

Haif a mile away a slag-train dumps its load of molten waste, and for a few seconds the winter's night gives 'way to the flaming reflection, a familiar sight to district residents, but a picture of rare beauty to visitors. Soft pastels of coral, rose, and red bathe the sky and snow-covered rocks, and bring out in deep silhouette the Copper Cliff smelter and its three huge stacks, waving their white plumes of prosperity over an industry which means "Merry Christmas" directly to more than 30,000 Canadians.

## 29.6 ACRES IN ROOF AREA

If all the roof area in the Copper Cliff smelter and concentrator were laid out flat in one place, it would cover a space half as big again as Nickel Park.

With the smelter addition completed, the total area of the roofs in the Copper Cliff plant is 29.6 acres, or 1,286,256 square feet. And now, from the entrance of the Orford building to the east end of the converter building, it's a total stroll of 2,150 feet. **Aterry Obrightmag!** In an organization as large as the one for which we work, it is

impossible to retain the personal touch as closely as in smaller companies, which is very regrettable but nevertheless inevitable. I am therefore keenly appreciative of the invitation extended to me by the Triangle, our employees' newspaper, to send sincere Christmas greetings to each and every INCO employee.

May you and yours enjoy a happy Yuletide!

evaniel

## RETIRE ON INCO PENSION

On December 31, two more veterans of INCO service will punch out for the last time, say farewell to familiar duties and faces, and turn to a new chapter in their experiences—life in retirement on the generous pension scheme provided by the Company.

#### IN FINE HEALTH

They are A. J. Webb, of Copper Cliff

#### NEW EQUIPMENT READY

The seven new converters and the two new reverb furnaces of the copper division, with all their auxiliary equipment, are either in operation or ready for it. Fraser-Brace construction crews, well ahead of their schedule, are putting the finishing touches to their big contract, and the INCO engineering and operating departments are coordinating the new equipment and working it into its circuit.

Nearing completion is the extension to the cooling aisle of the Orford building, which will provide an additional 13,125 square feet of floor space, to be served by another 35-ton crane.

#### POSTPONE LAB.

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Foundations are complete for the new research laboratory building next to the general office, but further construction has been postponed until next spring.

At the west end of the yard a new 200ton 50-foot fulcrum scale is being installed, capable of weighing a full carload of raw materials.

A mathematical acrobat, with a couple of adding machines and a fondness for boxcar numbers, has worked out some interesting sizes and quantities for Triangle readers on the 1936 additions at Copper Cliff: Total excavations made during the job,

Total excavations made during the job, 85,000 yards, or one hole in the ground 130 feet wide, 130 feet long, and 130 feet deep. Concrete, 28,000 yards, or enough to lay a sidewalk five feet wide, four inches thick,

(Continued on Page 5)

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Construction and a construction of the second secon



smelter's ore bins, and James Crossgrove, of Copper Cliff sub-station. Both in excellent health, they look forward to many years of leisure and contentment. Mr. Webb will look after private interests he has acquired. Mr. Crossgrove expects to leave next spring with Mrs. Crossgrove for an extended holiday trip to their native Scotland, after which his plans are indefinite.

Triangle found Mr. Webb in his comfortable Elm St. home in Sudbury. It turned out that Creemore, near Collingwood, was his birth-

place, and the year was 1868. After some years of partnership in a photographic enterprise with his brother, who became a noted photographer, "Jud" Webb came up to Copper Cliff in 1901, went to work at the Orford Refining Co. plant, which stood on the site of what is now the Matheson wood yard. He trans-



"Jud" Webb

ferred to the West Smelter, which, June 14, in 1904, was destroyed by fire, so he and other smelter men were sent to the Mond Nickel Co. smelter at Victoria Mine where

(Continued on Page 5)

#### Within the INCO TRIANGLE

#### December, 1936

## **TELL TRIANGLE**

## Port Colborne

Page 2

and the second second

After one of the best seasons in the histhe Port Colborne Plant Softball the "Bridges" of the Electrolytic ent were crowned champions for League, the Department second successive year. This year the opposition was much stiffer than last and theirs was a well earned triumph.

The final playoffs for possession of the R. C. Stanley Trophy were real battles and the team from the Monel and Carpenter shops carried the series to the fifth game before bowing to the Champions.

The "North Ends" team served notice this year that they will be very much in the hunt next summer and have adopted as their battle cry "Low Bridge," so beware Bridges,

The Machine Shop were handicapped during the season due to overtime work and were not able to field their strongest team, but are now in training for next season.

"B Shift" and "C Shift" teams are expected to make some major league affiliations during the winter months and promise to be back bigger and better next year.



The Bridges smile serenely at all this as will be seen in the accompanying photo in which the Champs are shown reading left to right:

Front row: Freeman Brennan, catcher; Charles Misener, outfield; Johnny Tupechka, short stop; Don MacDonald, manager; Orval Gonyou, outfield; Les. Heard, pitcher.

Back row: Bob Morrison, first base; Stan Munroe, outfield; Doug Runions, second base; Roy Walters, outfield; Louis Brema, third base; Bill Roach, pitcher.

¶ Edgar "Buster" Dunn had the misfortune to have a bottle of sulphuric acid break while he was mixing it. This happened on the pachuca floor of the Electro. Some of the acid burned his clothes and some ran through the cracks of the floor to the cathode box department below. After removing his acid soaked clothing and rinsing himself off, Buster went below to see what had happened there. The acid was dripping on a workman who pooh-poohed the warning to remove his clothes and wash off the acid. He thought Buster was pulling a fast one and that it was only water coming through the floor. A short while later Buster passed that way to find the workman's clothes in tatters. Fortunately, no worse damage was done and as it was pay day, the clothes could be replaced. It was remarked that 'he absorbed some chemistry for once.'

Another workman at one time remarked to your reporter that "he hated to see any-one too careful." Your reporter is glad he Your reporter is glad he does not work beside this man.

Among those on the calling list of the stork were Mr. and Mrs. Alex Eged, a son, Alex Jr.

Both five and ten pins are popular with the Electro Dept.; further reports later. Harold Patterson had seven straight strikes ten pins and finished with 245

Wilfred Thompson won two chickens for 1934 Thanksgiving and a turkey this year. He says the INCO A.A. is also going to buy

Electro extension, son of John Warren Sr. painter foreman, met with a fatal accident November 23. He was walking on the road between Fonthill and Welland when he was struck by an auto.

When you are willing to learn more, you are preparing yourself to earn more. ¶ Don't count on your drag or it will pull you under.

I Last fall a few enthusiastic members of the Port Colborne INCO Club entered teams in the local Billiards and Cribbage League. Unfortunately they were unable to entertain their opponents on their return games, due to lack of clubhouse accommodation, worse still, being sans billiard table. and However, due to the generosity of their strongest opponents in the league, the "Legion," all INCO games were played at Legion quarters and here's where the rub comes in. INCO won the cup for billiards on borrowed plumes or furniture or some-At cribbage they did not fare so thing. well, but the same gang are off to a good start again, same terms, same faces, same places.

### Coniston

Married: On November 17, J. Bloemmen, well-known electrician, and Eva Cataphore, of Sudbury, who will reside in Coniston: on November 24, Arthur Johnston and Nora Barnes, of Sudbury, who will reside in Sudbury

Conistonite: On November 12 to ¶ New Mr. and Mrs. Ovila Lalonde, a daughter, Georgette.

¶ John Stacey, boiler shop foreman who has been in the employ of the company for 29 years, has been confined to his home with bronchitis. from which we are wishing him a speedy recovery.

## Creighton

On the first day of the hunting season Andy Petrenko and Mike Cushnir each bagged a deer. They started out at 7.00 in morning and had their kill by 11.00 o'clock, 180 and 220-pound bucks, 14 miles beyond Whitefish Falls. Andy has only missed one year getting his deer, and that was last year when he didn't go out. Bert Behenna was another local "Daniel Boone" who spent a week in the bush looking for deer, but he returned empty-handed.  $\P$  E. Pera and family left the latter part

¶ of November on a trip to Finland. The open-air skating rink is now in full ¶. swing, and many local enthusiasts are

making full use of it. C. J. Niemitz and Katie M. Macky were

wed at Creighton on November 21, Rev. G. Morrison conducting the ceremony.

( Recent arrivals: 10 mr. and arry, 1) Whissel, a son, on December 3; to Mr. and Recent arrivals: To Mr. and Mrs. J. W. Mrs. M. Cavrak, a daughter, on November 17.



It is reported that Jack Moss, popular ¶ manager of the O.R.C. hockey team, while bear hunting in the vicinity of Lake Penage, discovered a new species of "belled" wild animal. Jack gave chase to this animal but it proved too fleet and we understand is still large.

Several deer hunting parties that were ¶ much more successful during the open season were reported as fellows:

¶ Jimmie Pernette and Doug. Butchart at McGregor Bay; H. A. MacDougall, L. F. Kitchener, and Jack Duncan, at LaCloche Island; J. C. Bischoff and B. C. Armstrong, at Bigwood.

Copper Cliff

Recent newlyweds: Violet E. Thorne, of Toronto, and J. Lawrence Watts, on Novem-ber 3, will reside in Sudbury; Marion Jean Brown, of Toronto, and J. H. Patterson, on November 28, will reside in Sudbury. ¶ Louis Scanlon spent the week of November 28 on a hectic deer-hunt around

Callander. He spotted five little dears, but they were the Dionne sisters. Herb Sands went to Montreal for a Maroon-Bruins hockey match to check up on his brother Charlie, one of the Boston club's ace performers.

Jack Turnbull was one of a party of our who went hunting for a week in the Penage territory and each bagged a deer.



Jerry Ovens believes that a good way to keep the wolf from the door is to shoot it. About three miles from Copper Cliff he brought down this big brush wolf, and cashed in on pelt and bounty.

G Bill Birney is back at his post after an enjoyable holiday jaunt to Buffalo, Detroit and Toronto.

Wed on September 16 were Vito Masoti and Dina Fornasin, of Coricizza di Codoipo, province of Udine, Italy. Their honeymoon trip took them to Rome, Venice, Florence, Padova, Assisi, and other points. They are residing in Copper Cliff. ¶ The day after Christmas, at Windsor,

Leo Racicot and Emma Sharkey will be married. On December 14 Charlie Rovanelli was wed to Mary Castanza.

Another who has bagged his deer count this season is A. McNeil, who dropped a 220-pound buck after a half-hour walk from his car on the Skeed road.

¶ Mr. and Mrs. T. C. Wheatley have returned from their honeymoon trip following their marriage at Albany, and are making their home in Copper Cliff.

Joe Sanchione, one of the reverb building's oldest tappers, has used the same trowel for making clay buds for the past 12 years.

One of the largest deer seen or shot this season in the district was brought down by Reg. Wainman. It weighed 250 pounds dressed, and the horns, which he is having rounted, measured 30 inches across.

Two Saskatchewanites were wed November 25 when the marriage took place of Mary Musyka, of Wynyard, and Mike Wetick, of Ethelbert. They are living in Sudbury.

G Recuperating from an attack of pneumonia, W. C. MacPherson has gone to his home at Walford, Ont., for two weeks. Two weddings of unusual Copper Cliff interest: November 25, Howard Gegear and Frances Cooke; October 29, Gordon Henry and Lorna Blackwell.



Tom Strong bagged a deer of a different shape when he was returning in his car from a trip to St. Catharines. Near Verner he collided with a cow, and brought home beefsteak instead of venison. Beefsteak, he says, is more expensive. ¶ During the fall months Joe Decoteau

lived in a cottage on the Soo Highway just west of Whitefish. Having heard of Paul Bunvan's remarkable exploits, Joe decided he had the perfect setting for a slice of the same fame so, during duck season, he'd rise in the early dawn, pick up his shotgun, step to the door in his pyjamas, and let fire. The Decoteaus had duck every day during the season. Well, almost

Mr. and Mrs. Frank McKain motored to Noranda during Frank's vacation, and visited both the Noranda and Beattie properties.

Few will envy Phil Graveau and Morris Boulay the experience they had hunting rabbits in the bush between Stinson's Pit and the Wahnapitae River. While Phil waited for him, Morris made a drive along a nearby swamp and ran into what was probably the last thing he either expected or wanted to find-a man hanging by the neck in a tree. Morris quickly saw that the man was beyond medical assistance (medical authorities later pronounced him dead since last March) so he hurried back to find Phil. When the two tried to return to the spot, they couldn't find it, and Morris was promptly accused of day-dreaming. Later, however, he was able to lead police to the scene, after a long search.

¶ Jas. Shrigley presented the boys with cigars on the arrival of an eight-and-a-half pound son, October 24. Other recent arrivals: To Mr. and Mrs. Thos. McGui November 28, a son; to Mr. and Mrs. Joe Gauvin, October 21, twins, boys. ¶ Married at Sudbury on October 24 were

Ruth Hall and Martin Lemke; at Sudbury also on October 24, Norman Green and Patricia Brunett; at Arnprior, Grace Mc-Nulty and Mel Slater; the blushing bridegroom is well-known as a former Copper Cliff hockey player who is performing this season with Atlantic City Seagulls.

¶ Howard O'Brien came smiling through with a 280-pound buck after a successful hunting trip on the other side of Lake Wahnapitae. Fred Savage was another INCO nimrod who made good, bagging a 160-pound spikehorn buck on November 2. Aaro Mikkalo also spent a week in the bush and came home well-venisoned.

Three Copper Cliff INCOites were suc-¶. cessful in the municipal elections on December 7. C. Brownlee and R. Convry, December 7. C. Brownlee and R. Convry, were elected to the council in McKim town-ship, and Roger Trahan was elected an alderman for Fournier Ward, Sudbury.

 $\P$  Mrs. I. J. Buisson, whose husband has been patrolman on the high tension line at Naughton for some 20 years, underwent an operation in Toronto on December 4 for the removal of a cataract. The eye had to be taken out.

The marriage took place on December of Robert Mitchell and Bernice Manning. On November 17 a group of the happy brideto-be's girl friends from the general office entertained in her honor at Copper Cliff Club, presenting her with a crystal set.

 $\P$  E. A. Whistle received an aldermanic nomination for Fournier Ward, Sudbury, but regretted having to withdraw on account of the press of other obligations.

Frood

A healthy young recruit arrived for the INCO police force when Constable John Alexander McPhail reported for duty at the home of Mr. and Mrs. Jack McPhail.

 $\P$  After many an unsuccessful attempt. Rube Cook, rockhouse foreman, finally shot a duck, but it was shot so thoroughly he couldn't eat it, so he brought it to the mine as Exhibit A. Realizing this was a momentous occasion, perhaps never to be repeated, the boys rallied 'round and presented Rube with a handsome medal. The decoration was a work of art, copper plate against a background of beautifully grained black boot leather. G.B.S. (meaning Sullivan, not Shaw) has built himself a home in Sudbury, having wearied of the good old landlord-tenant racket. He'll be planting his own fig-tree in the garden next year. Married: On November 8, Fred Dim and Teresija Kocevac, of Slovenija, Yugoslavia, who will reside in Sudbury; on September 30, Tom Lichacz and Ethel Worbeck, of Roblin, Man., also Sudbury residents. ¶ Jack Treasure has been building himself a fine-looking house on Baker St. ¶ Recent arrivals: To Mr. and Mrs. W. Matison, November 7, a daughter; to Mr. and Mrs. Barney Boyle, November 9, a daughter; to Mr. and Mrs. W. Campbell, October 26, a son; to Mr. and Mrs. Patrick

his Christmas dinner.

I Employees on the shift of A. A. Mac-Donald welcome him back after a long illness.

The INCO A.A. entry in the Town Five-Fin League won the play-off of the first tournament of the season. The winning team: R. Thompson, W. Thompson, Alex Herrick, Glenn Winger and Jas. Emburgh. It is better to be five minutes late in this world than to be 25 years early in the

Born: To Mr. and Mrs. Art Thompson, November 7, a daughter.

Ten employees attended the Canadian Corps Association re-union banquet at the Royal York Hotel, Toronto, on November Fifteen hundred returned men from all over the Dominion were there.

Two of the new golfers, Nipper Wilson and Ponso Davidson, have become so enthusiastic over the golf swing that they have introduced it for swinging the sledge for tapping the furnaces, breaking slag and also for sweeping the floor. "Dutch" Steve Kollus, Louis Hovarth, Bill Lee, Frank Colangelo have learned to take the proper stance, straight left arm and relaxed body motion when addressing the bar. Tony "Peanuts" Petroff and Johnny "1.66 cu. ft." Colangelo don't seem to have mastered the follow-through yet.

Cranemen have been instructed to hoist their loads a foot higher for transfer, since the new messenger, Bert Richardson (6'5"), has started work.

¶ Arnold Taylor is the proud father of a bouncing baby boy.

¶ John Warren Jr., employed in the

¶

With the first half of the interdepartmental bowling schedule completed, we find the Shops in first place and the Yard and Office No. 1 teams tied for second place. On the morning of October 27th. the home of George Furchner, at Minnow Lake, was completely razed by fire. George, his wife and two children, just managed to escape with their lives. While no one was actually burned, Mrs. Furchner suffered slight injuries when thrown down by the force of an explosion which occurred as she was leaving the burning building.

¶ Harold Kurtz, of the Mechanical Department, was observed celebrating on the eve of November 9th. It was later learned that the occasion was the arrival of little Caroline Gail.

¶ H. Clements and Paul Coulombe, of the Electrical Department, spent their vacation seeing the sights in the "windy city." Thev were much impressed with the workings of the planetarium. Their friends have been warned not to pay any attention should they happen to notice them walking around gazing skyward. In all probability they will be just checking up on the sun, moon, and stars

¶ Bob Steadman, married October 28th to Irene Smythe, of Midland, was presented with a radio by his fellow-workers. ¶ Born: To Mr. and Mrs. E. Bendramin,

on November 26th, a son.

#### IN BIG BRIDGE

Almost 4,000 tons of alloy steel, containing approximately 31 per cent. nickel, went into the new San Francisco-Oakland bridge.

Lloyd King, Sam and Percy Dyce, Avery Beaudry, and Johnny Walker had a week's thoroughly enjoyed vacation at Big Bear Lake. Highlight of the outing was an aquatic race between a buck, a hound, and Avery in a canoe The deer won; Avery and the pooch were tied. The weather being so mild, the boys just brought back two deer with them. Photo shows proud Lloyd King with one of them. Note the spread of antlers.

¶ Hunting at Long Lake, F. Jordan, J. LePage, and R. LePage each got a deer in less than three hours. The Jordan victim probably establishes a record: It was a seven-point buck, and weighed 308 pounds dressed. A. Foisey got a bull moose near Wahnapitae the week of November 16, but Thompson, November 24, a son, Patrick Peter; to Mr. and Mrs. J. D. McPhail, on November 28, a son, John Alexander.

Reg. Sindon and Theresa Charron, of Sturgeon Falls, were wed October 26. The well-known bells will, it is said, be ringing out soon for Jim France, popular football goalkeeper.

¶ With the opening of Garson Mine, it's probable that Jim Harley will be getting his powder-box snowshoes out of storage. Harley, when in Garson, rode through the deep snow to work on baby toboggans made of powder-box lids.

¶ Rumor had it that Tom Peacock was carrying a rabbit's foot in his pocket. When he clicked three times in the football sweep, it seemed a pretty good idea.

H. J. Cullen was elected an alderman for McCormick Ward, Sudbury, in the elections December 7.



Nickel Company of Canada, Limited. EDIFORIAL OFFICE COPPER CLIFF, ONT. Don M. Dunbar, Editor

VOL. 1, No. 3 DECEMBER, 1936

### Øur Christmas

A name had to be chosen for their organization by the men whose vision charted the future of the nickel industry and whose courage and acumen have so unerringly steered its course. So they called it the "International" Nickel Company.

Undoubtedly the word "International" best described the importance they were determined to develop for nickel in world industry. But they could hardly have guessed how fittingly it would describe the large force of employees on the payroll today.

No less than 26 different nationalities are represented among INCO employees in the Sudbury area!

How does Christmas find them how does it find all of us—"within the INCO triangle"?

Christmas is a mellow time, when old recollections surge up from the wells of memory. Pioneer employees who contrast personal comforts and joys of Yuletide, 1936, with the Yuletides of 30 and 40 years ago, sigh with contentment and satisfaction. The march of the years has been kind to them in their jobs.

Christmas finds no joy in considering the misfortunes of others, but many among us who have come from other lands to join this "international" INCO family, cannot help at times comparing their own lot with that of friends and relatives across the seas where strife, suspicion, and sheer brutality will throttle and crush the Christmas spirit this 1936 Yuletide.

Christmas brings its eternal message of hope to youth. Young men with INCO can greet the 1936 Yuletide with confidence and security, remembering that while they have good jobs and a firm toehold on the future, there are thousands of other young men in this strange world who face a Christmas of empty prospects, thwarted ambitions, bitter despair.

Christmas is the time when the oldest and sweetest legend ever told reminds men of their universal brotherhood, and reunites them in goodwill. In the INCO family we are proud that goodwill is not confined to Christmas, but flourishes throughout the year.

Within the next month two more veterans from our ranks retire on the liberal pension scheme which the Company provides for them after their years of faithful service.

Recently another large group of INCO men received membership in the Quarter Century Club, and buttons acknowledging their 25 years of steady duty.

This issue contains yet another 's Group instance where the Company' Insurance plan for its employees brought peace and happiness to a home where tragedy had stalked. And every day brings fresh realization of the elaborate steps taken by the Company for our recreation, entertainment, and health. Taking it by and large, we're a lucky lot. And so when the glad bells ring out on Christmas morn, let's all draw closer to the INCO firesidegrateful for the mental and material security we enjoy; interested in our work; proud of the traditions which veterans have built for the industry of which we are a part; thoughtfully sympathetic for those far-off families who will spend Friday in terror of riot, revolution, bloodshed. On the front page of this issue Triangle extends the season's greetings in some 20 of the tongues spoken among us here in INCO. The translations may be inaccurate, but the wish is sincere. To an international family we give that international greeting, "MERRY CHRISTMAS!" And, as Tiny Tim rather aptly put it, "God bless us, every one?

### Aerial Views of INCO —No. 1—Garson Mine



In 1931, when the world depression greatly reduced the demand for nickel and copper, Garson mine was closed down, but the first week of this month a force of 30 men commenced exploration work there. Some 14 miles from Sudbury, the Garson property was formerly owned by The Mond Nickel Company, and came under INCO control when these two companies were merged in 1929. For the present time at least there will be no extensive program looking to production, although there will be a small output and the ore possibilities will be thoroughly examined. J. B. Fyfe, formerly at the Frood, and who superintended the sinking of the new No. 5 shaft at Creighton, is in charge.

NICKEL . . . AND ITS USES

#### Nickel and Christmas

.... and how the White Metal from Sudbury District brings the world "back home" at Yuletide

Nickel plays its part in the Christmas scene just as surely as though it were named for Saint Nick instead of "Old Nick," and of nickel's many gifts to humanity perhaps none is more significant at Christmas time than its help in bringing people together and in transporting gifts and messages.

Just as the journey of the Three Wise Men heralded the first Christmas so long ago, so today people in many lands journey homeward to celebrate this dearest of all holidays with their loved ones. And even before the Christmas season arrives the transportation facilities of the world are busy preparing for the day, since in modern civilization the materials for Christmas gifts are gathered from all corners of the globe. SWIFTER THAN SANTA

Nickel is an essential element in up-todate transportation and communication. The valuable attributes of the white metal which comes from the mines near Sudbury are used by the railroads, in automobiles and trucks, in ships and in aeroplanes to make travel faster, safer and more comfortable, and transportation speedier and more efficient. When people cannot join their families on Christmas, nickel again comes to their assistance in telephone, telegraph and radio equipment, so that with the help of nickel, electricity, swifter than Santa Claus' reindeers, can carry love and greetings around the earth in almost no time at all.

The famous stainless steel Zephyr trains have come to be a symbol of the progress the railroads are making in improving their service by reducing deadweight, and these trains are also an example of how nickel is contributing to railroad travel. Stainless steel of the kind used in the Zephyr trains contains eight per cent. of nickel, and that is one of the seasons why the Zephyrs can be built so much lighter than old types of trains. For stainless steel is both strong and resistant to corrosion. Throughout railroad equipment—in locomotive axles, cylinders, bollers, etc., in the trucks, and side frames, bolsters, coupler yokes, and in many other parts of passenger and freight cars, nickel alloyed steels and cast irons are doing important work. durability, efficiency and economy of cars have improved from year to year, nickel has been right there helping to make a large proportion of the improvements possible.

Nickel steels are used in the frames, gears, transmissions, engines and other automobile parts to insure the necessary strength and ruggedness under the severe strains they must encounter at high speeds. Nickel cast irons go into cylinders and cylinder blocks, and in the case of trucks it is said that nickel cast iron cylinders last more than twice as long as plain cast iron.

Interesting new uses of nickel in automobiles are in the thermostatic devices which control carburetor air temperature, heaters and the like. Some cars have as many as eight thermostats, and each thermostat contains a considerable amount of nickel. Overdrive units in several of the new models are made of nickel steel. The appearance of automobiles is also

The appearance of automobiles is also improved by nickel, for the bright trim is dependent upon nickel, in part, for its lustre and its lasting qualities. Chromium-plated surfaces, such as those on bumpers, radiators and headlamps, have a relatively thick nickel underplating beneath the chromium.

Finally nickel steels and cast irons are used in much of the equipment for manufacturing automobiles, trucks and trailers.<sup>\*</sup>

#### NICKEL AT SEA

At sea as on land the problem of reducing deadweight is becoming increasingly important, and here the corrosive action of salt water makes the problem even more difficult. Because of its remarkable resistance to this kind of corrosion, "Monel" is



"Monel" is used for various parts of shipboard power plants exposed to salt water, for turbines, shafting, propellers, pump parts, storage and de-aeration tanks in the boiler feed water system and elsewhere. It is also employed extensively for gallery equipment. An especially interesting use of "Monel" is for water tanks on lifeboats, where its corrosion resistance guarantees the water supply in times of emergency. Other copper-nickel alloys are used for condenser tubes, gasoline tanks and salt water flushing and fire lines on ships.

#### ALL VITAL PARTS

Nickel steels are employed for shafts, turbines and turbine blading, for bolts and studs on high pressure steam lines, for expansion joint fittings, and for many other purposes. Nickel cast irons are also finding numerous applications in the marine field. Nickel silver and stainless steels are extensively employed for hardware and decorative purposes on the ocean-going liners.

A new use of pure nickel in ship construction was developed this year, when three large fishing trawlers designed to bring fish to market in the freshest possible condition were launched. A feature of these boats was the nickel lining of the refrigerated fish holds. Nickel was chosen for sanitary reasons, and it is expected it will help to prevent contamination and spoilage of the fish.

#### UP IN THE AIR

Nickel has proved itself just as important in air transportation as on land and on sea. Take for example the famous Clipper 'planes, which are in trans-Pacific service. In their engines the crankshafts, connecting rods, cams, gears, shafts and other severely stressed parts are made of nickel alloy steel. "Inconel," because of its resistance to high temperatures and to corrosion, is employed for exhaust manifolds, cabin heaters and other parts handling hot gases. These Clipper ships illustrate the wide uses of nickel alloys in aviation.

Mickel alloys in aviation. Where strong, corrosion resistant nonmagnetic materials are needed in the air, both "Inconel" and "Monel" are extensively employed. "K Monel," the heat treatable type of "Monel," is being used more and more in instruments used for navigation, because its non-magnetic feature prevents it from causing errors in the instruments.

#### CARRYING MESSAGES

Nickel is just as important in communication as in transportation. It is used in circuit relays and other apparatus in telegraph equipment and in many telephone parts. The use of "Permalloy," a high nickel iron alloy, made it possible to multiply by 17 the number of messages submarine cables can carry. And nickel is an essential element in all radio tubes.

And so we see nickel at the service of civilization. At Christmas time it is easy to see how much such things mean to the world. Suppose the railroads, ships, trucks and aeroplanes could not help Santa Claus in shouldering his pack, and suppose all the thousands of people the world over who look to Christmas as a home-coming day could not find speedy and efficient transportation, Suppose they could not even wire or telephone a message of cheer. Well, Christmas would still be Christmas; but it is a satisfying thought, just the same, that the nickel which we send out from Sudbury makes such important contributions not only to Christmas but to mankind all through the year.

#### PROTECTS FLAVOR

The flavor of vanilla is so delicate that most metals are injurious to its taste and aroma. After a series of tests, one firm selected Inconel for storage tanks and other equipment handling the extract, because this alloy caused no harmful effects. For vanilla percolators, Monel Metal is often used.

#### **RESISTS FATIGUE**

In almost every case the strength and corrosion resistance which nickel contributes are important reasons for choosing the metal. But in many cases there are other reasons. For example nickel helps steel to resist the effects of fatigue—that is, a nickel alloyed steel will stand up much longer under repeated shocks and jolting than ordinary steels do. Therefore railroads in other countries are following the lead of Canada in adopting nickel steels for fatigue resistance. Another reason for choosing nickel steels was also pioneered in Canada. That is the fact that nickel alloyed steels do not become brittle in cold temperatures as easily as ordinary steels and hence are safer in wintertime.

Finally nickel alloys like "Monel" add to the comfort of railroad travel in dining car equipment, where "Monel" is often used not only for sinks and working surfaces but even for walls and ceilings of the kitchens.

#### IN AUTOMOBILES

The automobile industry was the leader in employing nickel's useful qualities to improve travel, and today that industry uses more nickel than any other. As the speed,



## Christmas in the Clouds

Christmas dinner in the clouds is literally what these chefs are planning in the ultra-smart kitchen high up in the Rockefeller Centre Restaurant in New York City. All working surfaces in the kitchen are of smooth, lustrous, non-tarnishing Monel Metal, made from Sudbury ores. Page 4

## Frood Athletes Have "Silver" Supply Cornered



Out at Frood they may spend a lot of their time digging for copper and nickel, but their real hobby, apparently, is collecting silver.

Stepping into Frood Athletic Association's trophy room on a bright day, without colored glasses, is just asking for eyestrain. The glare is pretty strong.

#### ALL BUT THREE

All but three of the major athletic trophies of Sudbury district, as well as a lot of others, have been gathered in by Frood this year. One of those three is the Swenson Cup, emblematic of the Nickel Belt Hockey League championship, but Manager Harry Towns modestly explained to Triangle that they decided to have this picture taken now instead of waiting until spring, because the Swenson Cup doesn't photograph very well.

All credit to the athletes who helped bring this imposing array of trophies to their association!

Prize of the collection, of course, is No. 1, the Donald MacAskill Charity Trophy, won by Refinery last year but lifted by the fast Frood club in the 1936 pre-season series after some thrilling tussles, and presented to them by Dr. R. B. Harris, president of Copper Cliff Canadian Legion, to whose worthwhile charity work go the proceeds of this annual series.

#### KOMONEN BOOTY

No. 2 is the Washington Star Marathon Trophy, one of the most handsome prizes from the booty bag of Dave Komonen, annexed the trophy when it was up for competition in the old Town League, consisting of Clerks, Smelter, Copper Cliff Town and Frood. When this league was absorbed by the Nicket Belt loop, Frood was entitled to keep the tankard.

#### THE MONEL CUP

No. 5 is the handsome silver Monel Baseball Cup, donated by the late Col. Ambrose Monel, of Tuxedo, N.Y., first president of the International Nickel Company of New Jersey, from April 1, 1902, to October 6, 1913, when he resigned for war service. During his presidency Monel Metal was developed. The trophy was presented in 1914 for annual competition. Copper Cliff later won it three times in a row, and was qualified to retain it, but in 1921 or 1922 re-donated it and it is still the most coveted of Nickel District baseball awards. Barney Barnett's Froodian nine captured it in 1936.

No. 6 is the Lorne Fowler City of Sudbury Softball Championship Trophy, won in 1935 and 1936 by Frood.

No. 7, donated in 1934 by Sudbury Branch of the Canadian Legion for the Nickel District tug-o-war championship, has been won by Frood in each of the annual contests since.

No. 8, the Royal Trading League softball trophy, has been won by Frood four years in succession and is now in their permanent possession.

No. 9 is the Sam Rothschild Lions Club Trophy for the baseball tournament held July 1, 1935, and won permanently by Frood. No. 10, the W. A. Evans Football Trophy,

No. 10, the W. A. Evans Football Trophy, was donated in 1910 and was won by Frood in 1935 and 1936. Copper, nickel and various kinds of wood growing in the Sudbury district, were used in making it.

Detroit Red Wings; The Allan Cup, won in 1936 by the Kimberley B.C. Dynamiters; The Memorial Cup, won in 1936 by the West Toronto Nationals. All but one of the players on these three victorious teams wore C.C.M. nickel-plated skates.

Here are some more records, just another example of how Canadian nickel travels far afield in countless forms. Take the Olympic Games, played at Garmische, Germany, February 6th to 16th, 1936. Teams representing the following countries were 100 per cent. users of C.C.M. nickel-plated skates; Austria, Canada, Czechoslovakia, France, Great Britain, Hungary, Letland, Poland,Sweden. Germany's figure was 80 per cent., Japan's 85 per cent., United States 50 per cent. Out of the above 12 teams, with a total of 164 players, 152 were C.C.M. equipped. CANADA AND U.S.

An analysis of the equipment of professional and amateur teams in Canada and the United States for 1935-36 and also on the 12 hockey teams playing in the Olympic Games, show that out of a total of 71 hockey teams checked in Canada and the United States (exclusive of the Olympic Games) comprising 842 players, 796 used C.C.M. nickel-plated skates. Out of 310 professional players, 286 played on C.C.M.'s. These comprise 23 teams in the National Hockey League, Canadian-American, 'Pacific Coast and North Western Leagues.

Just to complete the list, last season's Stanley Cup Winners, Detroit Red Wings, when checked, April 13th, 1936, showed that out of 15 players, 14 used the C.C.M. nickelplated skates. In the N.H.L. play-offs, Montreal Maroons and New York Americans were 100 per cent. C.C.M.'s, and all but one of the Toronto Maple Leafs. All players of the Montreal Canadiens, all but two of the New York Rangers, and all but three of the Boston Bruins used C.C.M. skates.

#### ON PRO. TEAMS

Professional teams in other leagues 100 per cent. equipped with these skates, were: Syracuse, Rochester, Philadelphia, Vancouver Lions, Seattle Sea-Hawks, Portland, Calgary, Edmonton. All but one man with Detroit, Olympics, Cleveland, Pittsburg Shamrocks; all but two of the Springfield Eagles, New Haven and Boston Clubs.

Out of 48 leading amateur teams, 29 teams were 100 per cent. C.C.M. equipped; seven teams, all but one man; five teams, all but two men.

A total summary of the above shows that, out of a total of 1,005 players, 948 used nickel-plated skates by C.C.M.

## SHIFTY SHIFT LEAGUES OPEN

With the Nickel Belt loop thoroughly under way, shift hockey is beginning to break out in its annual rash at the various INCO camps. The big league matches may draw the crowds and jam the newspaper columns, but for pure, undefiled, delirious hockey, give us one of those shift tussles.

#### ANYBODY'S RACE YET

In the Nickel Belt, at the time of writing, Frood has gone a bit soft after a whirlwind opening, but still has potentially one of the best hockey machines in Canada. Creighton, the Courage Club, is on the comeback trail after a flock of injuries and other setbacks that would have made less stout-hearted an outfit fold up like an old accordion. Refinery, probably the most under-rated club in the league, is right up near the top of the honor roll. Coniston is making a splendid showing for its first year, and can never be held lightly. Copper Cliff, unenvied cccupants of cellar position in the league standing, nevertheless are shaking off their lethargy and (lashing some real hockey. It's still anybody's Swenson Cup.

#### PRE-SEASON TILTS

Coniston shift hockey is underway, with Stevenson Shift, Shops, Geoffrey, McMullen and Day shifts all entering clu opening game, Day Shift administered a 3-1 deleat to Shops. Coniston is also playing pre-season inter-plant matches with Copper Cliff, where six teams are almost certain to line up for the Cochrane-Dunlop Cup, emblematic of the Shift League champion ship and won last season by the Orford Aces. The likely Copper Cliff shift teams are: Dubery, Wulff, Acheson, Bowman, Crusher and Orford. Bowman's concentrator crew have already handed a 4-2 trimming to the Crusher team, although the latter was master-minded by none less than Coach Closs. The Acheson outfit are again getting pointers from Jack Williams, who is ably assisted in the coaching assignment by Gordon "Call me Specs" Telford. Dubery's squad looked strong in their pre-season canter against an Ontario Refinery line-up, which they won 7-1. More exhibitions against smelter teams will likely be played by Refinery, which will probably have three shift clubs, as follows: Shops and Office; Tankhouse, and Yard and Casting. Last year's three-team Refinery League was won by the Shops and Office team.

## **"COONEY" HAS BEEN AROUND**

Meet "Cooney" Wood, coach of Ontario Refinery team and a former ace goalkeeper, who has played hockey in more countries than most farmers

have hay. He was born in Elora, Ont., in 1898, and even if the difference between that and 1936 does come out to 38 years, he doesn't feel half of them.

He was christened Cosford, but sighed with genuine boyish relief when the gang tacked "Cooney" on him, and it's stuck ever since.



"Cooney" Wood

#### ATHLETE-PROSPECTOR

When he came back from the war in 1918 he played hockey in the winter and baseball in the summer with Kitchener teams, and in the spring and fall he went prospecting in Northern Ontario. Then he hooked up with clubs at Kirkland Lake, Lightning River, and other mining centres. He was on the championship Halleybury baseball roster in 1925.

After a whirl in the brokerage business in Western Canada he got back into the hockey wars again at Saskatoon, thriving North Saskatchewan hub, playing goal for the Quakers.

In 1933 the Quakers were Western Canada Allan Cup finalists, and lost out to Moncton only after a thrilling series played in Vancouver. That fall the enterprising Saskatoon club got C.A.H.A. permission to represent Canada at the International Hockey games in Milan, Italy.

They left Saskatoon December 11, returned April 1. The two Silver boys, Cliff Lake, and Jim Dewey, all now on the INCO force, were with the club along with "Cooney." They played in Sudbury both coming and going to Milan, and were spotted by eager INCO managers.

On their big trip they played 51 games, lost two, drew one.

#### "WEINERWURSTED"

Moncton beat them en route, and Germany trimmed them 2-1 when they were the worse for an overdose of weinerwurst. At Milan, where 15 nations were represented, they played United States in the finals and only one shot slipped past "Cooney" in the nets, Canada winning \$1.

Countries in which they took part in exhibitions included Switzerland, France, Belgium, Norway, Sweden, Germany, Czechoslovakia, Hungary, Austria and Italy. Everywhere they were royally treated. "Cooney" is married, has one young son.

"Cooney" is married, has one young son. He came to Refinery as coach in November of 1934, thinks this season's windup of the Nickel Belt loop will produce the fastest hockey in the history of this district.

He doesn't actually promise that Refinery will be in at the kill, but you can see he has h's mind working along that line.

#### **20 NEW TRAINS**

In France 20 new two-car streamlined trains are being built, like the "Zephyr." Reduced weight and attractive appearance are being secured by use of "shot-weided" chromium-nickel steel.



Frood's crack long-distance runner. It was won in 1935, the same year that Komonen's name flashed across the sport headlines of the continent for his victory in the famous Boston Marathon. No. 3 is the Copper Cliff Athletic Asso-

No. 3 is the Copper Cliff Athletic Association's Shield for the tug-o-war competition it stages annually at its 24th of May celebration, and which was won at the 1936 pull by Martin Horne's Frood huskies. No. 4 is the James W. Beard Cup, do-

No. 4 is the James W. Beard Cup, donated in 1913 by the man whose name it bears, a New York auditor who was keenly interested in Nickel Belt sports and in baseball in particular. A shareholder in the New York Giants, Mr. Beard was a great admirer of the late John McGraw. Frood

#### DONATED BY MCCREA

No. 11 is the McCrea Football Cup, donated in 1928 by Hon. Chas. McCrea, former Minister of Mines for Ontario. Frood won it in 1935, 1936.

No. 12 is the Sudbury Lions Club tug-owar trophy, won by Frood on July 1, 1936.

The other two smaller cups at the bottom were used to round out the balance of the display, and are private awards picked off by Harry Towns in beauty contests during his younger days.

## NICKEL GIRDLES GLOBE AS HOCKEY GAINS IN POPULARITY

Skating around the world on Sudbury nickel isn't as crazy an idea as it may sound. C.C.M. nickel-plated skates of the finest steel are now sold in every country of the world where skating is enjoyed or hockey is played.

Nickel is a familiar partner of industry at the Canada Cycle and Motor Company plant in Weston, Ontario, and all C.C.M. skates—back of many a hockey victory and skating championship—are nickel-plated. In fact, so popular has this feature become that C.C.M. nickel plating is known in many coun-

tries of the world as "20-Year Nickel." C.C.M. "Matched Sets," (skates and shoes), the last word in skating equipment, are advertised, everywhere, with finishes such as "C.C.M. 20-YEAR Velvet Nickel," "C.C.M. 20-Year Nickel Plating," and so on.

#### ONLY ONE MAVERICK

"Champions Everywhere" is not an empty phrase, when applied to C.C.M. nickel-plated skates. At home, for example, consider the three great annual events in the hockey world—The Stanley Cup, won in 1936 by the

#### AT THE MINES

Toplanders, Rockhouse, and No. 5 Shaft will probably supply the shift league excitement at Creighton this winter, while at Frood there have as yet been no plans made for a loop, other than inter-level challenges whenever the spirit moves the boys.

Keep your eye on the shifty shiftleaguers; they may not be Allan Cup material, but they're heroes in their own back yards.

## Happy Harvey

After riding along in a slump all last year, Harvey Jackson, of Toronto Maple Leafs, hit his old stride against Montreal Maroons December 9 when he rattled in two characteristic goals. And, judging by the look on his face, that's the way he intends to perform all this season. Maybe he's got nickel in his skates too, like 90 per cent. of the world's best hockey players.

## **Refinery's Electrolytic Tanks,** Where Commercial Copper Emerges



Tankhouse at the Ontario Refining Co., Ltd., where in a silence which contrasts sharply with the din of rock drills, rumbling of rod mills, and hiss of converter air in other departments of INCO, a quiet chemical process accomplishes the purifying of blister copper. The tankhouse covers almost four acres, contains 1,230 of those concrete lead-lined tanks. The special cranes which place 38 550-lb, anodes in the tank at one time invariably excite special interest among visitors. Triangle's photo shows a crane about to deposit a load of anodes in one of the electrolytic tanks.

As described in the last issue of Triangle, 4 the production of anodes is the first stage in the copper refining process. These flat copper anodes, measuring 36 inches square by  $1_4^i$  inches thick, weigh approximately 550 pounds each and contain small quantities of gold, silver, platinum metals, nickel, selenium and tellurium. The next step in the process is the separation of these impurities from the copper. This is accom-plished in the Electrolytic Tank House.

#### 1,230 CONCRETE TANKS

This building, a partial view of which is shown, covers an area of almost four acres and contains 1,230 concrete lead-lined tanks. The regular tanks are laid out in 32 sec-tions of 38 tanks per section. Twelve are used to remove some of the copper from the solution which has a tendency to increase in copper content, and two tanks are for experimentation. Each tank is 11 feet 3 inches long, 3 feet 6 inches wide and 3 feet  $9\frac{1}{2}$  inches deep on the inside. Concrete signs unpart the topke and all are your

piers support the tanks and all are very carefully insulated by 2-inch tile slabs to prevent current leakage. In the application of the electrolytic method of producing pure copper as prac-tised at the Ontario Refining Company and elsewhere the comparticult impure apodes elsewhere, the comparatively impure anodes are suspended in the tanks alternating with thin "starting" sheets of pure copper which are the basis of the cathodes. The tanks are filled with a copper sulphate solution, a combination of copper and sulphuric acid, together with an excess of sulphuric acid to increase the electrical conductivity. D.rect-current electricity passes into the anodes through the solution and out at the cathodes.

#### COPPER DEPOSITED

By electro-chemical action the copper in the anodes is dissolved and deposited on the cathodes, while the impurities present in the anode either fall to the bottom of the tanks as slime or if soluble are dissolved in the solution.

The thin, pure sheets of copper mentioned in the last paragraph are made on blanks called "starting blanks," which are hard rolled copper sheets. These sheets are placed in two special sections of tanks, together with extra heavy anodes, and after 24 hours they are removed and the thin deposit of copper on each side is "stripped." These "starting sheets" have copper loops 4 inches wide attached by a special punch machine and after being carefully straightened are ready to take their places in the regular When suspended in the tanks, these sheets weigh approximately 10 pounds, and after 14 days they are built up to weigh 230 pounds, of the purest form of commercial copper available, having a copper con-tent consistently 99.985 per cent. and better. In this form they are referred to as "cathodes."

soluble in the solution or "electrolyte" as it is called. It naturally has a tendency to build up in this solution of which 1,196,800 gallons are constantly in circulation and its control, subsequent removal, and the pro-duction of marketable nickel residue is an important feature of the operation.

The other impurities are insoluble and fall to the bottom of the tank as a slime. This slime, in addition to copper and nickel, contains the gold and silver, the platinum metals, the selenium, and the tellurium, and is the feed to the Silver Refinery. Silver, gold and platinum metals are recovered in this department and the by-products, rich in selenium and tellurium, are treated in the Selenium and Tellurium Plants for the recovery of these metals.

#### TAKES 14 DAYS

TAKES 14 DAYS The pure copper cathodes are removed from the tanks at the end of 14 days and new "starting sheets" put in their place. Immediately after pulling from the tanks the cathodes are washed very carefully with hot water at 120 pounds pressure to remove all traces of adhering solution. This is an important step in maintaining the high purity of O.R.C. copper and receives careful attention. Automatic transfer from careful attention. Automatic transfer from the crane rack to narrow gauge cars is effected by an ingenious mechanical loader following which the cars are weighed and spotted on storage tracks for shearing or furnacing.

Each anode produces two sets of cathodes and at the end of 28 days about 13 per cent. of the original anode weight remains. It is then removed as "anode scrap" and recharged into the anode furnaces together with blister copper, subsequently to be cast into new anodes.

#### HAS TO BE CAST

As noted above, the cathode copper is of extremely high chemical purity. However, its physical form renders it unsuitable for the many and varied fabricating processes which it must undergo before it finally appears as wire, cable, sheet, strip, tube or some other form. This then necessitates the remelting of the greater part of the cathodes produced and subsequent casting into the numerous different shapes required by the mills. The Shapes Casting Department is a very important division of the organiza-tion and will be dealt with in the next issue.

## **RETIRE ON INCO PENSION**

(Continued from Page 1)

matte was shipped, while a new smelter was being built at Copper Cliff.

TAPPED FIRST MATTE

In July of 1904 the first blast furnace in the new Copper Cliff plant was started, and "Jud" Webb tapped the first matte from it. He worked on the tapping floor, then trans-ferred to the charging floor to become head feeder. Later he became smelter shift boss but in 1911 he retired temporarily from INCO service, taking up smelter work at Trail, B.C. He returned in 1915, and since

then has been foreman on the ore bins. Fully as important as any of the operating improvements which have been put into effect in the intervening years is, in his opinion, the extensive work now carried on by the safety department in removing hazards and persuading men to work carefully. He himself has made many suggestions for safety improvements, and they have all been promptly acted upon. When he punches out on December 31

he will feel satisfied that he has done his duty, he says, and he will also feel very grateful to the Company for his pension and the security it guarantees him after his long and faithful service.

#### A REAL SCOT

At Blairgowrie, Perthshire, Scotland, where his father was a flax dresser, James Crossgrove was born on December 14, 1871. When he was eight the family moved to Dundee. As a young man he followed the sea, was a stoker

in merchant ves-

sels, most of which plied the Mediterranean

route. Sometimes

even now he longs

for the life on the

ocean wave, and

is keenly antici-

pating that sea

He was mar-

ried on July 6,

1893, the same day

as King George

land."



## **38 YEARS OF SERVICE**

To have acquired the universal respect and liking of his fellow employees over a period of more than 38 years is no mean accomplishment. It may be safely said that W. A. Hicks, Sr., has the goodwill of all those who know him.

He was born in Cornwall, England, and at five years moved with his parents to the Iron Mining district of upper Michigan. He is probably the only employee still at work with the company to begin with the operations in Cleveland, O.

#### STARTED IN 1898

In 1898, under the guidance of the late D. H. Browne, metallurgist, the Canadian Copper Company with about 25 men were conducting experi-

mental refining and laboratory work at Cleve-land, and Bill Hicks was employed in August as a chemist and in research refining work. At that time the mining operations were being carried on at Copper Cliff under the Cana-dian Copper Com-pany and the refining operations at Bayonne by the Orford Copper



W. A. Hicks, Sr.

Company. Experiments were being con-ducted at Cleveland to refine the copper and nickel electrolytically instead of by the Orford process as at Bayonne. In 1902 the International Nickel Company

was formed and took over both the Orford Copper Company and the Canadian Copper Company. The work at Cleveland was abandoned and D. H. Browne went to Copper Cliff as metallurgist, while W. A. Hicks was transferred to Bayonne as Assistant Chief Chemist to Thos. Fudge.

#### **TO CLIFF IN 1903**

His stay at Bayonne at this time was short, for in January, 1903, he was trans-ferred to Copper Cliff to be assistant to J. W. Rawlins, who at that time was chief chemist. These were the good old days at Copper Cliff before electric lights, with roast yards to the east of you and roast yards to the south of you and roast yards to the north of you. No matter which way the wind blew it was good for a strong dose

of sulphur smoke. Creighton Mine was becoming the big producer, and the high copper ore of the Copper Cliff mine was being replaced by the high nickel ore of Creighton Mine. Of the employees in the laboratory at No. 2 mine site, one chemist, Ed. McKerrow, is still in the laboratory at Copper Cliff.

#### MANY CHANGES

Mr. Hicks' stay at Copper Cliff was not for long, and in 1904 he was again trans-ferred to Bayonne. As Mr. Fudge was carry-ing on the work of Metallurgist as well as chief chemist, the burden of supervising the laboratory fell on Mr. Hicks as Assistant Chief Chemist. He carried on there for 14 years. During this period many changes were introduced in the process. At first there were six or seven treatments in the cupolas to separate the copper from the nickel, later reduced to two. Horse drawn pots were used in the separation process. No overhead cranes were there to pick up the pots. Calciner furnaces were all hand operated, and the oxide was drawn off into wheelbarrows. These were the good old back-busting days.

With the opening up of the Canad.an Re-finery at Port Colborne in 1918, he was sent to take charge of the laboratory there, which position he has held since. At Port Col-borne he has seen the change from handoperated calciner furnaces to partly mech-anically operated, and now fully mechanical furnaces. The Orford separation process was improved by the use of water-jacketted cupolas and the Copper Converter Depart-ment by the introduction of basic converters.

#### 38 AT A TIME

The anodes are placed in the tanks in units of 38 by means of special stiff-legged cranes and the speed and economy effected by these cranes are a distinct feature of the Tank House operations.

The multiple system of electrical connections is used with a current of 10,800 amperes at .2 volts per tank. The solution is heated by means of low pressure steam to a temperature of 150 degrees F. and circulated through the tanks at a rate of 2<sup>3</sup>4 gallons per minute. This is carefully checked every day and maintained as constant as possible for the sake of uniform quality and efficient operation. In order to produce a tough, smooth deposit of copper on the cathodes, glue, oil and bindarine are added to the solution in small amounts. Daily samples of the deposit are examined to determine the correct quantities of these "addition agents."

#### SOME NICKEL TOO

Of the major impurities present in the original anode, nickel alone is partially

## **29.6 ACRES IN ROOF AREA**

(Continued from Page 1)

and 90 miles long. Cement, 200,000 sacks, which, if laid end to end, would reach 57 miles.

Brick, tile, and fireclay and magnesite brick, 3,000,000.

Structural steel, 18,900,000 pounds. Glass, 28,500 square feet. CARLOAD FIGURES

Or, translating all the materials shipped in for the extension program into railway carload lots, our juggler of big figures reveals that there were:

Two hundred and two cars of cement; 47 cars of railway equipment; 93 cars of lumber; 184 cars of machinery; 40 cars of fuel; 36 cars of reinforcing steel; 263 cars of brick, tile, glass, etc.; 176 cars of fire-brick and magnesite brick; 93 cars of gravel; 50 cars of piping; 392 cars of structural steel; 106 cars of material for the stack;

18 cars of miscellaneous supplies. Which makes a total of 1,700 railway cars, or approximately 55 of the averagesized trains coming into Sudbury from Toronto.

James Crossgrove

and Queen Mary were wed. In 1907 friends in Copper Cliff persuaded him to join them. He went to work for the Canadian Copper Co., his first job being watchman at 13 cents an hour. Soon his stoker experience stood him in good stead, and he began firing for Wm. Mayhew in the old steam plant. The next year he had three months' leave to return to Scotland, where his mother had passed away and his brother was seriously ill. When he returned, he started in the smelter as a craneman, later moved to the charging floor, and eventually covered all departments. In 1913 he was transferred to the sub-station, but in 1916 he left for the war with the No. 1 Construction,

#### FIRST ENGINEER

Returning once more to Copper Cliff in 1919, he became first engineer at the substation, and that's been his job since. He has enjoyed his work, and feels a bit sorry at leaving it, but admits that some days of leisure will be a welcome change.

He has three sons and one daughter. All three boys had their first jobs with INCO, and one of them is still on the force.

voyage when he goes "Rollin' home This whole department was transferred from to Bonnie Scot-Port Colborne to Copper Cliff in 1931-32.

#### QUICK ASSAYS

It is a history of smelting and refining achievement that he can look back on, in which he has played his part faithfully. During this time he has worked in 15 different laboratories. In the early days at Copper Cliff it was the laboratory practice to report assays once a week. The furnace testing methods were quite primitive. When Jimmy McArthur made his daily rounds of the smelter he would look at the furnace slag and shout "Give her another barrow of margins, boys!" gins, boys!" At the present time assays are reported to department superintendents several times daily and every operation is under close chemical control.

Mr. Hicks is past master of the Blue Lodge Masonic order and Past Principal of Royal Arch Chapter, and a member of the Knights of Pythias. He plays a good game of golf and a few years back enjoyed his tennis.

A son, W. A. Hicks, Jr., works for the INCO in the time office. A daughter, Charlotte, is married and lives in Niagara Falls. N.Y. A son, Kenneth, is attending school. It is probably the smooth and efficient housekeeping methods of Mrs. Hicks which keep her Wm. looking so fit.

Best wishes from all employees go out to Bill Hicks for many more years of useful service.

#### Within the INCO TRIANGLE

December, 1936

# **Co-Operation Slashes Accident Rate**

SAFETY ENGINEERS **CHECK 1936 RESULTS** 

## General

#### (By G. S. JARRETT)

we are talking of accident While frequency and thinking in terms of accidents per thousand shifts, tons of ore hoisted per

injury, or shifts worked without lost time, let us not forget either the humanitarian aspect or the cold hard cash. A re-duction in accident cost is naturally looked on very favorably by an industrial organization. Actually, however, those who gain most by this reduction are those of us who are actually subject to the hazards. For

Page 6



G. S. Jarrett

every dollar a man receives in compensation, he would normally receive \$1.50 in his pay envelope. Thus, when we look at a decreased cost of accidents we think of it as an increase in the average pay envelope of the employee.

Continuing further in the same vein, let us think for a moment of those who are unfortunate enough to suffer permanent disability. In many cases the disability results in a handicap that materially affects the employee's ability as a wage earner for the rest of his life. The financial loss through this cannot be calculated. Therethe saving through a reduction in accident frequencies occasioned by mini-mizing permanent disabilities and suffering is beyond estimation.

#### CREDIT DESERVED

Other columns of this issue review in detail the highlights of the safety campaigns at the various plants for the current year. Invariably the value of the co-operation of the superintendents, foremen and men is rightfully held in high esteem. It only remains for me to add my congratulations to each and every one of the plant safety engineers for their valuable part in the work that has been accomplished.

Without consuming valuable space with a series of complicated figures, I need only refer to Triangle's feature, "How Are We Doing?" to bring vividly to your attention the marked achievement by way of reduction in accident frequencies in the Mining and Smelting division of the International Nickel Co., throughout the current year.

## Frood

#### (By W. E. BAWDEN)

As the year draws to a close the records show the lowest accident rate of any year since the mine opened. This is particularly pleasing considering that it has been a year of expansion, which means the appointment of new bosses, the training of miners to different jobs,

operation with the operating department, began the writing of certain standard regulations for motor haulage and stope work. This was further enlarged on by G. W. Mitchell, his successor, who also in co-operation with the operating department compiled a standard practice for each underground job. Each year brings added experience and during 1936 the Standard Practice Book was revised in conjunction with the Safety Department at Creighton so that it embodies the experience gained at each property. This revision was under the guidance of G. S. Jarrett, General Safety Engineer. All possible is done to make the book more than a set of safety rules. The information contained in this book aids the new boss and the new man and hands on to them the experience that others have gained over a period of time. Strict observance of standard practice in working is one of our main safeguards in safety period of time. To make sure that the men have been over the standard practices regarding their work, meetings are held in which the foremen go over the practices and discuss them with the men. At these meetings our accidents and accident rates are also discussed.

#### WORK DEFINED

The need for definite procedure in all work in a large mine is of course great. Approximately three tons of explosives are distributed throughout the working places each day. Each move in the handling of explosives is clearly defined from the time the explosives arrive at the property till the blasting takes place. We have had one serious blasting accident this year.

Approximately 140,000 feet of timber go into the working places in the mine each day. The handling of this timber into the working places is practically all done on the 12-8 shift. Not one lost-time injury has occurred on this shift during the year. shows exceptionally careful work. This Underground Superintendent Horne, Fore-man Milks and Shift Bosses McAllister, McKerrow, Dockrell, and Pollack have been in charge of this work.

FROOD RECORDS

Some new records in safety work have been established in the last year by the Operating Department. The best records for periods of work without a lost-time in-jury for the year, in addition to some established in previous years, are as follows:

1. In the summer of 1934 the Total Plant at Frood went six weeks or 47.432 shifts

without a lost-time injury. 2. In April, 1936, the Construction and Shaft Sinking and Maintenance Division had accumulated 27,307 shifts without a losttime injury. 3. The 2400 Level in April, 1934, accumu-

lated 26,296 shifts without a lost-time injury. 4. Shift Boss Casey Jones' shift on



October 11, 1936, had accumulated 27,058 shifts without a lost-time injury. This is an all-time record for a production shift.

5. Shift Boss H. Cherry on Construction work at the end of November, 1936, had accumulated 31,203 shifts without a lost-time injury.

6. At the end of November Shift Boss McAllister had accumulated 26,906 shifts without a lost-time injury.

Other shift bosses whose divisions have accumulated more than 20,000 shifts without a lost-time injury are: W. Armstrong, G. Deschenes and J. Ressel. M. Lahti on shaft work and construction work with his shift very nearly passed the three-year mark without a lost-time injury.

Anyone who has been a shift boss at a mine or who has studied accident records realizes what an achievement it is for a group of miners to accumulate 20,000 working shifts without a lost-time injury. CARE ESSENTIAL

Careful work and vigilance are, of course, the main factors in avoiding injury. An accident is caused by the failure of some mechanical device or structure, an oversight, or an inadvertent or careless move on someone's part. Hence the main part of safety work is the keeping of the idea of careful planning of work by the bosses and the careful carrying out of work by the men.

That safety work at Frood has achieved good results is due to the backing of the superintendent and his assistants, who have stipulated that safety is the first con-sideration in all work. With this in view and with the co-operation of all employees a record has been made that Frood Mine

employees may be proud of. We are planning and hoping for a still better year in 1937.

## Creighton

(By S. R. FREDEEN)

"Luck" is given the blame or credit, as the case may be, for many things, but when it comes to accidents, this factor of "luck" is consistently

overworked. An-other year is drawing to a close, a year which has clearly shown us that accidents do not just happen, but can be prevented. The accident record at Creighton Mine is a concrete indication of what has been and can be accomplished by every man from superintendent to

mucker heading



S. R. Fredeen

towards one goal, and that is, to work safely in a safe working place.

#### **BIG IMPROVEMENT**

A comparison of 1935 and 1936 records shows that during 1935 one lost-time acci-dent occurred in the total plant (ail surface and underground work) for approximately every 29,000 tons of ore and rock hoisted, while in 1936 one such accident occurred for every 47,000 tons. On a basis of shifts worked, we find that in 1935 one lost-time accident occurred for every 5,555 shifts worked compared to one for every 8.333 shifts in 1936. In other words, a 33 1/3 per cent. decrease in accident frequency. Improvements in the three divisions underground were as follows:

Shifts per l accide	worked ost-time ent. 1936	Shifts worked per lost-time accident, 1935	<pre>0% decrease in accident frequency</pre>
e. 3 Shaft	7.143	4.348	390%
o, 4 Shaft	6,666	5,000	256
o. 5 Shaft	4,166	2.777	33 1.30
otal			~~ ~ ~ 76
nderground	6.250	3.846	38 5 %

#### CREIGHTON RECORDS

During the 37-day period between June 19th and July 26th, no lost-time accidents occurred underground in the plant for a total of 21,736 shifts. Foreman Browne and his men in the No. 3 Shaft territory established a divisional record for shifts without a lost-time accident covering a period of 178 days between February 25th and August 22nd, or a total of 39,886 shifts.

Three shift bosses have set up enviable records during the year, not having had any accidents in their territories resulting in lost time. Shift Boss Villeneuve and his shaft inspectors began their record run on July 17, 1934, with a total of 11,100 shifts since that date without a disabling injury. Shift Boss Blackwell with 15,198 shifts since July 25, 1935, and Shift Boss Saari with 13,818 shifts since October 16, 1935, have also set up high marks. Shift Boss McIvor and his men were on the road to a new record this year when it was marred in November, having reached a total of 12,132 shifts. McIvor's men established a record of 13.604 shifts in 1935

#### 1937 OBJECTIVE

The common causes of mucking accidents, "rock rolling down muckpile" and "handling rock," showed a marked decrease during the present year with two, as compared with eight during the previous year. "Load-ing from chutes" accidents with four, and eye injuries" with two, as compared with eleven and six, respectively, during 1935, which were two other causes of accidents lost a great deal of their sting in 1936. But what makes this "slashing"

But what makes this "slashing' accident rates possible? Only the of



TRIANGLE'S INDEX OF ACCIDENT FREQUENCY

PER 1000 SHIFTS WORKED



W. E. Bawden

perienced in mining work. Naturally, the possibili-ties for accidents are greater with inexperienced men at work. These factors add to the difficulties in safety and production, but they have been overcome. The lowest yearly accident record previously established was in 1934, when

and the hiring of many men inex-

practically all the men employed were experienced Frood miners.

To establish and maintain low accident rates requires a high degree of co-operation between every employee on the job. That there has been much of this co-operation during the past year is shown by the comparatively low accident rate. The 12-8 shift at Frood, which comprises some 200 men, has gone through the year till the time of writing with only one injury in-curring time off work to the injured party.

#### STANDARD METHODS

The highlight of our accident prevention at Frood, as well as other departments of INCO, has been the standardization of methods of performing each job such as mucking, drilling, timbering, tramming and on through each classification of work. In the first year of production at Frood, A. E. O'Brien, then Safety Engineer, in coOnce again here's your check-up on how the entire INCO Mining and Smelting Division's record compares for the various months of 1936 and with the averages for other years. October and November figures have come in since our last issue, October down to .085 accidents per 1,000 shifts worked, and November with 1.35 accidents per 1,000 shifts worked, or considerable of an increase. The average for 1936 to date, however, is 1.06 accidents per 1,000 shifts worked, which represents an outstanding improvement over averages for all other years recorded. Watch Triangle's Index to Accident Frequency, and do your bit to keep those black lines down!

cooperation of every man in the plant in substituting "care and common sense" for "Lady Luck." And this is not a "week on and week off" job, but one which requires full time attention every minute of every Congratulations are certainly due the day. men at Creighton for the fine record of

(Continued on Page 7)

## \$75 in Prizes For Best Essays

Anyone interested in accident prevention and the protection of workers in the mineral industry of Canada is invited to send in a manuscript (not to exceed 2,000 words) not later than February 15. 1937, to the Secretary, Canadian Institute of Mining and Metallurgy, 923 Drummond Building, Montreal.

Prizes for the best manuscripts will be awarded: \$50.00, by Mine Safety Appliances Co.; \$25.00, by Drummond McCall and Co., Ltd.

Anyone from manager to mucker is eligible to compete. Papers of a practical and useful nature are desired, and credit will be given more for practical facts, figures, and suggestions than for the manner in which the paper is written. Description of accident prevention by the use of approved safety devices will be acceptable.

## SAFETY ENGINEERS **CHECK 1936 RESULTS**

(Continued from Page 6) 1956, but another year is ahead. Instead of one lost-time accident for every 8,333 shifts worked, let's see a year of one in 10,000 for 1937.

## Copper Cliff and Coniston

#### (By R. C. M. PELLETIER)

We in the Copper Cliff and Coniston plants may often wonder if all this talk of safety-the posters; the safety clocks; the



safety meetings; the installation of guards, railings and screens; the

R. C. M. Pelletier

wearing of safety shoes, goggles and spats; and the continual cleanup program—is of any value and if it has helped to reduce the number of accidents or to prevent injuries. To prove con-

clusively that accidents are becoming less fre-

quent and that safety does pay, we present the following table, compiled from the records of the two plants since 1930, the first complete year following the amalgamation of Mond and



#### TABLE PROVES IT

This table simply means that for every 100,000 shifts worked by men in Copper Cliff and Coniston plants in 1930, 25 men were injured badly enough to cause them to lose more than six days' work. Six years later, with a vigorous safety campaign, we find that for every 100 000 shifts worked, only six men were injured to that degree. In other words, the accident frequency has been reduced to one-quarter of the 1930 rate.

Does safety pay?

A record such as this is not easily reached. It has been made possible only by the continued efforts of all foremen to make their respective departments safer places in which to work, and by the manner in which all employees have responded to these efforts.

#### ALL SHARE CREDIT

This decrease in accidents cannot be credited to the efforts of any one particular shift. All departments have contributed to make 1936 our best year.

In the reverberatory department, Smith's shift established a new record by working 41,689 shifts without an accident. Somers' shift in the same building has had only one minor lost-time accident from January to November, 1936.

Wulff and his men in the converter building made a new record for that depart-

ment of 31,753 safe shifts. In the Orford building the shift that

program. In reviewing the accidents that you have seen or heard of this year, think how many could have been prevented by the exercise of more forethought and greater care. This is the type of accident that we can eliminate. So then, let each and every one of us enter the coming year with safety as the foremost thought. It is in this way, and in this way only, that we may check the numerous injuries caused by lack of caution. Remember, it is not a difficult thing to be careful, but it is a difficult thing

to get along with a permanent injury. The hearty salutation, "Happy New Year!" usually implies that we should forget our mistakes and misfortunes, and start the new year with the proverbial clean sheet. But in forgetting our past mistakes, let us not overlook the valuable lessons learned from them. These can always be used to great advantage, and if always remembered will lead to what we all hope for-a year with a minimum of worry and grief, and a maximum of health and happiness.

## ORCO

(By CARL WILSON) One of the prime essentials in accident prevention is a clean and orderly plant. The most numerous of all accidents are those caused by slips, falls, and falling objects. If rubbish is al-

lowed to accumulate, floors and passages not kept clean, or stair-ways and ladders not kept in good condition, accidents are invited. Every effort is made at the Refinery to keep each department clean and orderly at all times. A close check is kept on piling of copper bars, cakes, sheets, furnace

Carl Wilson

bricks and stores, etc., to prevent accidents from falling objects. Ladders, built to safety specifications, are inspected regularly and Safety Rules covering them are observed by all departments. THE NEW MAN

It is impressed on each employee that he must work safely both for his own sake and for that of the company. The Safety Rules are read and explained to him and he is equipped with whatever safety equipment is required in his department. This equipment must be kept in good order and if it becomes worn out or broken it will be replaced by the company. Before he starts a job the foreman shows him how to do his work and why it is done in that way. A check is kept on the new workman until the proper work habits are formed in a safe manner.

#### PROPER EQUIPMENT

A big item in the prevention of accidents is the proper safety equipment and clothing and that used in this plant is of the most modern type. In the Tank House and other buildings connected with the electrolytic refining of copper, the following equipment is used: Rubber shoes, rubber gloves, goggles, and, in some particular cases, rubber suits and hoods. Goggles with plain or colored shatterproof glass, asbestos suits, leggings and aprons, and miners' hard hats are worn on various operations, chiefly in the furnace and casting aisles. Respirators of different types are supplied according to the various conditions encountered and steel or aluminum toe guards are used in sampling and general handling of copper shapes where there is any possibility of toe injury. All belts, pulleys, fans, machines, etc., are pro-tected by guards to the fullest possible extent.

POSTERS AND SIGNS Safety signs are placed in the various departments as a constant warning to the workmen, to keep from under crane loads, off narrow gauge railways, and the necessity of wearing safety clothing and equipment Colored safety posters are placed on depart-ment bulletin boards and in other conspicuous places about the plant and changed about from time to time.

tor, the judge is able to render a just verdict quarter. ACCIDENT RECORDS

The various departments of the Refinery, with one exception, have bettered their 1935 record this year. There has not been a lost time accident for nearly 12 weeks. The Coal Plant has only had one lost time accident in six years and the Tank House, employing 150 men, has not had a lost time accident for two years. The complete department record of days worked without lost time accident as of November 30th, 1936, is as follows:

Acid Plant	1,261
Casting Dept.	1 2 01
Coal Flamt	1,001
Laboratory	-2,102
Power House	1,017
Shops	82
Silver Bldg.	103
Stores	2,102
Tank House	727
Yard and Transportation	157
Selenium Plant	678
Research	229
Tellurium Plant	858

#### SAFETY INSPECTION

Periodic inspections of each department are made by the plant Safety Inspector covering equipment, safety clothing, safety habits, sanitation, fire equipment, fire hazards, and accident hazards in general. A report covering the inspection is turned in the various department superintendents which is followed by a check-up later.

## Port Colborne

#### (By W. J. FREEMAN)

Port Colborne Safety Committee has set up a good record for 1936, up to the end of November, at the time this article is being written. In over 300,000 shifts worked, there have been less than 1,000 shifts lost on sevenday accidents, or less than 3/10 per cent. lost time.

To handle hot anodes and sharp edged electrolytic sheets requires care, if accidents are to be avoided, as well as the

many other operations in the process which, with carelessness on the part of the employees. may easily result in an accident.

A committee of ten men are con-tinually on the lookout to make the equipment in the plant as safe as it is possible to

man knows how to do his work safely. This committee is composed of W. J. Freeman, chairman; C. R. Howard, secretary; Frank Chalmers, first aid and statistician; F. D. Gallinger, J. A. Charland, C. G. Branigan, F. H. Lowe, R. C. McQuire, H. P. Roe and Ed. Noyes.

Meetings are held every six weeks, and accidents reviewed. An inspection committee of three is appointed at each meeting for the following six weeks. It is the duty of this committee to make joint inspection of the plant from time to time, and to make a written report of recommendations for safety measures. Unless the changes recommended involve the expenditure of a considerable sum, they are acted upon as soon as ap-proved by the committee. Changes involving a major expenditure are referred to the General Superintendent for his approval. TAKE TRAINING

There are 49 employees who have taken the St. John Ambulance training courses in First Aid. Twenty-three of these men have taken the third year course and received their medallions. Local doctors have given the lectures and conducted the examinations. Frank Chalmers has ably assisted with instruction in practical First Aid work.

The classes include the following emoyees:

## tor, the judge is able to render a just verdict placing the responsibility in the right HE'D LIKE TO START AGAIN

Page 7

two charges to

the converter are

alike. You can't

lean on yester-day's record. Yessir, I've enjoy-

ed smelting." Born in Fred-

ericton, N.B., on June 18 of 1879, Fred Stevenson landed at the

Mond Nickel Co.'s

Victoria Mine in 1900 looking for a job, and landed

"I've enjoyed smelting," says Fred Stevenson, of Coniston. "I just wish I were 30 years younger and starting all over again. It's a great game, and no day is the same. Your ores vary hourly, and no



**Fred** Stevenson

one helping to build the smelter. He was with the mechanical department until the smelter was blown in, and then he went to work under Bob Richardson,

A young fellow needed a strong back and plenty of pep in those days. He worked seven days a week, 12 hours a day, for 16 cents an hour, and on changes of shift he went through 24 and sometimes 48 hours without a break. In between those hours he found time to hunt and fish, chop wood, swap yarns, and go canoeing in the moon-light. He was liable to be a tapper or a mechanic one minute, and a bricklayer or a skimmer the next. If he were punching he looked after two shells, did his own cleaning up, and handled odd jobs on the side. It's a bit different now.

Fred Stevenson, whose continuous service dates from Nov. 24, 1909, went through the arduous training from start to finish, graduated as smelter foreman, holds that position today at Coniston with INCO. He was married in 1903 at Beachburg, Ont., has two daughters

He's a great believer in safety work, says that the average man in his own quiet way takes a good deal of pride in the safety record of his shift and hates to see it broken,

He prizes highly the lasting friendships he has made with young fellows who got their training in the Coniston smelter and have gone out into the world. He gets letters from one lad in South Africa, from another in Mexico.

#### DICK GARR PASSES

Another friendship of which he was proud was broken by death two months ago when Dick Garr passed away at Chula, Missouri. First general foreman at Victoria smelter, Garr invented the "gun" which is used to force sand onto the surface of the molten charge in the converters. The best tale about Fred Stevenson's

hunting experiences is one he neglected to mention to Triangle himself, but it was passed on by a thoughtful friend. It was in the early days, and Mrs. Stevenson, impressed by his tales of hunting prowess, was anxious to see her husband shoot a deer. They went out several times with no luck. One day Fred found two fellows out in the bush skinning a fine young buck they'd brought down. He persuaded them to leave the head on, and draped the skin realistically over the bushes. Next day he brought Mrs. Stevenson that way, excitedly pointed the deer out to her as he raised his trusty rifle. "How's that?" she asked immediately. "That a deer, with snow on its back?"

It had snowed generously during the night, and the hunting husband's careful ruse failed.







## W. J. Freeman

MANY HAZARDS

worked formerly under Morrow and is now under Spalding, has worked more than two years without a lost-time accident.

The operating department of the concentrator and crushing plant are, at the time of writing, building up a new record by working since June 15 of this year without a lost-time accident.

#### CONISTON RECORDS

Coniston's part in preventing accidents has been no small one. In 1930 there were 38 accidents for every 100,000 shifts worked. In 1936 this figure was reduced to less than five accidents for every 100,000 shifts.

The entire Coniston plant has worked eight of the 11 calendar months of this year without an accident. The electrical department have had no lost-time injuries since November 1, 1929. The sintering plant has not experienced an accident since October 22, 1930. And the machine shop, which at present holds the Coniston clock record of 34,954 safe shifts, has had no accidents since May 19, 1931. Fine records such as these, and there

are many more quite worthy of mention, have helped grease the skids on which the accident frequency rate has slid to a new low point in 1936.

Don't stop the clock.

#### SAFETY FOREMOST

But even finer records will be made in 1937, if we continue our work on the safety

#### INSPECTIONS

A weekly inspection of all crane cables, slings, hooks, tongs, etc., is made by a special crew of inspectors who are responsible for the maintenance of this equipment. Fire inspectors make a weekly inspection of hydrant houses, fire extinguishers and other fire equipment. Workmen are also asked to report anything that they might consider an accident hazard and an immediate investigation is made.

#### ACCIDENT COURT

Another big factor in the success of Accident Prevention is the Accident Court. Although an immediate investigation is made at the time of the accident, important evidence is sometimes hidden, and so in order to determine the true cause of an accident and to prevent the recurrence of a similar one, a court is held on the injured man's return to work. At this court the accident is investigated from every angle and from evidence submitted by the injured man, witnesses, foremen and safety inspec-

Third year men with medallions: C. R. Howard, J. McNeill, H. O. Weaver, E. Beau-champ, W. Jarram, W. A. Gibbs, J. S. Ham-ilton, R. Dobson, J. P. Davidson, C. A. Lynden, Frank Wood, P. Kettle, N. E. Noxel, W. Ross, A. Schofield, E. Barrett, E. Rogers, E. McGratten, R. Bryan, L. Crumb, W. Eden, D. McDonald, F. H. Lymburner.

Second year men with vouchers: E. Wallace, C. Beck, D. Winger, T. Christie, H. Beck, P. Clements, C. Start.

First year men with certificates: W. Outred, A. Taylor, L. Weaver, L. Gonyou, C. Davidson, R. Elliott, W. J. Cook, D. Nixon, Schooley, W. Avery, J. Turnbull, R. White, W. Robins, E. Heintz, E. C. Lambert, E. J. Campbell, J. H. Walter, J. J. Weedmark, W. Davison.

The important feature of accident prevention is to provide safe working condi-tions, and then to make sure each employee knows how to do his work safely. large proportion of accidents are caused through carelessness on the part of the employee, it is essential to keep the attention of workers on the necessity of paying careful heed to the correct method of doing the job in hand.

#### **APPOINTMENTS**

Appointments are announced at Copper Cliff concentrator of E. H. Rose as mill supt., and K. S. Clarke as asst. mill supt.

## Handy Hat

Are safety hats worthwhile?

Many miners have had experience convincing them that the answer to this question is an emphatic "Yes!"

But for the benefit of any who don't fully appreciate the protection a safety hat affords, Triangle publishes this photograph of one just after it had done its good deed.

The Frood miner who wore it was struck by a 20-pound piece of muck which rolled along a pillar wall, bounced, fell 30 feet, and landed with consequent force on his head.

With his safety hat on, he felt only a slight dizziness from the blow. How his skuli would have stood up under the rap, without the safety hat, is a problem on which he has absolutely no desire to experiment.

Within the INCO TRIANGLE

## **Enquiring Reporter Covers Creighton Hoist**



A haggard individual, footsore and weary, dragged himself into Trlangle office and slumped into a chair. On closer inspection he turned out to be our long-lost Enquiring Reporter!

You'll perhaps recall that in our first issue last September, our Enquiring Reporter did a story on the transportation of men at Frood Mine, and we thereupon assigned him to compute how far a Frood No. 3 shaft cage would have to travel in a week, if it could only carry one man at a time. MYSTERY MAN

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For four days thereafter he muttered and mused at his desk, wrestling with the problem. On the fifth afternoon he leaned back from his labors, gave a great cry, then put on his hat and coat and disappeared completely.

It now turns out that he had estimated the Frood cage would have to travel 150,000,-000 feet in a week, carrying one man at a time. This, as any shoe-salesman would have agreed, is a lot of feet. But our per-sistent scribe, imbued with this journal's obsession for accuracy, could scarcely believe his eyes when he calculated that 150,000,000 feet is more than the complete distance around the earth. So he went out and proved it.

#### TWO TIRED DOGS

When he landed back in the office he had made the complete journey, carefully step by step, and had 18,000,002 feet left. The two extra feet were his own, however, and were in rather dilapidated condition.

For this touching display of loyalty and devotion to duty, we rewarded him with a trip to the big new No. 5 shaft at Creighton. A DEEP PROBLEM

The Creighton No. 5 shaft turned out to be a somewhat deeper problem than he had previously tackled-4,074 feet, to be exact.

Travelling the short distance from the Creighton No. 3 to the No. 5, the Enquiring Reporter was impressed with the transformation which has taken place at this spot where only a comparatively short time ago there was nothing but swamp-land and rock outcrops. Now the new headframe reaches 162 feet toward the heavens and around it the collar and boiler houses, ore-sorting plant, conveyor gallery and rockhouse, are rapidly taking final shape. The new hoist house is completed.

#### PREPARE TRACKWAY

While rivet hammers drum their swift staccato, miners around the yards maintain an even pace with their hammer drills, punching innumerable holes preparatory to blasting the rock to make way for the net-work of tracks over which the products of the new plant will be handled.

Arriving at the new steel shop, which is temporarily in use as a "dry" and office, our eager sleuth is met by J. B. Fyfe, in charge of No. 5 shaft sinking operations since their commencement in 1934, and since trans-ferred to Garson. Mr. Fyfe, he finds, is built entirely in keeping with the operations he oversees, being six feet two and a half inches in height, firmly founded with a size 12 boot.

and ladderway compartment and an airway compartment, making the total cross-section of the shaft excavation 30 feet by 18 feet. HAS BIG JOB

If he felt somewhat minimized when he stood beside Mr. Fyfe, the Enquiring Reporter finds himself positively dwarfed when he enters the No. 5 shaft hoist building and sees the huge new skip hoist. His lagging self-esteem rises, however, when he is told that it is the largest hoist installation ever manufactured in Canada, all parts totalling 1,201,500 pounds in weight. After all, its job is to maintain a flow of some 4,000 tons of nickel-ore per day from a point three-quarters of a mile within the bowels of the earth.

The new hoist is different from other Northern Ontario hoisting equipment in that it has two large cylindro-conical drums, arranged in tandem, connected by a gear train. Each drum is shaped like an immense cone, with cylindrical sections 25 feet in diameter at one end and 12 feet in diameter at the other. The drums are grooved spirally, and our correspondent is informed that the small diameter takes the initial null on the skin-load of one thus the initial pull on the skip-load of ore, thus requiring less power when the hoisting cycle begins. The unusual size of the drums, on the other hand, makes it possible for them to wind the 4,513 feet of rope in a single layer, thus avoiding excessive wear on the hoisting ropes. The latter, incidentally, are of "extra special improved plow steel," one and three-quarter inches in diameter and weighing five and a half pounds to the foot. Any doubt about their ability to handle the load on them is removed when it is stated that they have a breaking strength of about 320 000 noundet 320,000 pounds!

#### BRAKE PROTECTION

The brakes on the hoist are a model of safety. They are applied by gravity and released by means of an oil-operated engine. In case of failure in the oil lines or power supply, the Enquiring Reporter is assured that the brakes are applied automatically, and if at any time the wear on the brakes becomes excessive, a switch is automatically thrown which cuts off the power until they are fixed. A further feature makes it impossible to have the brake off and the drum unclutched at the same time, so a drum can never get out of control. In addition, the elaborate electrical equipment provides protection against overspeed, overwind, overload, etc.

All of which having been faithfully chronicled, our patient investigator is now pond-ering over how much ground the large cylindrical section of a drum on the No. 5 back wheel on Jack McNab's Rolls Royce. That should hold him for a while.



All records for interest in First Aid classes among INCO employees went by the boards this month when more than 400 men enrolled for the St. John Ambulance Association course. This is double the 1935 enrolment.

Copper Cliff and Ontario Refining Co. classes, conducted at Memorial Community Hall under Dr. R. B. Harris, totalled 175 when they commenced December 4. Creighton and Frood classes are conducted at the new Ukrainian Hall in Sudbury; the former, under Dr. K. A. McLean, had 75 members at the start; the latter, under Dr. F. M. Lively, had 150. At the schoolhouse in Coniston, where Dr. W. S. Johns supervises classes, 30 attended the opening lecture.

The series of lectures and practical work will continue until early in March. Then those who have qualified will receive their St. John Ambulance Association certificates. Following that, at each of the INCO plants inter-departmental competitions will be conducted for handsome new trophies now being made.

Then selected teams from each plant will take part in the grand finale for the R. D.

Parker trophy, and members of the winning team will receive individual medals while their plant will hold the new trophy for one year.

## Besom an' Stane **Devotees** Prepared

As soon as the season is officially opened by the annual inaugural tilt between the P. F. McDonald and George Hudson rinks, Copper Cliff curlers will settle down to a brisk winter at the roarin' game. Fifty members are expected; six sheets of ice will be in play.

Officers elected the same day President Roosevelt returned to power, are as follows for 1936-37: Honorary president, D. Mac-Askill; honorary vice-presidents, R. D. Parker, E. A. Collins; president, H. M. Stephenson; vice-president, G. M. Ferguson; secretary-treasurer, W. J. Hambley; competition secretary, T. H. Rowe.

Executive committee: President, vice-president, George Hudson, W. W. Henderson, P. Bregman.

Rink committee: T. H. Rowe, P. Mc-Donald, A. McIntyre, W. J. Jessup, W. Munck, Jas. Hudson, F. Dubery, S. Smith.

## **Bane of Picnics and Prairies**, Sand Is Salt to Smelter Soup

Sand in the sandwiches or in the salad may be one of those things to which you resign yourself on a picnic at the lakeshore, but it seldom brings gurgles of gastronomical delight from daddy's throat.

Sand in the hair and in the moustache, and even lurking in the folds of the elder-down quilt, is rapidly becoming a quaint old Canadian custom for denizens of parts of the western plains where a dust storm is liable to hop out of the clothes hamper or glide from under the chesterfield on the slightest provocation. But the red-eyed natives derive no great joy therefrom. Yet in Copper Cliff and Coniston sand is

to smelting what salt is to soup.

#### 2,700 TONS A DAY

With the addition to the Copper Cliff smelter operating at capacity, INCO's daily sand consumption will be in the neighborhood of 2,700 tons. Here's what for:

The copper-nickel ores contain a large quantity of iron, in the form of iron sulphide, and this must be removed during the smelting process. When air comes in contact with sulphide ores at high tem-perature, the iron sulphide is changed to iron oxide.

Sand contains a substance called silica which has the power of combining at high temperature with iron oxide to form iron silicate, and this is the chemical action which takes place when copper and nickel concentrates have become molten charge. The iron silicate separates from the matte, rises to the surface, and is skimmed off as slag.

#### NOT JUST MAGIC

Thus, presto! the iron is removed, although it isn't all quite as simple as the flick of a magician's wrist, or anything like that.

For the nickel reverb furnaces, the sand is mixed with the nickel concentrate before it enters the roasters.

Copper concentrate does not pass through the roasters, however, but is routed straight from the concentrator to the storage bins above the reverbs, so the sand is mixed with the concentrate as it is being drawn from the bins and fed to the reverbs.

A large percentage of the iron is removed in the reverbs, but further treatment is

needed. So, in the converters, at the beginning of each "blow" as described in the last issue of Triangle by Nathan Crawford, several tons of sand are forced onto the surface of the molten charge through a "gun" at the end of the converter by means of compressed air.

Finally, the iron and other impurities removed, the copper and nickel mattes pass on to the next stages of operation. The nickel converter matte, called Bessemer matte, goes to the Orford department. The blister copper goes to the refinery. In each case, sand has performed its invaluable function.

#### FROM GARSON PIT

Sand for INCO's operations comes from the big pit at Garson, which has an unusually high silica-content, and which promises a reserve sufficient to take care of requirements for several years to come.

To excavate the sand with the greatest possible efficiency, INCO recently placed in operation at the Garson pit a big electric caterpillar shovel, which, with each thrust of its rugged dipper, is capable of lifting two and one-half cubic yards, or 3.62 tons. of sand.

On a test it loaded 3,500 tons in six and one-half hours of actual working time. Delays to the shovel incurred while cars were being switched and spotted to receive their loads totalled one and one-half hours, so the new shovel makes it possible to ship 3,500 tons out of the Garson pit in eight hours.

The sand is loaded into 70-ton railroad cars and is hauled to Copper Cliff and Coniston for storage.

#### WEIGHS 140,000 POUNDS

The new shovel weighs 140,000 pounds and requires a ballast of 20,000 pounds, so that its working weight is 160,000 pounds. Here are some of its dimensions:

Length of boom, 27 ft. 6 in.; length of Length of boom, 27 ft. 6 in.; length of dipper handles, 19 in.; dump radius at maximum height, 31 ft. 6 in., maximum dump height, 18 ft. 5 in.; height of cut, 27 ft. 3 in.; radius of level floor, 25 ft. 4 in.; depth of cut below grade, 7 ft. 7 in.; height of cab, 14 ft.; width of cab, 10 ft. 6 in.; length of caterpillar tread, 15 ft. 5 in.; width of caterpillar tread, 30 in.; diameter of hoist drum, 26 in.

#### December, 1936

#### PERFECT CONTROL

For the trip underground, the reporter enters a five-by-twelve-foot nickel-alloy steel cage, similar to those at Frood No. 3 shaft, and used for hoisting men and supplies. Down, down goes the cage, past the 23rd level, 30 level, 36 level, and finally making the first stop at 42 level, 2,825 feet below surface, the first level of the new operations. After a brief view of the 42 level station. which is similar to those he saw at Frood, the cage travels downward again, under perfect control of the hoistman more than half a mile away at surface.

The cage stops above the 48 level, then starting the drifts away from the remaining stations on 48, 50 and 52 levels.

#### 10.820-LB. SKIPS

At the bottom of the shaft, 4,000 feet below surface, the scribe finds that concrete has been poured for the loading pocket, and men are installing the loading chutes and measuring boxes which will deliver the ore at the rate of 225 tons per hour into the nine-ton nickel-alloy steel skips, each of which will weigh 10,820 pounds. He is told that on completion of the ore-pass system, all ore from the 23rd level down will be hoisted from this point, after being crushed in the crusher station at 52 level. On the return journey to surface, he learns that the completed shaft will have two ore-hoisting compartments, in which the skips will operate in balance. There will also be a pipe



**Group** Policy

It is not only in the event of death that the low-rate Group Insurance available to all INCO employees proves to be a wise and fortunate investment. Disability from accidents is another tragedy in which the stricken family can turn to the Company's insurance department for advice and assistance at the time when it is most needed.

An example, taken from the department's files, shows the value of this service: This man met with an accident while at

his work which resulted in the loss of his eyesight. He was 33 years old, married, with three young children.

#### HAD GROUP POLICY

Fortunately for them all, he was insured for \$2,500 under the INCO Group Insurance He made claim for total permanent plan. disability and payment of his claim was approved. To this was added his monthly settlement from the Workmen's Compensation Board.

With this capital he had an opportunity to readjust himself, and the Company's In-surance Department advised him that the logical thing to do was to secure a home with some land surrounding it in a small town where living expenses would be lower and educational facilities for his children available.

#### **KEY TO HAPPINESS**

This he decided to do, and with his insurance money he was able to acquire a comfortable home in a nearby village where he moved his family and where he is now living happily and with a contented mind.



The big new electric shovel at Garson Sand Pit