromium-plating, nickel has not lost its usefulness. Standard practice for chromium-plating requires a nickel underplating much thicker than the chromium surface.

The more modern trend in the use of nickel in the home is best illustrated in the kitchen, where Monel, the famous natural Canadian nickel-copper alloy, is helping to introduce brightness and color and to ease the labors of the housewife. Monel is used for table tops, tops for electric and gas ranges, for sinks and ventilator hoods and for other accessory equipment because Monel is a handsome, silvery metal, which is strong and will not rust, corrode or dent easily. Monel lasts indefinitely; in fact, its appearance actually improves with use. The resiliency of its surface makes it easy on dishes and reduces clatter, and, since it resists

tarnish and staining, it is easy to keep clean.

BEAUTIFYING KITCHENS

Home experts and kitchen designers attribute much of the progress in one of the most recent trends in kitchen beautification to the use of Monel. Monel, they say, harmonizes with and sets off all colors to advantage. Hence the presence of Monel working surfaces assists in making the kitchen one of the pleasantest rooms in the house. In planning kitchens to eliminate unnecessary steps, Monel equipment is also doing its part. Such recent developments as the Monel sink which rests on a metal cabinet fitted with drawers and racks and the new unit system cabinets, many of which have Monel tops, are a step in the direction of efficiency. The cabinets are designed either to rest on the floor or to hang on walls. They can be located in the most convenient places, and, being of standard design, can be added to as needed.

The resistance of Monel to rust makes it an excellent material for tanks in the hot water system. Forward-looking homeowners are coming more and more to realize the two great advantages of Monel tanks: First, they do not rust and cannot discolor the water. Second, they will last a lifetime. Hence they are both a sanitary and economical addition to home equipment.

POCKETBOOK BOON

In the modern home, electrical heating devices—stoves, flatirons, toasters, coffee percolators, waffle irons and a dozen other useful items—are coming more and more into the picture. Here nickel lends its services in a way seldom appreciated by the average householder, for nickel made it possible to bring heating devices of this kind within the limits of the average pocketbook. Until about 30 years ago platinum was the only metal known which could be relied upon to create heat through electrical resistance without burning out quickly. The development of nickel-chromium alloys makes it unnecessary to use rare and costly platinum for this purpose.

If nickel helps produce heat, it also helps produce cold, for a thermostatic control containing nickel keeps the electric refrigerator at the proper temperature. On the other hand, another thermostatic device, also containing nickel, controls the automatic furnace or oil heater.

A good deal of small household machinery, for example that which motivates the washing machine, has gears, cams, connecting rods and other similar small parts made of nickel alloy cast irons. Washing machines are also made with Monel tubs to prevent rust spots and stains, which corrosion of other metals might cause.

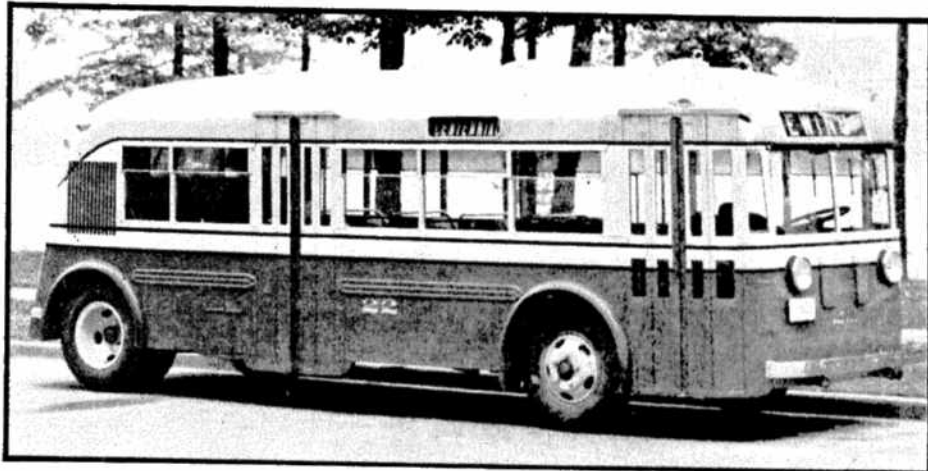
These different uses of nickel in the home shed some light on why nickel is called a versatile servant. Nickel, moreover, actually does help shed light in the home, for all electric light bulbs contain nickel, and nickel is used in various other parts of the electrical system.

FOR ENTERTAINMENT

Nickel not only helps do the work around the house, it helps provide entertainment when it is time to relax. Take the radio, for instance. Metal parts in the radio tube are either made of nickel or contain nickel as an essential ingredient. And it is fair to say that nickel made possible radio broadcasting and reception as it is known today. The telephone also has nickel parts.

Various ways in which nickel helps to beautify the home have already been mentioned. To them might be added such things as nickel-silver door handles, lighting fixtures and similar items. Nickel-silver is favored by interior decorators because it may be obtained in a number of delicate tints. Nickel alloys, both nickel-silver and stainless steel, and nickel or chromium nickel-plating are used for many other ornamental objects like ash trays, candlesticks, picture frames and even for some of the modern metal furniture.

Take a look into some of the rooms in the modern house—the kitchen with its Monel sink, table, cabinet tops and hot water tank, the dining room with its nickel-silver or silver-plated tableware, the living room with its radio, the bathroom with its chromium or nickel-plated plumbing fixtures. Nickel is everywhere. When the doctor comes, he uses instruments made of nickel alloys. The bristles in your toothbrush are held in place by nickel.



What, No Engine?

Side view of one of 20 streamlined rear-motor buses, recently put into service by Toronto Transportation Commission, and reported to be first of their type delivered in Canada. The engine is in a separate section of the coach body at the rear, separated from the passenger compartment by a noise-insulated, dust-proof and heat-insulated partition. There are many applications of nickel in their construction. The crankshaft is of heat-treated chrome nickel steel, and nickel content is found in connecting rods, intake valves, brake shoe rollers and pins, axle king pins, transmission parts, distributor driven gear and spring clips.

FANS CAN LOOK TO RIP-SNORTING TILTS

"Fastest hockey league in Canada."

That's the tag which can be pinned on the 1936 edition of the Nickel Belt loop, and it's no board of trade propaganda or publicity agent's pipe dream, either.

From Halifax, down by the sounding sea, to Yorkton, out where the wheat fields grow golden in the prairie sun, is collected the constellation of puck-chasing peers who will mix it in the six-team tussle this winter.

Olympic aces, Allan Cup stars, and countless heroes of regional championship tilts are all mixed up together in the big melting pot from which Nickel Belt coaches tap their matte, and it needs no assay expert to forecast a season of 99.97 per cent. pure excitement.

REFINERY TAKES OPENER

As Triangle goes to press, Refinery has just eliminated Creighton from the Charity Trophy Series, grand prelude to the Nickel Belt schedule, in which the INCO teams play a knock-out competition for the handsome Donald MacAskill Trophy.

Bruising, banging hockey it was, with quarter neither given nor asked, and last year's Charity Series winners getting a 5-2 decision. Opening game of the season, it gave the capacity crowd an idea of what to expect when the clubs hit their real stride. The crowd seemed satisfied.

Somewhat gentler than the bumps it produces, fortunately, is the purpose of the Charity Series. Proceeds are placed in a special Charity Fund administered by Copper Cliff Branch of the Canadian Legion for the assistance of less fortunate families of the district, having in mind particularly the Christmas spirit.

The Nickel Belt loop which hangs up a world-record by starting as early as November 2, welcomes the return of Coniston, an original franchise-holder, which joins Frood, Copper Cliff, Creighton, and Refinery in the INCO representation.

To post its readers on all the INCO clubs, Triangle has attempted to obtain a complete survey of the players on hand at the start of the season, their positions, their home towns, and the previous club for which they played:

FROOD

Teno—goal, Hamilton Tigers, 1936, Sr. O.H.A. champs; Graham—defence, Halifax Wolverines, 1935, Allan Cup; Lavigne—defence, Halifax Wolverines, 1935, Allan Cup; Kampman—defence, Kitchener, Creighton, 1936; Emple—defence, North Bay, Sudbury Juniors, 1933-36; Hastie—forward, Windsor, Hamilton Tigers, 1936; Cholette—forward, Hull, Paris, 1936; Hill—forward, Saskatoon, Cub Wolves, 1934; Dewey—forward, Moose Jaw, Saskatoon Quakers Olympics, 1933; Conick—forward, Hamilton Tigers, 1934; Chamberlain—forward, South Porcupine, 1936; Heximer—forward, Niagara Falls, Sudbury Juniors, 1936; Kemp—goal, Niagara Falls, Sudbury Juniors, 1934; Healy—goal, Owen Sound, Sudbury Memorial Cup team, 1933; Cadieux—forward, Ottawa, 1935; Grosso—forward, Soo, Sudbury Juniors, 1934.

COPPER CLIFF

Forsyth—goal, Queen's University, 1935, offered tryout with Chicago Black Hawks; Kettles—goal, Ottawa, Refinery, 1936; Porter—defence, Sudbury Memorial Cup team, 1933; Shewchuck—defence, Brantford, Sudbury Juniors, 1935; Slater—defence, Arnprior, Atlantic City Seagulls, 1936; Reid—defence, Brockville, Lake Placid, 1936, picked for American Olympic team; Godfrey—forward, Toronto, South Porcupine, 1936, reserve list

Hamill

New York Americans; Hamill—forward, Toronto, South Porcupine, 1936, reserve list New York Americans; McReavy—forward, Owen Sound, St. Michael's College, 1936; McKinnon—forward, Copper Cliff, Atlantic City Seagulls, 1936; Gorman—forward, Buckingham, Refinery, 1936; Carthey—forward, Windsor, 1936; Smith—forward, Woodstock, re-instated pro. who played for Syracuse and Buffalo; and the following members of last year's team: LaFrance—forward, Sudbury; Anderson—forward, Windsor; Bellingham—forward, Hamilton; Dinning—forward, Hamilton; Baker—forward, Hamilton; Litzen—forward, Hamilton.

RESISTS CORROSION

Because cold rolled steel lever arms corroded rapidly, Monel Metal arms are used in sea coast towns on openers for casement windows.

CREIGHTON

Higginbottom—goal, Kenora Thistles, 1935; Guest—forward, Renfrew, 1936; Perry—defence, Toronto Marlboros, 1936; McGlashen—forward, Halifax Wolverines, 1935, Allan Cup; Shields—forward, Halifax Wolverines, 1935, Allan Cup; Mosher—forward, Halifax Wolverines, 1936, Olympic team holdout; Smith—defence, Kenora Thistles, 1936; Thompson—forward, Port Arthur Olympics, 1936; Hermanson—forward, Port Arthur, 1935; Hogarth—forward, Port Arthur, 1936; Silver—forward, Saskatoon, Frood, 1935; Bailey—goal, Hamilton, 1935.

Thompson

Arthur Olympics, 1936; Hermanson—forward, Port Arthur, 1935; Hogarth—forward, Port Arthur, 1936; Silver—forward, Saskatoon, Frood, 1935; Bailey—goal, Hamilton, 1935.

REFINERY

Burlingham—goal, Battleford, Yorkton Terriers, 1936; Ramsay—goal, Toronto, Good-year Hockey Club, 1936; Singbush—defence, Winnipeg, Portage la Prairie, 1934; Tupling—defence, Toronto, Atlantic City Seagulls, 1935; Childs—defence, Port Arthur, 1935; Hart—defence, Winnipeg, San Antonio, 1936; Jennings—forward, Winnipeg, San Antonio, 1936; Fletcher—forward, Winnipeg, San Antonio, 1936; Cairns—forward, Battleford, North Battleford, 1936; Baird—forward, Stratford, 1936; Osland—forward, Winnipeg, San Antonio, 1936; Currie—forward, Cayuga, Durham, 1935; Seymour—forward, Ottawa Senators, 1936;

Marshall

1936; Baird—forward, Stratford, 1936; Osland—forward, Winnipeg, San Antonio, 1936; Currie—forward, Cayuga, Durham, 1935; Seymour—forward, Ottawa Senators, 1936;

Coniston Girls Standout of the Summer on INCO Sporting Fronts

On all sporting fronts INCO employees put in an active and successful summer, bringing within the triangle many trophies and distinctions.

Outstanding record was that piled up by the Coniston girls' softball team, who celebrated their first season of play by knocking right at the door of the provincial championship. Practically unknown when they tangled in the first-round playdown with North Bay, the Coniston lassies, under the management of Albert Deeks, won two straight, showed a marked improvement in form every time they took the diamond.

They went on to eliminate Kirkland Lake two straight, then took Ottawa in their stride, two out of three.

Then they tackled Windsor, lost the first game by an overwhelming score, looked to have come to the end of their tether. But they bounced right back into the fight by winning the second game, and were only defeated in the final showdown by a 2-1 score in overtime.

"Jerry" Fitzgerald, the Coniston girls' ace pitcher, has been nominated by the Provincial Women's Softball Union for the 1936 award of the Norman Craig trophy, which is given annually to the woman athlete adjudged most valuable to her club in her particular branch of sport in the province during the season. That's tops, "Jerry"!

So INCO sports orchids go to Coniston girls for the 1936 summer season.

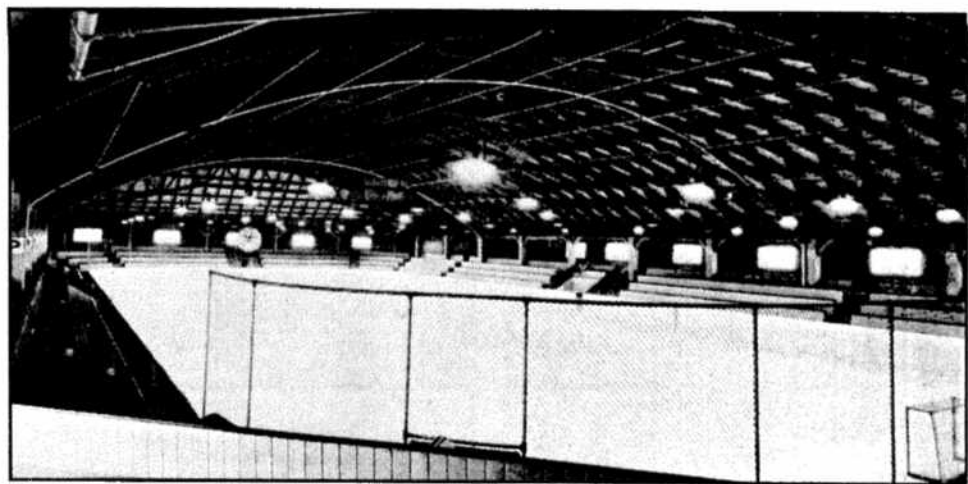
BASEBALL

Monel Cup winners after a thrilling playdown series turned out to be Barney Barnett's Froodians, who took the measure of Creighton in the finals, two games out of three, the deciding victory being an 8-5 win on September 10, and Beaver's home-run wallop with two on base proving the winning blow. In the semi-finals, Creighton had eliminated Refinery in two straight, and Frood had handed the same medicine to Copper Cliff.

Since several of Frood's players were ineligible for the provincial playdowns, Creighton was given the right to represent the Nickel Belt for the provincial intermediate "A" title, but decided not to follow up the quest.

Similarly Coniston Buzzers, after trouncing the snappy South River nine for the Northern Ontario Intermediate "B" championship, retired on its laurels and passed up the expensive hunt for provincial honors.

September 19 saw a senior baseball classic between Creighton and an All-Star team picked by Bert Flynn from the remaining Nickel Belt clubs. The All-Stars hammered out a decisive 7-5 win with the following team: Pitchers, Bill Sprung, Frood; Archie Deyell, Falconbridge; Bob Deacon, Copper Cliff; Catchers, Wiggy Walmsley, Copper Cliff; Howard Bradley, Falconbridge;



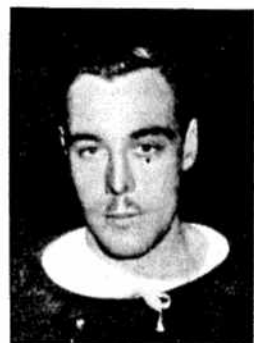
Nickel District Sport Hub

Busier than the inside of a beehive, and a much more pleasant place to visit, is Stanley Stadium, Copper Cliff's artificial ice palace. From early morning until late evening, daily except Sunday, the Stadium operates at high pressure, accommodating skaters, fancy skaters, and hockey teams. Last season the Stadium turnstiles clicked for more than 35,000 cash customers; this season's business will be bigger on account of the earlier opening.

Atkinson—forward, Battleford, North Battleford, 1936; Houston—forward, Arnprior, Pittsburg, 1936; Marshall—forward, Ottawa, Moncton Hawks, 1935; Woods—coach, Elora, Saskatoon Quakers, 1934.

CONISTON

Blake—goal, Coniston; Price—defence, Brockville, 1936; Sherry—defence, Port Hope, Brockville, 1936; Creswell—defence, Coniston; Lowrey—forward, Ottawa, Brockville, 1936; Darragh—forward, Ottawa Rideaus, 1936; McCabe—forward, Almont, St. John's, 1936; Morgan—forward, Belleville, 1936; Legris—Renfrew, 1936; Marion—Ottawa, Potsdam, 1936; Leclair—forward, Coniston; Stack—forward, Winnipeg, Nelson, 1936. Another goal-keeper, a defence man, and three forwards are still to join the Coniston club from outside points.



Price

annexed enough silver to start a jewelry store. He lifted the G. M. Miller Trophy in the Soo-Sudbury tourney, the Coniston Cup, and a putting prize. Then, for a finishing touch, he carried off the E. A. Collins Trophy, emblematic of the club championship, for the third year in succession.

Norman Kearns, of Copper Cliff, and his partner, Miss Betty McLeod, won the Barney Leak Cup for mixed two-ball foursomes. To Sam Nute, also of Copper Cliff, went the Ross Shield. Bob McAndrew, of Frood, won the Acme Timber Cup, and Leland Fraser, of Copper Cliff, won the runner-up prize for the Agnew Cup.

On as late a date as October 17, the long-drawn feud between E. A. Collins and P. F. McDonald for golf supremacy was still at white heat, although it showed signs of cooling for the season when Mr. McDonald had to hurry away to keep a skating date with Frank Taylor.

Swank Trophy for Canadians

Strikingly unusual in concept and design, the Lou Marsh Memorial Trophy will in future be awarded annually to the Canadian athlete, man or woman, professional or amateur, whose performance is considered by a board of five judges to be the most outstanding of the year.

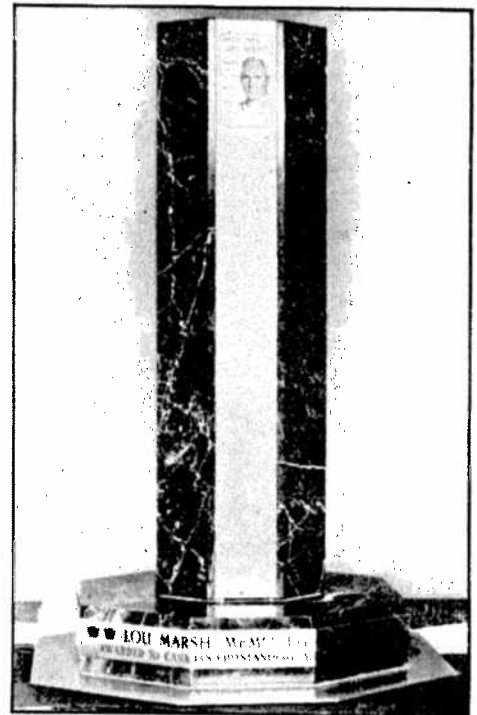
HONORS LOU MARSH

The award is to perpetuate the memory of one of the Dominion's most noted sportsmen and sports writers, the late Lou E. Marsh, of Toronto, who died suddenly early in 1936. An outstanding authority in his field, Lou Marsh was always noted for his bluntness, frankness and outspoken attitude, his dislike of hampering conventions and red tape.

In planning a trophy to honor his memory, the Canadian sportsmen concerned insisted that the design must be in keeping with the nature of the man whose achievements it will commemorate, that it must studiously avoid the stereotyped and conventional. The result is a complete departure from any previous examples of this art in the Dominion.

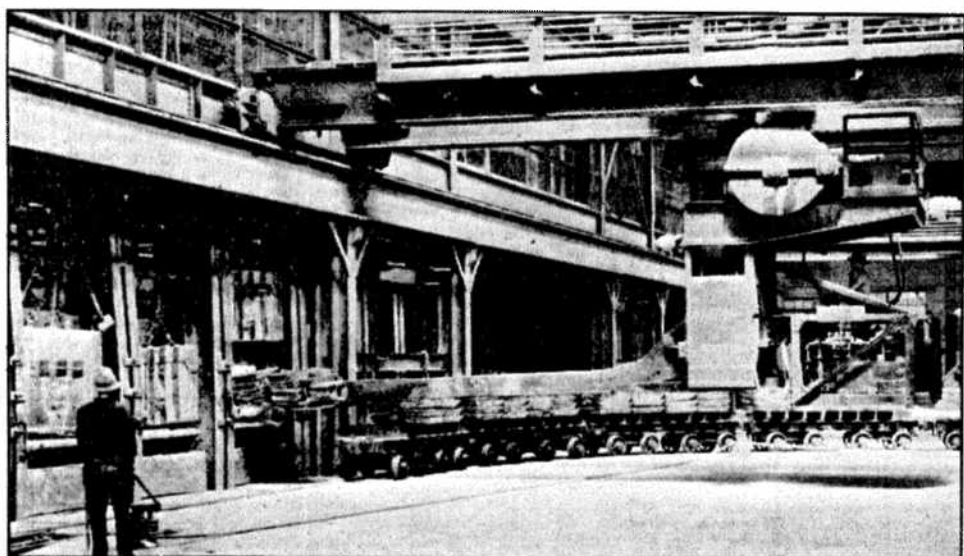
SOFT, SILVERY MONEL

A three-foot pylon of black marble, flecked with gold, is mounted on a black

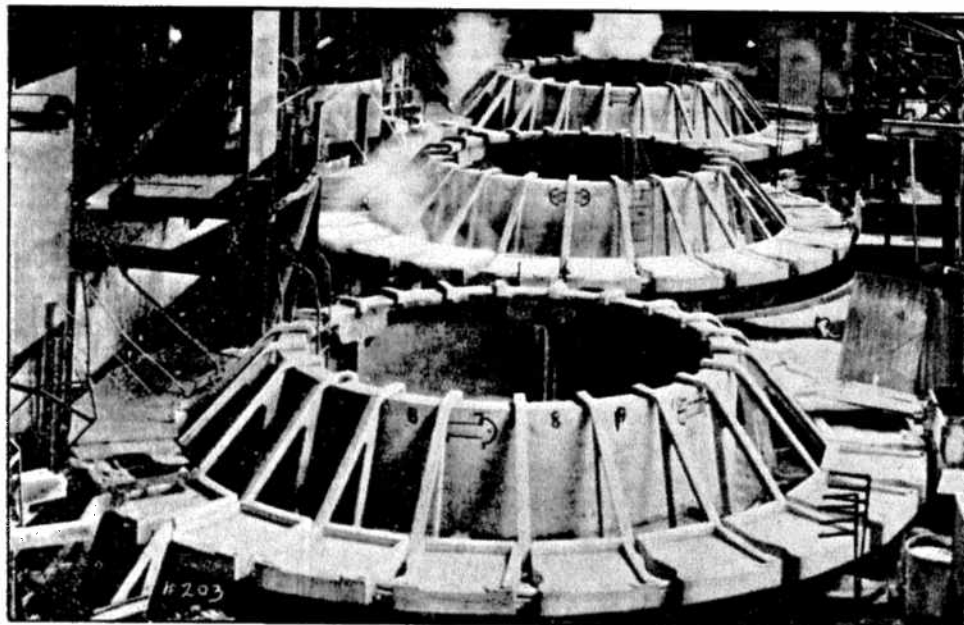


marble base. Around the base is a band of soft, silvery Monel Metal on which the name and purpose of this unique Canadian trophy is engraved. One side of the hexagonal pylon is faced with Monel Metal with the newspaper column heading which appeared daily over Lou Marsh's writings, engraved at the top. The names of the winners will be inscribed below on the untarnishable surface of the metal. A miniature replica of the trophy will be presented to each winner.

330 Tons of "Cookies" in Each Charge for the Anode Furnaces



Sixteen cakes of blister copper, each cake weighing 500 lbs., are fed at one time to the Refinery anode furnaces by this dexterous crane which, however, never burns its fingers.



From the anode furnaces the molten copper is ladled into the molds of the big casting wheels shown in this photo. Each mold takes a 550-pound copper cookie.

(First of a Series of Articles on Operations at Ontario Refinery, Copper Cliff)

The feed to the refinery is a product of the smelter, namely, blister copper.

This "blister," so called because of its rough blistered appearance, contains small amounts of silver, gold, platinum metals, selenium, tellurium and nickel. The elimination of impurities and separation of the copper from these metals, followed by their production in marketable form of high purity, is the function of the refinery.

EXTENSIVE TESTING

The blister cakes, weighing about 500 pounds, are transported to the refinery by means of railroad flat cars and upon their arrival are unloaded to small narrow gauge plant trucks. These cars with their load of "cakes" are then carefully weighed and check-weighed. One out of every four is then drilled in order to obtain a sample for the assay office, where chemists determine the exact amounts of various metals that are present with copper. The laboratory is a very important division of the plant and there the most minute quantities of metals can be accurately determined by means of chemical and fire analysis.

The first department to treat this in-

coming blister copper and the one which will be described in this issue is the Anode Department.

The anode furnaces are constructed of structural steel and refractory bricks and are approximately 60 feet long, 18 feet wide, and 12 feet high.

DEXTEROUS CRANES

The charging of blister cakes is accomplished by means of special type cranes which can be seen in the photograph. The crane carries 16 cakes at a time into the furnace and the ease and dexterity with which the machine is handled by the operator always impresses the onlooker. Its resemblance to the human arm and hand is very noticeable and is quite frequently remarked upon.

About 330 tons of cakes constitute each charge and the copper is molten after about 12 hours of continuous pulverized coal firing. Iron pipes are then inserted and air is blown into the mass of liquid copper. This operation is called "flapping;" its purpose is to provide oxygen to combine with certain impurities present in the copper.

After this step a considerable amount of slag or impurities can be seen floating on the bath. This is "skimmed" and, after cooling, is crushed, sampled and returned to the smelter.

In order to bring the molten copper to a suitable condition for casting, the bath is then "poled." In this operation large green hardwood poles are inserted through the skim door and forced into the bath by means of an air lift. Some excess oxygen remains in the copper from "flapping." This is removed by "reducing" gases liberated from the burning wood. Usually five or six poles are required before the bath is "reduced" to the desired condition. Samples are taken frequently and when these indicate that the molten copper is in casting condition the furnace is "tapped."

CASTING THE ANODES

The casting of anodes is accomplished by means of large wheels shown in the photograph. The operators pour the copper from the ladles into shallow copper molds which have previously been coated with an alunite wash to prevent sticking. After about 550 pounds of copper have been poured into the mold the ladle is tilted back and the wheel moved until another mold is in position to receive its share of the molten material. The anodes, as these flat castings are called, are removed from the molds by means of an air lift and are immersed, while still red hot, into a cooling bosh filled with water. When 38 of these anodes are ready in the bosh the crane lifts the group by means of a swinging rack and loads them to narrow gauge plant rack cars.

The anodes are carefully weighed and stored ready for removal to the tank house where they will be electrolytically refined.

Sudbury Dairy Installs Monel Metal

A marvel of human ingenuity is the new milk-handling and milk-bottling equipment at the Palm Dairies plant on Shaughnessy St., Sudbury.

The complete equipment for the handling of milk from the time it enters the Palm Dairies plant until it is bottled and sent on its way to the refrigeration department to await delivery, was purchased from Cherry-Burrell Corporation of Canada, Limited, nationally-known manufacturers of dairy equipment. Practically every bit of the machinery, including the pipes through which the milk passes during the different stages of pasteurization, is made of Monel metal, produced from the Sudbury mines, this metal being chosen for its non-corrosive and stainless qualities.

JOINED UP AT THE VICTORIA

John McMullen, of Coniston, watches while a powerful big crane rumbles overhead up the converter aisle, drops bales over the handles of a 185-cubic-foot steel pot, hoists it with ridiculous ease, and, swinging over, gently pours its load of 12 tons of molten matte into the gaping maw of a converter.

John McMullen sighs with satisfaction, as his mind harks back to the old smelter near Victoria Mine, where he started work on May 8, 1906.

The smoothness and efficiency with which ore, matte, and slag are handled now by conveyor belts, cranes, and trains, sometimes make the old days seem like a quaint dream to him.



John McMullen

BUCKETS USED TO DO IT

When he arrived on the scene, ore was transferred by bucket line from Victoria Mine to the roast beds, where thousands of tons were piled on an open-air pyre of cordwood, the wood was ignited, and the ore left to roast for from three to five months to remove the bulk of the sulphur it contained. Then, again by bucket line, the roasted ore was transferred to the storage bins in the smelter.

In two-wheeled buggies, which would hold about 800 pounds each, the ore was trundled to the open blast furnaces and just 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.

A SLAG-POT PUSHER

From the furnaces the matte was taken into the settler, and from there fed by a trough to the two converters. Slag from the converters was drawn off into pots holding from 300 to 400 pounds each, and the pots pushed out to the dump. John McMullen's first job was pushing slag pots. When the Mond Nickel Company moved to Coniston in 1913, he was still on the force, and now he is general foreman of the Coniston smelter.

He was born on a farm in Westmeath township, Renfrew County, Ontario, in 1879, and seemed elected to a farmer's life until he came once to visit his sisters, Mrs. S. Anderson and Mrs. J. D. Nelson, at Victoria Mine. After that he went back to the farm, but the spirit of the new northland had infected him, and in a few months he was back at the Victoria.

Saturday, September 27, Mr. and Mrs. McMullen celebrated their silver wedding anniversary. They have one son.



Close Call

Had it not been for his safety glasses M. Alavanja, of the Port Colborne plant, would very probably have lost the sight of his right eye on February 11, 1931. He was pouring converter copper from a ladle into the molds in the converter department when a splash of molten copper struck the lens and cracked it, but did not touch his eye. In Triangle's photograph is clearly shown the deposit on the lens. The glasses are still on display at Port Colborne, a convincing object lesson to employees.

RECALLS THE LADDER DAYS

One of the small group of old-timers who started as miners with the Canadian Copper Company and are still in that department of INCO



Frank Anderson

never been back across the pond.

When he was 18 he had drifted to Copper Cliff, was on the force of the Canadian Copper Company at the old No. 1 mine.

YOU HAD TO CLIMB

Those were the cage-less days when the shaft had two compartments and a ladder-way, and a man had his 900-foot climb up the ladder after a hard 10-hour day because mining regulations forbade him riding in the skips. Approximately 100 men were working at the No. 1 when he arrived, and 150 tons was considered a good day's hoisting.

Frank Anderson started in as a mucker, then became a pipe fitter, a driller. They drilled dry then, without today's water lines, and sometimes your partner might be boring away within 12 feet of you, but you wouldn't know it except for the noise, the dust was so thick.

Finally, in 1901, at the No. 2 mine, Frank Anderson was promoted to shift boss, and in 1906 he went to Crean Hill as general foreman, transferring to Creighton in the same capacity in 1910.

Three years later he retired temporarily from service and went farming to build up his health. He bought land in Waters Township, still owns it, is proud of a herd of 100 fine dairy cattle.

The soothing sound of the chewing of many cuds, however, is no music to the ears of an old mining man, and Frank hopped back into the harness at Frood in 1926 to be near the clanging hoist signals again, is a toplander. Of his family of five two sons are on the force at Creighton.

A LOYAL EMPLOYEE

Fifteen years of his service he served under "Cap" Hambley. "You couldn't stump him," says "Cap." "He'd go any place, do anything, was never afraid of any kind of work."

They still tell a story about Frank Anderson going fishing on the Vermilion with two pals one day back in 1908. The waves rolled high and over went the canoe, plunging the trio into the chilly depths. His friends immediately struck out for shore but Frank deliberately sank to the bottom, sat down and took off his boots before he'd start swimming.

Such a man is a believer in personal comfort and it's therefore no wonder that Frank is liberally upholstered as well as immensely popular.

REVERB SHIFT SETS RECORD

At 4.00 o'clock on the afternoon of October 17 Foreman Sid Smith and his reverb shift heaved a sigh of relief but kept their fingers crossed.

They had just shattered their own Safety Clock record of 40,689 shifts without an accident, had hung up the new all-time Smelter Departments' record of 40,715 shifts without an accident, were determined to forge on to even more spectacular safety triumphs.

To Smith and Sid Smith his men wrote Superintendent of Smelters P. F. McDonald: "I am pleased to see in today's reports that you have succeeded in breaking your previous record of safe shifts worked. I note your previous record of 40,689 safe shifts extends over a period from May 14, 1934 to September 27, 1935. Your present record is 40,715 safe shifts and dates from the latter date. In other words, your shift has experienced one accident only in the past two years and five months, and no accidents in the past year."

"Such experiences as these can be obtained only by careful work on the part of every man and the closest of supervision."

"I am greatly pleased that these excellent records have been established in a smelter department, and I would ask you to accept on behalf of yourself and your men my heartiest appreciation."



Sid Smith

The Easy Way Proved Painful Way

It might have seemed easier to roll that large chunk of rock along the floor a short distance so that it would fall into the chute and he would be spared the work of sledging it into small pieces as is the proper practice.

But the Frood miner who attempted to do so, a day last January, later fervently wished he hadn't.

The chunk caught his hand against a post—fractured his thumb. He was forced to take a month's holiday while it healed.

Obedying Orders Is a Sound System

Strict following of instructions is an employee's best self-protection against injury from accidents.

Although he had been warned always to use a long bar when turning pots, and had twice been checked up for doing otherwise, a baleman on the Orford converters at Copper Cliff one day last June used a shackle pin.

When turning, the pot struck a transfer car, causing a slag spill. Some of the slag splashed into the erring baleman's mitt, causing severe burns on his right hand.

TELL TRIANGLE

(Continued from Page 2)

badminton club is open gratis to any paid-up member of any INCO athletic association, or member of his family not regularly employed, and cards can be obtained from Mr. McGill.

¶ A double play for Dan Cupid was the score against the accounting department September 12 when Ross Corliss was wed at Coniston to Helene Kidd. Office associates presented them with a chest of silver and a coffee table. Cupid lurks in ledgers too.

¶ Figure-skating devotees are already active at Stanley Stadium, and the club this season anticipated a considerable increase over last year's total enrolment of 75.

Frood

¶ September 22 a unique record was set by O. Edin and his 50 men on the 2,800 south division when the safety department on their regular inspection allotted his division the total number of points allowed for general appearance of working places, in the monthly safety bonus competition. Each working place in this division was, as usual, carefully checked for evidence of faulty or careless work, and for cleanliness and neatness. Divisions very often approach this record, but this is the first time in the history of the mine that a complete okay was given.

¶ Other outstanding Frood safety records include that of the Casey Jones shift, which on October 11 completed one year with 28,058 shifts without a lost-time accident. This is the best production shift boss record yet established at Frood, and is a great credit to Jones and his men. Further records made by shift bosses and their men without a lost-time accident: J. Ressel, 20,000; George Deschenes, 24,000; W. Armstrong, 21,390; B. McAllister, 23,013; H. Cherry (construction), 28,494; M. Lahti, 21,210. The Lahti record extends over a period of almost three years, and includes a period of shaft sinking.

¶ Frood weddings: at Renfrew, H. W. Aitchison to Iva Johnstone; at North Bay, October 3, W. Gaylor and Florence Wheeler, of Montreal; at Copper Cliff, September 23, Edwin Fitzjohn to Marion Gribble.

¶ Frood geological department is assured the nucleus of an efficient staff in 1936 in the person of Patrick Ogilvie, Jr. Proud Pappy Ogilvie was passing out cigars morning of October 10. Another recent birth: to Mr. and Mrs. R. Gallipeau, September 24, a son.

¶ Promptly and generously the boys on 2950-3100 levels donated a purse for a fellow-worker, in the hospital following an accident received while off work.

¶ Butch Ross and Dunc McNaughton are still trying to figure how many ducks can be brought down at 500 yards with one charge. In the meantime they've issued invitations to a duck dinner, printing in the corner "B.Y.O.D.", which of course means: Bring Your Own Ducks.

¶ George Field, Creighton bush-leaguer, has been signed up by the Frood engineering department to manage the stope gang. Maxie Monteith has returned to the Frood office after a delightful visit in the Copper Cliff office. He looks rested, plump.

¶ A jealously guarded secret is Robert Grigor's recipe for making flowers grow on rock. Wonder if it could be used for bald heads too.

¶ Mentioned in dispatches, cited for bravery, and recipient of the Croix de Froode is Jack Thompson, yard boss, who took a shot at Old Grumpy, the lumber yard bear. Old Grumpy is still alive, but nevertheless Jack got his medal, an artistic bit of Froodian jewelry.

Refinery

¶ A maid employed at the home where Steve Tracz resides was heating a can of floor wax on the kitchen stove; can exploded, showering burning wax on her clothing, enveloping her in flames. Steve heard her screams, rushed in and wrapped a blanket around her to smother the blaze, saved her life. He lost a day's work from burned hands.

¶ One day about two months ago Nick Nykietchyn came home from work to find that all his personal belongings had been stolen during his absence. Later, on a vacation trip to Toronto, he saw a former Sudbury "friend" on the street wearing one of his suits. Police did their best for Nick, but most of his purloined duds had been sold.

¶ A number of ORCO employees are members of the Canadian Ukrainian Sitch Association, chartered by the federal government. Charter of the organization outlines its aims: to foster education, sport, culture, religion, and to encourage members to become good citizens of Canada. Chief Commissioner for Ontario is Nick Stuss; John Galwaldo and John Bilinsky are respectively president and executive member of the local chapter.

¶ Nick Kronor's father was an Austrian, his mother a Ukrainian, and he was born in Canada. Yet he firmly maintains he's a

Spaniard. Okay, Senior Nick, we won't argue!

¶ Herman Cook's training in Fire Chief Kitchener's hook-and-ladder brigade stood him in good stead recently when flames threatened the Baxter Ricard home, Mackey subdivision. Herman worked promptly, averted danger, won praise from Sudbury's Fire Chief Andrews.

¶ Good news it is that Bill Lovat's son Peter is out of hospital, progressing favorably. In a boxing bout latter part of August young Peter was apparently slightly injured, then developed complications. A series of operations in a Toronto hospital corrected a serious condition.

¶ Wed, September 14, to Willa Armstrong, Bob McIntosh was presented with an electric coffee percolator by some of his ORCO friends, who will not be averse to partaking of its good cheer now and then.

¶ A son arrived in the Dunc Forster home October 11. Daddy Forster let the affair excite him considerably, forgot to drain the radiator of his car, found it frozen in the morning.

¶ Al Welblund went to New York for the World Series, discovered that the Nickel Belt isn't the only place where baseball scores sometimes resemble boxcar numbers.

¶ If Vern Tupling can stick it out on the ORCO hockey defence line a few more years, he'll have another fair supporter in the bleachers — Daughter Tupling, born October 8.

¶ Other arrivals: to Mr. and Mrs. Stesco, September 19, a son, Robert Allen; to Mr. and Mrs. Harry Lipscombe, October 12, a son; to Mr. and Mrs. John Tallevi, a daughter; to Mr. and Mrs. Walker Greenwood, a daughter.

¶ C. Hodgins drew a lucky "day off" September 17, was wed to Mary Kulmala, of Sudbury. There may be other things to do on a day off but few of them last as long.

¶ Gatchell-residing ORCO employees rubbed their eyes the morning of September 22 when "Flash" Matthews flashed past at 12-13 miles per hour. Maybe, they figured, it's the borrowed car; then, again, maybe it's the thought of another \$16.50 touch.

Creighton

¶ Canada geese at Moosonee must have thought they had been transferred to the Spanish war when they woke up morning of October 7 and heard the big boom-boom from the guns of R. H. McInnes and his partner. Bob brought the Northern Ontario hunting championship to No. 5 shaft by bringing down a record bag of the big beauties, and says the slaughter would have been greater if they'd had real decoys—they used amateur decoys made of mud, a stick, and some paper.

¶ D. G. Shutt has gone to Toronto to make his home, severing 25 years' service with INCO, and leaving behind him many warm friendships.

¶ George Fields has been transferred to the survey department at Frood. Here's advance notice to Frood bridge sharks . . . don't say we didn't warn you.

¶ After spending two months in Sweden, M. Johnson and family have returned to Creighton, say everyone over there seems happy, contented.

¶ Wilfred Leck reports spotting a fox on the Creighton Road. It jogged ahead of his car until Wilfred muttered: "I'll nab you, my friend." Barked foxy fox, "What fur?" and dived into the bush.

¶ Wed October 10 at Toronto, Mr. and Mrs. Jack Buchanan (nee Francis Elgie) are honeymooning in New York, and will get a rousing reception on their return to Creighton.

¶ Returning from a visit to the copper mines in Michigan, A. Hasson says conditions are improving in that territory.

¶ Mr. and Mrs. J. Dingwall are back from a six-week sojourn in England and Scotland. John Jr. returned with them, and will make his home in Canada after living in England for eight years.

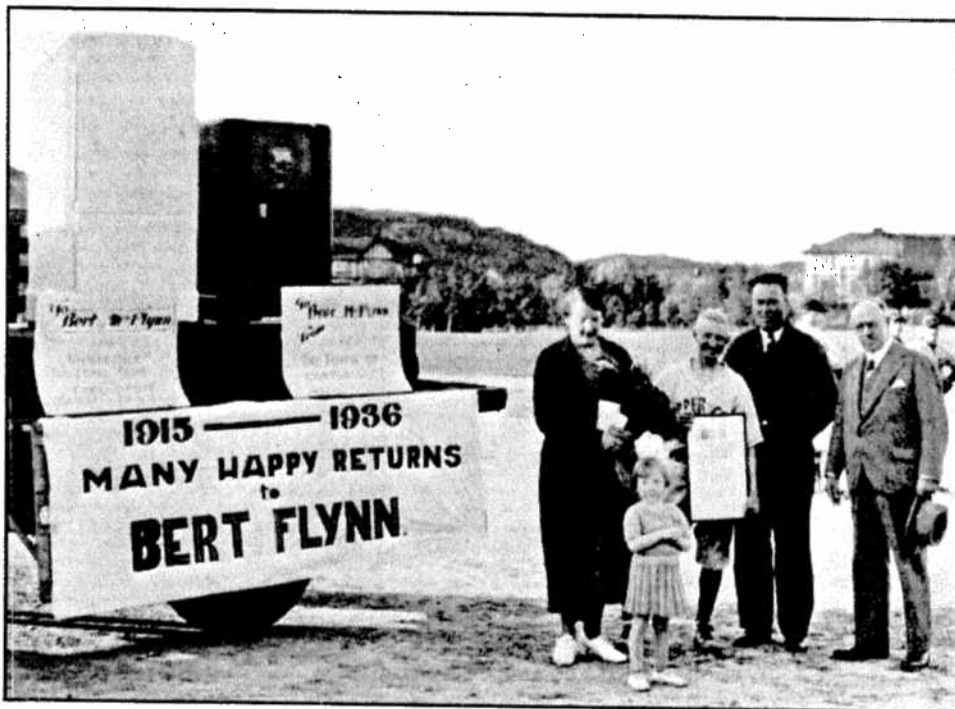
¶ With tennis over, badminton is in full swing at the Lake St. Hall, and a large and enthusiastic club is playing this season. The trophy put up by the Tennis Club for junior members was won by Robert Pascoe. Young Bob attends St. Albert's College in Belleville, and won the college championship in his class.

¶ Voluntary labor, supplied by Creighton citizens, is showing good results in construction of the new manse.

¶ Excavating a well at his home on the Creighton Mine Road, Happy Tomassini found a man's glove 21 feet underground. There was nothing else to indicate that a human being had ever been there. The new house is at the intersection of the Creighton Mine Road and Anderson's side road, on flat ground. Considerable work has been done on the roads at that intersection in years past, and it is believed the house is standing on an old fill.

NO STAINS NOW

Monel Metal tread is now being used on machine wheels in a large leather factory. Stains on white leather formerly appeared when brass was used to guide it through a braiding machine.



Well-Earned Recognition

Before 1,000 fans who cheered him to the echo, Bert Flynn was honored September 18 for his 21 years of outstanding service to Nickel District sportdom. During a "Bert Flynn Day" at Nickel Park, he and Mrs. Flynn received a radio from the citizens of Copper Cliff, an electric refrigerator from Nickel Belt fans and the Copper Cliff Athletic Association, the only existing life membership in the latter organization, and a nice fat purse. Making the presentations, Mayor Collins lauded Bert's efforts to develop home talent, remarked on the infectious spirit of determination, fight, and sportsmanship with which he always imbued players. Another presentation made by Bob McDonald was a pen and pencil set from the Capreol Baseball Club. In the Triangle photo: Mr. and Mrs. Flynn, Bob McDonald, Mayor Collins, and little Catherine Flynn who, along with a lot of other people, thinks daddy is okay.

35 YEARS IN INCO SERVICE

Port Colborne cannot boast of as many employees, old in the Company service, as Copper Cliff, since operations commenced



Wm. Mayhew

here in 1918 while at Copper Cliff doings date back to 1885. Among the Port Colborne employees are men who were transferred here from Bayonne, N.J., and from Copper Cliff. While he has not the longest service, yet with 35 years with the Com-

SEA-GOING MAN

Bill, as he is called by everyone who knows him, came to Montreal in 1886, and served his apprenticeship as a machinist with Jas. Cooper Machine Works. He then entered the service of the Northern Navigation Company as an engineer. Among other steamers on which he had charge of the engines, was the City of Midland, on the route between Collingwood, Ontario, and Port Arthur. He made these trips through the old St. Mary's River Channel past Garden River, before the newer Hay Lake Channel was dredged for traffic. Those readers who have travelled by boat through the thirty thousand islands of the Georgian Bay and along the North Channel past the Sault to Lake Superior and Port Arthur, will well remember what a delightful boat trip this makes. Later on he was on the S.S. Kenora out of Kenora, Ont., then known as Rat Portage.

In 1901 Bill came to Stobie Mine to take charge of the Steam Power Plant, which had been moved there from the Evans Mine at Copper Cliff. With the Company then were John Lawson, Superintendent of Mines; Jas. Harris, Captain of Frood Mine; Mr. Campbell, Master Mechanic, and A. P. Turner, President of the Canadian Copper Company, under whose name the operations were carried on. Frood, the discoverer of the mine since named after him, was at that time living at Portlock, Ont.

Workings were about 300 feet deep, but were shut down shortly after as richer ore was being mined at Creighton.

AT OLD O.S.W.

In 1903 Bill was transferred to the Ontario Smelting Works (a subsidiary of The International Nickel Company), in charge of Power House and Blowers. All electric power was developed by steam, this being before the construction of the Hydro Electric Plant at High Falls. He well remembers the making of briquettes from calcined matte for charging into the furnaces and the use of hand drawn wheel

pots. These works were burned down in 1904 and Bill was transferred to what was called the Farm, which is the site of the present Smelter. Here his job was to keep the wheels turning in the Power House, both steam and electric. He continued at this for nearly 20 years, and was transferred to Port Colborne in 1923.

This was the period of changing over from steam-generated electric power to electric power purchased from the Hydro. In addition to steam used for power, waste heat from the furnaces is converted into steam for use throughout the plant operations. When the temperature runs low, Bill is the man who must "turn on the heat."

Anniversary of Big Banquet

On November 30 falls the 31st anniversary of the official throwing-in of the switch at the High Falls Power Plant, and to the files of E. A. Collins Triangle is indebted for an interesting souvenir of that important event.

A total of 17 officials sat down to a banquet at High Falls on that 1905 evening to celebrate the conclusion of a big and difficult construction job. Mr. Collins preserved for posterity his copy of the artistically decorated menu, the back of which is historic with the signatures of all those present.

COPPER CO. OFFICIALS

Canadian Copper Co. officials in attendance were: President A. P. Turner, Chief Metallurgist David H. Browne, Purchasing Agent F. L. Shillington, Paymaster G. J. Oliver, Electrical Superintendent W. D. Fleet, Chief Clerk R. Kirkwood, General Superintendent John Lawson, High Falls Superintendent Geo. Hartmann, Dr. A. H. Anderson, E. A. Collins.

Representing various companies supplying materials for the installation were Henry Holgate, H. A. McIntyre, C. H. Baker, H. R. Snyder, L. C. Kauffman, E. C. Wheeler, A. R. Henry.

Despite its remoteness from sources of supply, the festive board groaned under a load of such tempting and appropriate fare as: Alternating Current Soup, Turkey with American Concrete Stuffing, Copper Cliff Goose, Sulphur Flavored; High Voltage Currents, Double Inflow Budweiser, Dewar's Lightning Arrestor.

NEW WHEELBARROWS

Weighing almost 50 per cent. less than the wheelbarrow of conventional type, new models with balloon tires are being made of nickel-aluminum alloy, and will carry a 15 per cent. greater pay load.

Tell Triangle!

With this issue Triangle commences a new service by publishing personal news briefs from the INCO plants. The generous assistance of a group of correspondents makes this feature possible, and we wish to acknowledge their hearty co-operation. If in future our readers will assist them by passing on to them interesting items about INCO workers, we will be able to make Triangle that much more entertaining for you.

The Nickel Converters

... where Iron Sulphide comes to the end of its journey, bids good-bye to its Copper and Nickel ore-pals ...

By NATHAN CRAWFORD

The molten matte produced by the INCO nickel reverberatory furnaces is a copper-nickel-iron sulphide. The nickel and copper, of course, are recovered later; but the iron sulphide is of no commercial value and is regarded as an impurity. It must be removed from the matte before that product can be satisfactorily treated in the well known Orford process for the separation of nickel from copper; and it is removed almost entirely as the matte passes through the nickel converters.



Nathan Crawford

A converter is a horizontal cylinder of steel 35 feet long and 13 feet in diameter. For easy operation it is set on rollers and surrounded by platforms. In order to hold a charge of molten matte it is lined with 18 inches of magnesite brick. Eight ladles, or about 100 tons, of furnace matte poured into the converter through its wide mouth by means of an overhead crane fills the space within the lining about half full. The converter is then ready for operation.

FORCE AIR THROUGH MATTE

The feature of the process is the passage of large quantities of air through the matte. This air is forced into the charge under 16 pounds pressure through a row of holes in the lining running the whole length of the converter about a foot and a half below the surface of the charge. These holes, called "tuyeres," are two inches in diameter, and 48 in number. They are kept from freezing over on the inside by the simple process of inserting an iron bar and hammering away the crust as fast as it is formed. This is known as punching tuyeres and it keeps two "punchers" busy continuously. But, as a result, enough air to fill the bowling room of the Copper Cliff Club is forced through the charge each and every minute.

The fuel used to keep the charge at a temperature of 2200 degrees, or thereabouts, is the very impurity, iron sulphide, which is removed in the process. Thanks to Mother Nature, the oxygen of the air entering through the tuyeres attacks both the iron and the sulphur, and burns them at such a rate that the rest of the charge is kept white hot. The sulphur, of course, in the form of gas, passes through the mouth and up the flue to the big stack. The iron, however, remains in liquid form and must be removed in a different way.

At the beginning of each "blow," after the converter has been rolled back roaring and spouting sparks and flames, several tons of sand are forced onto the surface of the charge through a "gun" at one end of the converter by means of compressed air. This sand contains a substance, called silica, which has the power of combining with the "burned" iron in such a way as to form slag which, fortunately, separates from the matte and rises to the surface.

WATCHES HIS "BUTTER"

At the end of the blow, then, the "skimmer" in charge of the converter turns his "shell" down, shuts off the air, and pours the top layer, which is slag, into a large pot below the converter. As he pours, or "skims," he thrusts a long bar with a flat upturned end into the stream of slag to test it. The slag adheres to this bar and resembles a layer of butter; the converter is turned down slowly inch by inch, until small brighter spots appear on the bar, or until a liquid appears which runs off the "butter" like water. The liquid is matte and must be kept inside the converter, so the converter is turned up again an inch or so until no matte runs out. In this way the slag is skimmed clean after each blow much in the same way as the top is poured off a bottle of milk. The pot of slag, however, still contains small droplets of matte which failed to separate completely from the slag so it is lifted by the powerful overhead crane and poured into one of the reverbs, in whose quieter atmosphere the matte droplets are enabled to settle and return to the converter later on.

Thus, each "blow," lasting 45 or 50 minutes, consists of charging sand, sometimes called "flux," elimination of sulphur up the flue in the form of gas, and burning of the iron in such a way that it will combine with the flux to form a suitable liquid slag, and at the end of this time the slag is skimmed off. As the iron and sulphur are removed the surface of the charge naturally sinks and room is made for more matte from the furnaces. A green light, or perhaps two, on the skimmer's platform informs the reverb furnace men of this fact as the converter is turned back for the next blow; the matte is tapped from the furnace into a ladle, wheeled out to the converter aisle by transfer car, and delivered to the converter by crane.

COOLING OFF WITH SCRAP

During the first 24 hours of blowing on a charge there is still a considerable amount of the combined fuel and impurity, iron sulphide, in the converter. For this reason

the amount of heat developed is often very great, and may be enough to attack the brick lining. In such a case a skimmer will call for scrap. That is, he will ask the crane handlers to bring him some of the cleanings invariably found in a large smelter, to be charged to his converter and help cool it off a bit. During this period the converter is said to be operating on a "green charge."

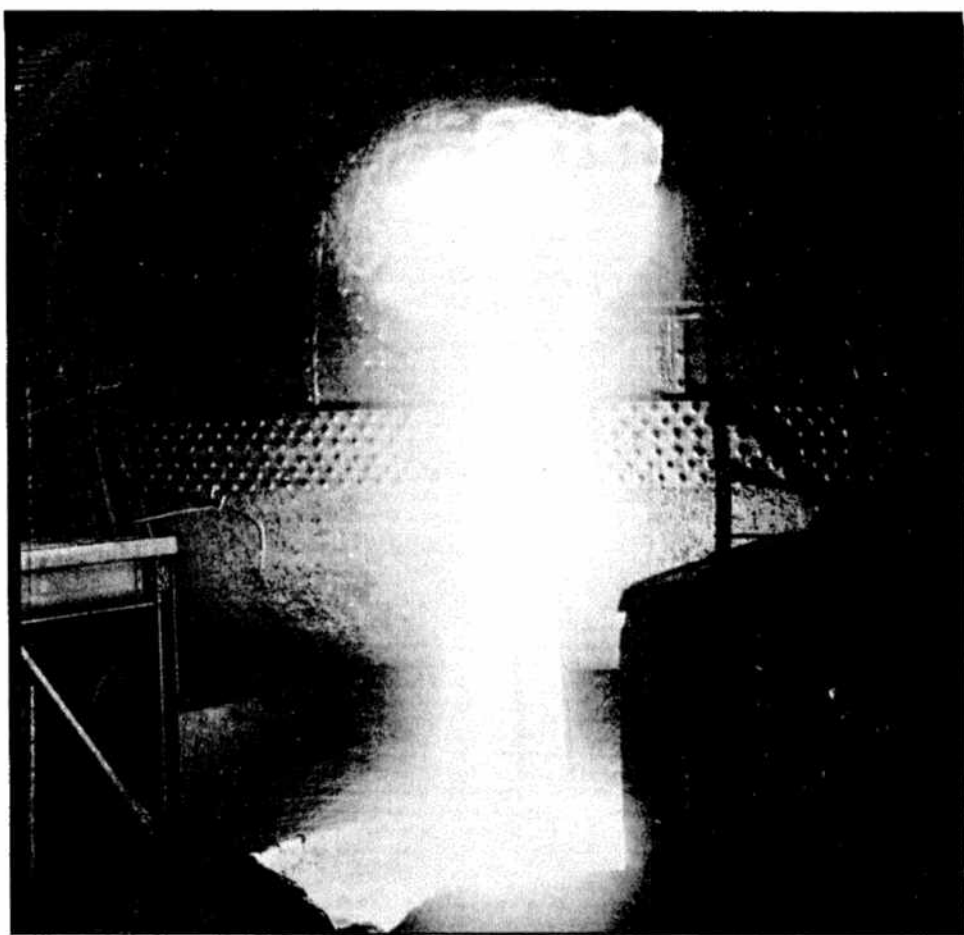
Soon after this, however, the iron content of the charge becomes much smaller, and the matte in the converter becomes richer and richer in nickel and copper, for, very fortunately indeed, as long as there is plenty of iron sulphide in the charge the air confines its attention to that objectionable substance, and leaves the copper and nickel sulphides untouched. As the quantity of iron sulphide present diminishes, however, it becomes necessary to shorten the length of each blow for fear of burning some of the sulphur out of the other sulphides. The amount of sand charged is also cut for there is now not so much slag to be skimmed after each blow. The converter is now on a "high charge" and will soon be ready to cast.

The converter can be filled only to a certain level; so, as the amount of iron removed becomes ever smaller, it becomes increasingly difficult to make room for the addition of more furnace matte. When it has been filled to capacity with concentrated matte, then, the charge is about ready to be "finished up." In this final process of converting the skimmer's ability is taxed to the utmost, for everything he does from now on has a direct bearing on the quality of the final product.

"DIAMONDS" AND "FEATHERS"

There are several signs for him to watch at this time: a puncher's bar thrust into a tuiere and quickly withdrawn comes out coated with frozen matte. This coating will be jet black and quite shiny. From its appearance a good skimmer can usually predict with remarkable accuracy just how much more slag there will be to take off. This evidence is strengthened by the appearance of the inside of the converter. Usually at this time "diamonds" begin to make their appearance—brilliant liquid sparks which cling to the walls and roof of the converter and occasionally shower down upon the surface of the charge. The slag, too, has a characteristic appearance: considering the scarcity of iron in the charge it is apt to be rich in silica from the excess sand. In such a case "feathers" show up. These are the "streamlined" feather-shaped icicles of slag that form on the under side of the slag stream while skimming.

After one or two blows of 25 or 30 minutes during which no furnace matte was charged to the converter, the puncher's bar will usually be very black and very shiny and show an occasional metallic streak where it scraped along the side of the tuiere while passing through. When this streak becomes bluish or purplish in color the skimmer watches it very carefully for the charge is nearly finished. With about five more minutes of blowing left a tinge of tan or yellow will creep into the purple streak; and when this is quite definite the skimmer turns his converter down to skim off the



Converter Pouring Slag

The skimmer has spotted "diamonds"—brilliant liquid sparks which cling to the walls and roof of his converter. Also he's noticed "feathers"—feather-shaped icicles of slag that form on the under-side of the slag stream when he is skimming. So here he's pouring one of the final ladles of slag from his converter before he starts casting matte. But read about those tricky big converters in Nathan Crawford's article on this page.

last slag. This slag is usually very thick and leathery, and difficult to skim off completely. So when all that is possible has been poured off, the converter is turned back so that the tuyeres are just a little above the surface of the charge and a little air is turned on to blow over the surface and freeze it. This makes it possible to pour out a ladle of clean matte from under the frozen slag, and this matte, the first ladle of the "cast," is carried by crane and transfer car to the casting aisle behind the converters where it is poured into molds and allowed to cool before being taken to the Orford building.

TESTING THE SAMPLE

At the molds a sample is taken in a small steel spoon and cooled in water. It is then carefully inspected for color—the proper shade of metallic tan; "feel"—rather rough, yet "soapy;" for its grainy texture, and for the ease with which it breaks. Skilful shift bosses and skimmers can judge to within a fraction of one per cent. the sulphur and iron content of the matte from this inspection of the sample. If the first ladle is okayed, which is usually the case, the rest of the charge is cast, leaving the converter empty and ready for another charge of furnace matte.

There are three nickel reverb furnaces supplying matte to the nickel converters. This matte contains about 13% nickel and

7% copper, the rest being iron and sulphur. It is treated in seven or eight of the converters whose final product, hundreds of tons of it daily, contains about 50% nickel, 26% copper, 23% sulphur, and 1% iron. The nickel and copper are in the form of sulphides for in this form they are best suited for the Orford process which follows.

The removal of iron sulphide by the mere process of blowing air through the matte to be treated, makes the converters one of the most economical and efficient, and also one of the most interesting departments in the smelter.

ADDITION TO C. C. SMELTER

(Continued from Page 1)

now being installed, are ready for the operation of one of the reverbs. The conveyor system includes about a mile of rubber belting, widest of which is 72 inches, longest stretch of which is 1,260 feet. More than 170 motors go into the electrical circuit, supplying more than 4,000 h.p.

Four of the seven new converters are ready for drying-out fires, which burn two or three days. Same size as the old converters in the nickel division, 35 feet long by 13 feet in diameter, they differ with larger openings calling for bigger hoods, have 59 instead of 48 of the valved air-inlets called tuyeres along their backs. One converter is being moved over from the nickel division to join them in exclusive copper production.

Laying of 20,000 tile and 7,000 brick closes up the east end of the addition to the reverb building, the final instalment in the housing of the copper division.

MANUFACTURING WIND

To supply air at 17-pound pressure to the copper division, two new Brown-Boveri blowers are being installed at the sub-station. Politicians might gaze with envy on these monster lungs; each has a capacity of 40,000 cubic feet of air a minute, yet takes less than half the floor space used by an older unit with a capacity of only 20,000 cubic feet. Conductor of this artificial wind from the sub-station to the plant is a blast line, five feet in diameter in its largest section, of 20-inch diameter where it contacts the converters, containing 260 tons of structural steel and plate. Power to operate the blowers comes from two motors, each of 3,500 h.p.

Traffic cop between converters and chimney is the dust chamber which receives the gases, slows them down to a snail's pace so the dust they carry drops into hoppers in the bottom of the chamber. From these hoppers the dust is poured into cars, trundled over the larry floor, discharged into a conveyor, headed back for the converters like a truant boy sent back to school. "Full speed ahead" has been the Fraser-Brace construction cry on the dust chamber, and with many hands on deck this important auxiliary has been raised in record time. It measures 182 feet long, 81 feet wide, 60 feet high. Into its exterior walls and dust hoppers have gone 220,000 common red brick, into its interior walls 575,000 firebrick laid in special acid-resisting mortar.

Also hurried to completion is an addition to the coal plant to fuel the new reverbs, involving an increase in grinding capacity of 25 per cent.

INCO MUSIC SENSATION OF 1936 IS CONISTON BAND



From scales and arpeggios to the troublesome score of Cavalleria Rusticana in less than a year—that was the royal road to music covered by Coniston Band.

Making its official debut as guest artists at an INCO Amateur Night contest before 2,700 people in Stanley Stadium August 11, this versatile young organization "oomphed" its way into the spotlight, and has held it ever since.

Re-organized September 19, 1935, it was placed under the gifted leadership of Dan Totino. Many of the members couldn't play their instruments—Totino taught them despite themselves. Now they reel off things like Handel's Largo, Brahms' Hungarian Dance No. 5, Mignonette, gems from the opera Norma, spots from Faust.

NOW HAS 28 MEMBERS

The group started with six members, had

24 for Triangle's photograph, now boasts 28. Each member contributes personally toward the band's expenses. Three nights a week the full band practices; other nights various sections gather separately for instruction from Maestro Totino.

Here they all are, left to right: Back row, A. Gobbo, R. Martin, T. Ferra, G. Sartor, G. Baggio, E. Charette; centre row, standing, G. Gentile, A. Franchetto, P. Martin, L. H. Hunt, T. Abbott, J. Hunt, T. Oliver; seated, A. Lemieux, E. Modesto, S. Sottile, M. Battistuzzi, Dan Totino, J. Mislinski, F. Benadetti, M. Solski; front row, P. Chomacchio, I. Toniolo, H. Smith, J. Serantola.

Members of the committee behind this energetic and successful organization are: W. A. MacDonell, F. Murphy, E. T. Austin, Frank Parker, Paul Hugli, A. Desautels.

MILL'S ORE-TAMER IS CRUSHING PLANT

When ore is delivered from the mines into the 10,000-ton receiving bins at Copper Cliff concentrator, the largest pieces are not over six inches in diameter, but it would be rather difficult to secure results from a delicate flotation process with chunks that size.

So the first step is to put it through the crushing plant, from which it emerges with a maximum diameter of one-sixth of an inch.

THE ORE-TAMER

Tough customers though they may be, Frood and Creighton ores soon give up the ghost when subjected to the hammering and battering they get in the crushing plant.

They are first drawn from the receiving bins and carried to the Symons crushers by a series of conveyor belts. At the discharge end of certain of these belts are large electro-magnets, whose purpose is to lift out any tramp iron which might be present in the ore, such as hammerheads and drill steel, which might damage the crushing machines. There are two stages of actual crushing, and the Symons crushers constitute the first stage.

To employ a very elementary illustration, a Symons crusher may be likened to an animated toad-stool. It is a very large toad-stool, of course, the total machine weighing some 65 tons, and some of its parts being made of the toughest of manganese or nickel steels, but the crushing element in the machine does have a shape very similar to that of a toad-stool.

In operation, the bottom part of the stem describes a circle, and this imparts a gyratory motion to the upper part. All this is enclosed in a stationary housing. Between the fixed part and the movable part, there is a decreasing annular clearance, varying from several inches at the top entrance, to a minimum of only three-quarters of an inch at the bottom discharge.

The ore is poured in on top of the dancing toad-stool and is shaken evenly, over the rim. Each rock is nipped and squeezed and shaken down by the gyratory motion, and no piece can escape except by passing through the three-quarter inch annual opening at the bottom. There are three of these machines.

400 TONS AN HOUR

The observer, watching one of these machines in operation, would see a stream of ore with pieces up to six inches in diameter, pouring into the top at the rate of 400 tons an hour, or one ton every nine seconds. At the bottom, he would see that same stream of ore streaking out on another belt, with the pieces three-quarters of an inch or less in diameter.

This completes the first crushing operation. Before passing to the second, the ore passes over a battery of electrically vibrated screens, which screen out that part of it which is less than a sixth of an inch in diameter. There are eight screens in this primary battery; each has a surface roughly 3½ feet wide by five feet long. The screens are set at an angle of 38 degrees and make 3,000 vibrations per minute.

That portion of the ore which is able to pass through these screens falls upon another conveyor system and is taken to the concentrating section. That which is still too coarse to pass through the screens is conveyed to the second stage of crushing. This stage consists of five Traylor rolls.

Again resorting to an elementary illustration, the rolls operate like the ordinary household wringer on washday. The rolls are covered with heavy tires of alloy steel, 6½ feet in outside diameter by 18 inches wide. Each pair of tires weighs 10 tons. The total weight of the machine is about 150 tons. Each tire is mounted on a heavy forged-steel shaft and is driven by a 200 h.p. motor, making 400 h.p. for the total machine.

Like a wringer, the two rolls revolve toward each other, and at equal speed, running about 108 revolutions per minute. They are set practically face to face, and a continuous ribbon of ore passes between them and is crushed by direct squeezing and pressure. The rolls can spread further apart only by overcoming a spring pressure of 36,000 pounds per lineal inch of roll face. This is the squeezing pressure which is brought to bear upon the ore.

Each machine crushes about 275 tons of ore per hour. With three and sometimes four machines in operation, the capacity of the roll plant averages about 1,000 tons an hour.

SECONDARY SCREENS

The product of the rolls returns by conveyor to a battery of 24 secondary screens, identical with the primary screens already mentioned, of the same size, and with screen cloth whose width of opening is also about one-sixteenth of an inch. All of the material in the roll product which is fine enough to pass through the screens now does so, joining the undersize of the primary screens and passing on to the concentrating section. The oversize of the secondary screens is simply conveyed back to the rolls for a second pass, repeating the journey as many times as may be necessary to become fine enough to pass through the screens. The circulating load in this circuit is just about 200 per cent., that is, on the average, all of the ore returns twice to the rolls after its original passage through them.

This completes the crushing operation, but there is one other feature of the crush-

ing plant which is worthy of particular mention. This is the provision for collecting the dust which is formed, and which might otherwise pollute the atmosphere and create a condition hazardous to health. The production of dust is inevitable in the fine crushing of dry rock, and it is both impracticable and undesirable to add any water to the ore at this stage of the operation. However, the dust can be—and is—prevented from getting into the atmosphere of the building, because a complete dust removal system was incorporated in the original design when the crushing plant was built.

EQUIPPED FROM START

This is believed to be the first ore-crushing plant of major size on the North American continent to be so equipped from the beginning. Many crushing plants nowadays have dust removal systems which, however, were added some time after the plants were built.

In the Copper Cliff crushing plant, a system of dust pipes interlaces the entire crushing and screening buildings, with at least one pipe reaching to every chute and every screen and any other point which the ore is sufficiently in motion to cause dust to rise. These pipes all lead to a common header, and a constant suction is maintained upon the system by means of a ventilating fan, which draws 50,000 cubic feet of air per minute from inside the building and discharges it outdoors.

RECOVER DUST

This is equivalent to changing all of the air in the plant every 20 minutes. Just before it reaches the fan, the confined dusty air in the pipes is drawn through a water spray tank, and the mineralized dust is recovered as a wet slurry which flows over to the concentrating section. The dust collecting system effectively maintains a clear atmosphere in the crushing and screening plants, so that the health of the men is safeguarded.

MINSTREL OF PIONEER DAYS

Second-longest continuous service with INCO is the distinguished record of John Gribble, Copper Cliff veteran, who acknowledges working seniority only to the 44-year record of Wm. Zinkie, Copper Cliff substation.



John Gribble

pany on June 14 of that year, and has missed very few working hours in the 41 years years since.

He started as a drill helper at the No. 1 mine, but six months later became time-keeper in the Evans mine, then a year after that was called to the general office. Since 1907 he has been cashier. He has three daughters and one son.

A musician of skill, he has been actively interested in the musical organizations of the nickel district and few of them do not bear the imprint of his influence and enthusiasm.

PRESENTED WITH WATCH

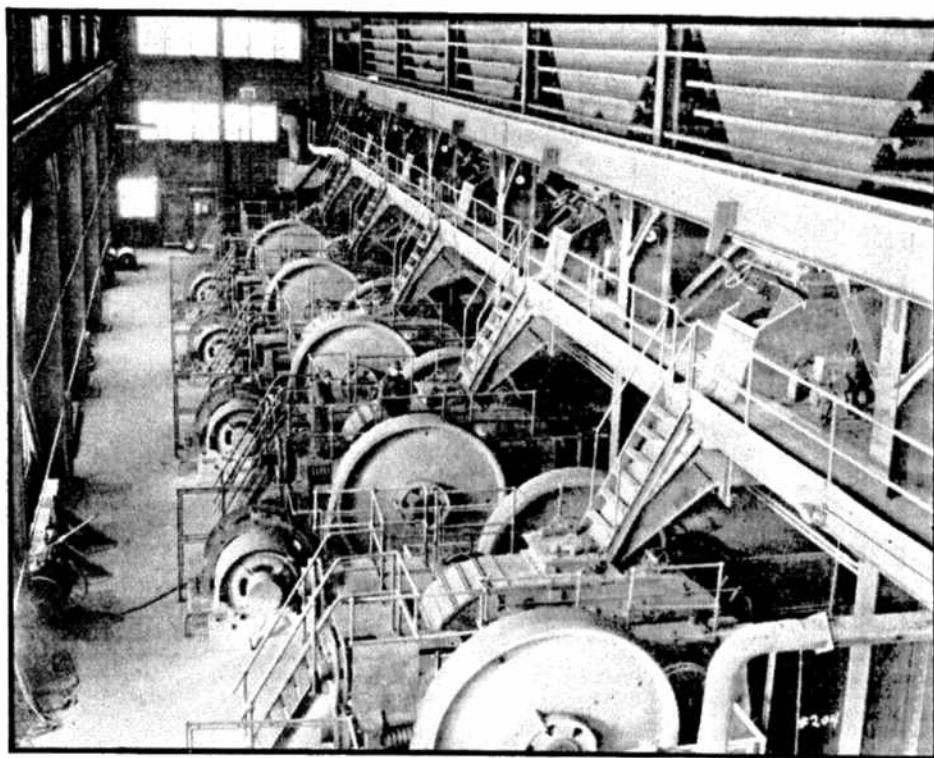
Two or three days after his arrival in Copper Cliff he was the community's official organist, presided at all consoles regardless of denomination. Six months of such service found the town so appreciative that, at a surprise party in the Hambley home at Evans mine, Catholic and Protestant congregations combined to present him with a handsome gold watch which, like its owner, is still ticking strong.

In 1918 he transferred to the choir of St. Andrew's Church, Sudbury, became organist until the arrival of E. B. Beattie. Returning to Copper Cliff, he was at the United Church console until 1931, conducted the 97th Regimental Band.

Second only to music as a hobby he rates soccer, is a familiar figure at all exhibitions of the pigskin pastime in the district, denies that one year they didn't hold the championship match because he was unable to attend. Pressed for reminiscences, he doesn't pick out anything in particular from those 41 years, says "Whenever anything happened around Copper Cliff, I wasn't far away."

MONEL FOR LIFE-SAVING

A new life-saving gun, for throwing life-lines at sea, shoots projectiles made of Monel metal, because it alone of all metals tested resists corrosion from salt water and salt air, and will not "mushroom" when the charge is fired.



It's the Squeeze Play!

If you think the laundry is hard on your shirts, imagine how Mother Earth feels about the way the Copper Cliff concentrator treats her ore-children. Like giant household ringers these Traylor Rolls revolve toward each other at about 108 revolutions a minute, and the unfortunate ores, passing between them, get squeezed to the tune of 36,000 pounds per lineal inch of roll surface.

WHITEHEAD'S PLANT ACTIVE

(By HALVERT LINTVEDT)

The Whitehead Metal Products Company of Canada, Limited, constructed a factory at Port Colborne, Ont., in February and March of this year, for the purpose of manufacturing Monel Metal range boilers and automatic water heaters with Monel Metal tanks, similar to those manufactured at the Cambridge factory of the Whitehead Metal Products Company of New York, Inc.

HEALTHY OUTLOOK

The tremendous success of the Cambridge factory, the high import duties from the United States to Canada, and the promising outlook for Canadian business are the combined factors which caused the forming of the Canadian Whitehead Company and the factory at Port Colborne.

The history of the Cambridge factory is that of a continuous expansion.

The first water heaters with Monel metal tanks were built about four years ago. About that time the Whitehead Company had just completed its new four-storey building at Cambridge, Mass., and the manufacturing department for Monel metal water heaters occupied about one-half of one floor in the new building and the production was about 300 water heaters per month.

RAPID EXPANSION

In January, 1933, the installation of new machinery for making Monel metal range boilers and tanks by resistance-welding was completed, and a program was set up for making 1,000 range boilers and 400 water heaters per month.

This program seemed rather optimistic at that time and quite a few of us probably thought "it is grand as long as it lasts." But we were unduly pessimistic.

The next year the program was for 1,500 range boilers and 600 water heaters per month, and at the same time preparations were being made for the manufacture of Monel metal pails and Monel metal custom-built sinks and cabinet taps. The manufacturing department at that time occupied three floors of 18,000 square feet each. At the present time the Cambridge factory is occupying the three floors in the original building and in addition another three-storey building with about the same floor space. The production is 3,000 range boilers, 2,000 water heaters, 1,500 pails and 100 custom-built sinks per month.

FIRE INTERVENES

The Canadian factory started in very promisingly, and worked to its capacity during the short period it was in operation before it met with a disastrous fire June 2nd, 1936. The building was destroyed completely, also the finished stock of range boilers and water heaters. Most of the machinery and supplies were salvaged and have been reconditioned. A new structural steel building with brick and tile walls and Haydite roof has been erected on the same site. The new factory was completely finished and ready to start operation six weeks after the fire.

The program for production at the Canadian factory is about the same as the initial program for the Cambridge factory, or about 400 units per month. The producing capacity of the factory may easily be increased to 1,000 units per month and we hope we will be shooting at this mark some day soon.

SAFE SAFETY PINS

Even the safety pins for fastening the fabric on the reels in a big New York dye plant are made of Monel Metal to eliminate all danger of rust or verdigris stains.

Construction of New Lab. Underway

Although fall weather has been responsible for many delays, construction of the new INCO research and plant laboratory is proceeding on the site next to the general office at Copper Cliff.

The building will have a frontage of 155 feet. Two wings, each of one storey and basement, will be 35 feet by 87 feet and 35 feet by 123 feet. The centre portion will be 85 feet by 60 feet, will have two storeys, attic, basement.

Foundation walls and footing will be of reinforced concrete, and the floors will be concrete on steel beams with mastic floor tile covering. Area of the first floor will be 12,500 square feet.

Exterior walls will be of tile and brick veneer, interior walls of tile, service walls of four-inch tile with a two-inch space between walls. The roof will be of Haydite with asphalt slate shingles.

Services in the building will include air-filtering and washing equipment, elevator to serve all floors, inter-office communication system, gas piping, compressed air, vacuum system and distilled water equipment, and both a.c. and d.c. power.

LIBRARY REMODELLED

Familiar landmark since 1902, when it was erected as a general office for the International Nickel Company, Copper Cliff's town hall has undergone extensive remodeling.

Thus the seat of municipal affairs keeps pace with the change of scene about it. Now opposite it are the lawns and flower beds of Nickel Park, but back in the early days it looked upon machine and carpenter shops and, back of them, an unclaimed swampy area.

In the large upstairs quarters the Copper Cliff library has a remarkably fine selection of books. More than 400 new titles have been added to the previous stock, and now the shelves carry a satisfactory range for people of all ages and literary tastes. The library is open every evening except Sunday from 7.00 to 9.00 o'clock.



Shipping Dept.

Here are the men who cooper, weigh, check, and load a car of refined nickel every 20 minutes when schedules must be met at the Port Colborne plant. Efficient and proud of their efficiency, they use loading equipment devised by the General Superintendent and his assistants after their personal experience loading nickel during the time the plant was closed down in 1932. Left to right: on locomotive running board, Ed. Noyes, Ed. Cooke and Gordon Noyes; front row, A. Weaver, L. Houser, C. Misener, D. Potkonjak, J. Krajonovich, E. Grace, A. Misener, J. Tkac, J. Lipovsky, R. Barrow Jr., K. Krokowski and R. Barrow Sr. The Barrows are another of those successful Port Colborne father-son combinations.