

INCO TRIANGLE

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A Crucial Decision in the Making

(STORY ON PAGE 11)





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Proven Reserves Keep Ahead of Record Output

Although International Nickel delivered a record 518,870,000 pounds of nickel in 1970, its exploration program in Canada enabled it to more than replace the ores mined during the year. On December 31 it had proven ore reserves of 383,300,000 dry short tons containing 12,500,000,000 pounds of nickel and 7,900,000,000 pounds of copper, almost identical to reserves announced at the end of 1969.

The Company spent \$31,889,000 on exploration last year, compared with \$19,896,000 in 1969, and employed an average of 1,600 persons on exploration projects in Canada and abroad.

Lateritic Projects Progress

"Although we expect to look for and develop sulphide ore bodies in Canada, the great bulk of the known deposits of the world are lateritic, found mainly in the tropical areas of the world," Henry S. Wingate, chairman, said in a message to the Company's shareholders included in the annual report issued March 8. "International Nickel, either in partnership with others or by itself, has rights in such deposits in Guatemala, New Caledonia and Indonesia. In 1970, we made progress in moving all of these toward stages where construction could be launched."

Inco's record nickel deliveries last year compared with 382,170,000 pounds in 1969, when the 128-day Ontario division strike cut production, and 480,840,000 in 1968. Copper deliveries rose to 348,100,000 pounds in 1970, compared with 208,220,000 pounds in 1969 and 314,160,000 pounds in 1968. Platinum-group metals and gold in 1970 totalled 387,700 troy ounces, down from 421,500 in 1969 and 440,900 in 1968.

Record Net Earnings

Mr. Wingate described 1970 as "a year of solid achievement" for the Company. Its net earnings of \$208,591,000 reached a level essential to support the large

The Consummate Artistry of J. Frost



For a second there the Triangle's Derek Wing thought he had a horticultural miracle outside his kitchen window in Lively — a new bush springing to maturity overnight in the middle of winter! But of course Mother Nature's staff artist, J. Frost, had created this startlingly realistic illusion on the window panes, working silently while everyone slept.

capital expenditures it is making to expand its production capacity in the light of the growing free world demand for nickel, which last year consumed an estimated total of 985,000,000 pounds compared with 844,000,000 in 1969, the previous record year.

In Canada, Inco spent some \$650,000,000 in 1966-1970 on its expansion and modernization program, and expects to spend an additional \$450,000,000 in 1971-1972. Overall, it made record capital expenditures of \$272,465,000 in 1970, compared with \$175,182,000 in 1969. It expects to make capital expenditures of \$300,000,000 in 1971, of which \$255,000,000 is expected to be spent in Canada.

To help finance its large capital expenditure programs, the Company increased its long-term debt during 1970 from \$184,314,000 on January 1 to \$286,660,000 on December 31. The year-end figure represents 21 per cent of the Company's total capitalization of \$1,339,195,000.

Huge Goals in Sight

International Nickel expects to produce about 550,000,000 pounds in 1971. In 1972 it expects to achieve the goals of its expansion and modernization program and be operating in Canada at a rate of more than 600,000,000 pounds of nickel a year. The program to increase Canadian production capacity is based largely "on the Company's faith in the growth of the nickel market, founded to a considerable degree on our demonstrated ability to expand nickel uses," the chairman said.

Rising nickel production, and the softening of the economies

in the principal nickel-consuming countries, were cited as the reasons why "early in 1971, the shortage that had characterized the free world's nickel market since 1966 came to an end."

Mr. Wingate said that taxation programs applicable to the mining industry must recognize the facts of heavy capital expenditures, plus additional expenditures for environmental control programs — which International Nickel is carrying out "at a rapid pace."

Not only did the mining industry carry the risk of non-discovery, but the lead time required for new developments, and the capital intensiveness involved, materially differentiated mining from manufacturing industries.

He said he was hopeful that Canadian tax reform legislation, now expected to be introduced

this spring, "will be in the long Canadian tradition which recognizes the unique aspects of the mining industry and its very far-reaching contribution to the country's economic growth."

"Can Only Deter"

He expressed regret that the Province of Manitoba has increased income and mining royalty taxes. "Such high taxation can only deter new mining investment and expansion in the province."

Communities and nations that benefit from the wealth created by mining "should not through taxation policies deter the very economic progress from which they benefit," the chairman declared. "It is clear that ore bodies most likely to be developed will be in the areas that, by taxation and other policies, encourage, or indeed make possible, their development."

Honor "Native Sons" At Annual Dinner

Two Inco vice-presidents, Dr. Louis S. Renzoni of New York, special technical projects, and John A. Pigott of Toronto, operations, were among five Sudbury area "native sons" specially honored at a banquet in the Italian Hall, Copper Cliff, on February 12.

At its 75th annual dinner the Sudbury and District Chamber of Commerce presented the honored guests with specially designed desk pen sets, created from ores from five Inco mines, showing the four smoke stacks at the Copper Cliff smelter.

James R. Meakes, publisher of the Sudbury Star, born in Sudbury, Clifford A. Fielding, president of Fisher Construction and Wavy Industries, born in Waters Township, and Senator Rheel Belisle, born in Blezard Valley, were the other three distinguished "local boys who made good". Mr. Pigott was born in Meaford but brought to Coniston by his parents as an infant, and Dr. Renzoni was born in Copper Cliff.

New Executive Vice-President on Visit



About to embark on his first trip down a mine shaft, executive vice-president Edward Grubb smilingly asks Levack caretaker Alpheo Mallette for "a nice gentle ride". With International Nickel in many executive capacities since 1934, Mr. Grubb, who has succeeded F. Foster Todd at Toronto, made a brief "getting acquainted" tour of some of the Sudbury area operations last month. On the right he chats with Ontario division comptroller George Burns.



A ROASTER KILN boss at the iron ore plant, Ray Mayer started with the Company in 1953 at the pilot plant in Coniston, where the Inco iron ore recovery process was developed. He calls Noelville his home town. In this attractive group with him are his wife, Jean, Norman, 12, and Gary, 7. This summer, the Mayers will leave their Sudbury home for a camper trailer holiday on Canada's east coast, an experience they're eagerly anticipating.



WITH ALL THOSE gentlemen in the family, 13-year-old Cathy Cvar and her mother, Frances, should be well waited on at their Sudbury home. Ivan, the father of this handsome brood, works in the salvage department at Creighton No. 5 mine. In the back row with Cathy are Ivan, 14, Phillip, 15; in front with Mom and Dad are Tom, 7, Mark, 8, and Eddy, 11. Ivan came to Canada from Yugoslavia in 1948, and started with the Company in 1949. His chief hobby is woodwork. Mrs. Cvar is the daughter of Creighton pensioner Frank Tanko.

INCO FAMILY ALBUM

NEW YEAR'S greetings were special at the Bob Chaloux residence in New Sudbury—Bob's wife, Anne, gave birth to little Jimmy on New Year's Eve, a brother for Wendy, 7, and Davey, 5. Bob started with the Company in 1964 and is senior clerk in the yards and transportation department at the copper refinery. Anne's father, Ainsley Roseborough, is a shift boss at the Copper Cliff crushing plant. Bob's hobby is building an impressive historical collection of military paraphernalia. Anne is completing studies in social work at Laurentian University.



SEVERAL TROPHIES around the Azilda home of Romeo and Marie-Jeanne Rouleau attest to their skill at bowling, a sport the whole family enjoys. Shown here with their parents are Carmen (Mrs. Ed Laurin), Paulette, 20, and Bernard, 14. A furnaceman in the Copper Cliff smelter roaster department, Romeo has been with Inco since 1941. He likes snowmobiling and going fishing.



DICK LINDENBACH, who works in the ventilation department at Frood mine, came to Inco in 1951 after railroading for four years in his home province of Saskatchewan. Much of Dick's spare time these days is taken up by municipal affairs—he has been the reeve of Valley East Township for the past two years. An annual moose-hunting trip to the Atikokan, Ontario area, along with snowmobiling with his family around his Val Caron home, are his favorite recreations. From left to right in our picture are Donna, 16, Danny, 14, Dick, Niel, 3, Dick's wife, Ramona, and Pat (Mrs. Steven Szarko).

JOINING THE merchant marine at the outbreak of World War 2, George Stepanchuk sailed the high seas and the inland waterways for 12 years, then came back to his home town, Port Colborne, and married "the girl next door", Irene Sutherland. With Inco since 1955, he is a ladleman in the anode department, and very sports-minded. The happy Stepanchuk children are David, 14, Brian, 9, and Janet, 8.



TOWN'S DREAM COMES TRUE



Ginette Di Matteo, Linda Arsenau, Kathy Boyd, Nicole Laprairie.



Proudly wearing his Canadiens uniform is David Wilkinson.



As many as 350 of all ages have turned out to the public skating sessions in the bright new rink.



Little Lori Henderson gets first lesson in the spiral from figure skating "pro" Susan Metcalfe.

Coniston Rejoicing in Community Centre

Coniston people are walking tall these days, basking in the satisfaction of having realized another major objective. The big moment came on the evening of February 8 when, in the presence of an impressive assembly of council and townspeople, officials of local organizations and neighboring municipalities, and members of parliament, Mayor Mike Solski formally declared the Coniston Community Centre open for everybody's enjoyment.

Native Sons Honored

Done up in high style, the opening ceremonies included an overflow banquet at the Club Allegri. Six native sons who made the "big time" in hockey over the years were presented with cuff links engraved with the Town of Coniston crest, and pen sets mounted on nickel ore.

The Coniston Band, directed by Dan Totino, and Sam Lade-route with three of his pipers from the Copper Cliff Highlanders, gave musical class to the occasion. Two dances wound up the big night.

Leading the parade of hockey heroes was "Toe" Blake, member of the Hockey Hall of Fame, who after a brilliant 12-year playing career with Montreal Canadiens coached the club to eight Stanley Cups in 13 years, including an unprecedented five in a row from 1956 to 1960. Other honored "greats" present were Andy Barbe, now of Pittsburgh, Leo Lafrance, now of Duluth, George Blake, now of Waterloo, and Armand Lemieux of Coniston. The sixth big-league native son, Noel Price of the Los Angeles Kings, received his presentation by long-distance telephone in a conversation with Mayor Solski which was amplified through the Centre's loud-speakers for all to share.

Youth Well Organized

But Coniston isn't leaning on its star-studded past — it's deeply committed to the present and future of its rising generation, as

the sparkling new Centre testifies. There are already 230 boys from 5 to 17 registered in 17 minor hockey league teams of Squirrels, Atoms, Bantams, Pee-wees and Midgets, with Sylvio Jean as president and a full complement of dedicated volunteer coaches. And there are 185 enrolled in the skating classes launched last year by the YMCA and now under the direction of a professional, silver medallist Susan Metcalfe of the Copper Cliff Figure Skating Club.

Although it's the tag end of the season, and rink activities won't really hit high gear until next fall, the plant shift league, daily school hockey, and a daily two-hour period when mothers and their tots have the ice to themselves, (Continued on Page 7)



Mayor Mike Solski snips the ceremonial ribbon at formal opening of Centre. Assisting is honored guest Andy Barbe, Pittsburgh.



Coniston's all-time hockey great "Toe" Blake of Montreal, was honored. Posing beside his picture in Centre is young Jim McIntyre.



Chris Veno, at 9 already a real pro prospect, is shown giving goalie Jamie Boyer an anxious time as Wolves, coached by his father Charles, beat Eagles 3-2 in league game in Atom division.



D'Arcy Olivier, Tubby Halverson and Alme Barbe turned on the adrenalin as Old-Timers whopped Rivard shift 9-4. Goalie Lionel Leclair (right), is cleanly beaten by Olivier's sizzling slap-shot.



At the end of another safe shift, miners at Murray arrive at surface and head for the dry to shower and change. **BELOW:** Waiting for their cage, a group takes a proud look at the All-Mines safety championship trophy, Murray's to keep for another year.

Iron Ore Plant and Murray 1970 Inco Safety Champions

Iron Ore Plant and Murray Mine emerged victorious in the 1970 annual safety sweepstakes for the Ontario Division.

In the race for supremacy among processing plants, Iron Ore repeated its front-running performance of 1969, followed by Copper Refinery in second place, Port Colborne Nickel Refinery third, and Reduction Works fourth.

Murray, which had shared the All-Mines trophy with Levack in 1968, came on strong to nose out Creighton for 1970 honors after finishing second to Garson in 1969. Order of finish for the rest of the field last year was: 3, Levack; 4, Crean Hill; 5, Frood-Stobie; 6, Garson.

General manager John McCreedy extended warmest congratulations to both winners, and challenged all mines and processing plants to redouble their accident prevention efforts.



There's a message for all the men at all mines and all plants in the Murray victory banner shown above: "PRODUCTION WITH SAFETY—SAFETY WITH PRODUCTION. A continuing desire, dedication, determination and team spirit will carry the ball in 1971". Can Iron Ore and Murray stay on top?

LEFT: Representing every department, these Iron Ore Plant men pose with the All-Plants safety championship trophy they and their fellow-workers won in 1970 for the second year in succession. **BELOW:** IORP's continuing leadership in Inco processing plant safety came in for a lot of pleased comment in the lunch-rooms.

to make 1971 a banner year for safety throughout the Ontario division.

The two victors were presented with the handsome trophies sculpted in wood by Creighton's Charles Paxy for annual competition.

Awarding of the championships is determined by the relative standing for the year of each mine or plant in three categories, lost-time-injury frequency per million man hours, all-accident frequency per million man hours, and all-accident severity per million man hours. The best overall performance in each case is the winner.



Basketball Loop Toning Muscles At Port Colborne

Sparked by a handful of former players itching to work off excess energy in the winter months, and tone up those soft muscles, as well as having some good fun, the Port Colborne Municipal Basketball League was formed last fall.

The four teams competing in the 15-week season now drawing to a close represent City Hotel, Public School Teachers, City Mailmen and Inco. They each play one game a week on Friday nights, plus regular practices, at the Inco Recreation Hall.

Playing coach and manager of the Inco team, No. 2 research station foreman Brian Ewing, checked over the ages of his



Inco's Larry Torok leaps to grab a rebound and dump it into the basket. Others shown are Ralph Williams, Inco, and Rod Scott, McKay senior public school.

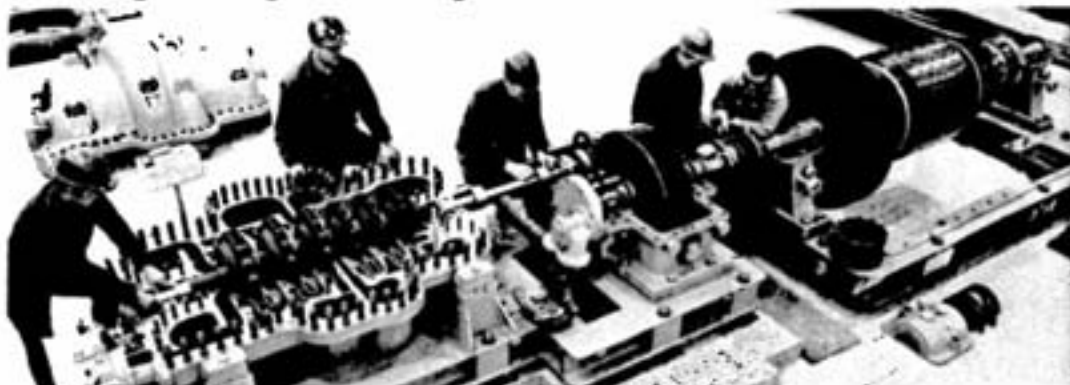
players and discovered that their average is 27. "We're no spring chickens," he said, "and most of us haven't played the game seriously since high school or college. There was plenty of huffing and puffing in the beginning but we're all in pretty good shape now." He expects the league will be six teams strong next season.

Inco team members not seen in the above picture are: Roger Agnew, Gil Landry, Joe Tober, Bill Bilodeau, Nick Balliw, Doug Hoyle, Keith Colburn, Nick Markovich, and John Wethrup.

Melodic Metal

A pure nickel overwrap of very fine wire is used on high-quality strings for musical instruments to give them the right pitch and resistance to corrosion.

Highest Speed Compressor to Serve South Mine



In the final stages of assembly, with most of its internal moving parts exposed, this 3,550-hp Brown-Boveri centrifugal compressor will soon be supplying air at the rate of 12,000 cubic feet per minute, and at a pressure of 110 pounds per square inch, for the operation of pneumatic equipment at the Copper Cliff South mine. Development work is continuing at this new mine, and production has started on a limited basis.

Seen at the left, the six-stage impeller will revolve at 12,085 revolutions per minute, and at that rate will claim the distinction of being the highest speed compressor in

use in Inco's Sudbury area operations.

The motor armature, seen at the right of the picture, will turn at a modest 1,800 rpm. The single helical gear speed increaser unit, located between the armature and the impeller, has a ratio of about seven to one.

Heat generated during compression raises the temperature of 70°F input air to 350°F. Circulation through an inter-cooler and an after-cooler maintains a discharge air temperature of 100°F. Water used for heat transfer in the coolers is recirculated after its passage through a cooling tower located

adjacent to the compressor building.

The lighter-colored assembly just left of the large increaser gear is a direct-connected gear pump that circulates lubricating oil at 71 psi, with a system capacity of 350 gallons.

Seen on the job, members of general engineering's highly skilled electrical-mechanical section installation crew are Bob Gardner, foreman Mickey Smrke, Willis Burndt, Glen Johnston, and Brown-Boveri expert Hubert Frel. Overall supervision of the project is the responsibility of Inco's mechanical installation specialist, Lloyd Johns.

Coniston Rejoices

(Continued from Page 5)

are well-organized. Family participation is prominent in the regular public skating sessions. Outside organizations, like the Azilda church hockey league and the Wahnapiet Recreation Association, are applying for scheduled ice time.

Strongly Supported

The \$280,000 Centre has been supported by subscriptions to date of \$116,000 from individuals and various organizations. When the donation list is closed, the balance will be covered by municipal debentures. Leading the 40-can-

vasser financial campaign with Mayor Solshi were Councillors Tom Paradis, Joe Barbe and John Fera, along with secretary Prosper Olivier, Tepper Caverson, Tommy Hoare and Fern Leblanc.

Except for seating for 1,500 spectators, a heating plant, and smaller details to be completed this summer, the well-designed Community Centre is modern in every respect. The regulation artificial ice surface, 85 x 185 feet, is conditioned by a Zamboni scraper and flooder. Opening off the entrance lobby is a large hall suitable for meetings and social functions, with a kitchen and snack bar in connection.

Offices and dressing and storage rooms complete the layout. Leo Poirier and Loris Bardeggia of the Inco general engineering department gave extensive assistance to secretary Prosper Olivier in overseeing construction.

Appointed manager of the Centre is Earle Freeborn of Chapleau. "This town is just loaded with community spirit," he said. "I'm getting every possible co-operation. We've got a great thing going here."

The trouble about many people who boast about having an open mind, is that they usually have a mouth to match.

In-Depth Studies of Human Relations Management

Attended by a total of 30 members of top Inco management from Thompson, Port Colborne, Toronto and the Sudbury area, two week-long executive sessions on the skills of "Human Relations Management" were conducted at the Company's training and development institute in Sudbury February 14-19 and February 25-March 5.

Warren G. Orr, corporate manager, organization development, and G. S. Thomas, staff manager, training and education, were in charge. Mr. Orr is shown in the accompanying picture during a session.

Each group "lived in" for its seminar, keeping to a rigorous



schedule of day and evening studies. The course, involving thorough discussion of all facets of modern human relations in large industrial enterprises, is part of the Company's broad long-range program for skill development of

executives, supervision and employees at the new institute.

It was arranged under the direction of Duncan A. Wallace, director of personnel, Canada, and Leo Pevato, supervisor, training and development, Copper Cliff.

**RENE GAUTHIER**

A new house on the 160-acre family farm at Whitefish is home to Rene Gauthier, his wife Lorraine and their 5-year-old son Pierre.

Rene started his Inco career in the converter building at Copper Cliff in 1966, and swapped tuyere-punching for mining at Crean Hill the following year. A trackless jumbo driller, he is seen at the controls while driving a development drift on the 470 level.

Moose hunting is the favorite of Rene's off-the-job activities, and he reports that his forays into the bush around Chapleau during the past three hunting seasons have been successful. His prize last fall tipped the scales at 600 pounds. His

steady partner on the moose trails is his father, an active and agile 71.

**CHRIS DAVIS**

It could be said that Chris Davis, who was born in Sydney, Australia, and is now a graduate engineer in the mine engineering office, started his long journey to Inco and Crean Hill at the age of four when his parents moved to England. He took a side trip to Lapland in 1969 to work as a summer student before his final year of study at London University's Royal School of Mines.

Recruited by Inco representatives in England, he joined the Company late last year.

Single and 21, Chris often thinks longingly back to the times when he and his pals acted as the university's unofficial wine-tasting committee. Asked if it is true that wine tasters do not swallow the sample but merely rolled it around the palate, he grinned and shook his head. "Not as far as I'm concerned," he said, "there wouldn't be much fun in that, would there?"

BERNIE SCHMACHTEL

A post clerk on the floor of the Toronto Stock Exchange before he switched to Inco in 1967, Bernie Schmachtel changed jobs on account of noise. "You'd never believe the racket that the traders create," he said. "It's

Meeting People in a Walkabout at CREAN HILL MINE



not so quiet in some parts of the mine either, but at least here I can shut out the noise with earmuffs."

A long-hole driller, he is seen on the 1400 level while preparing to drive a slot for a blast hole stope.

Now 25, Bernie was born in Salzburg, Austria, came to Canada with his parents in 1952, and attended school in Winnipeg and Oakville. He and his wife Cheryl and their two daughters live in Whitefish.

Bernie is happiest when he's zooming around in the wide blue yonder. He qualified for his pilot's license last year. His burning ambition is to own and commercially operate a helicopter.

**CLIFF CORBIERE**

A Canadian Indian, Cliff Corbiere lives on Manitoulin Island, or "Odawa-minis" — the Isle of the Ottawas, as it is known by legend to the more than 2,000 members of the Ojibway and Ottawa tribes who reside there.

A diesel loaderman, Cliff travels close to 190 miles a day commuting between Wikwemikong, at the west end of the

Manitoulin, and Crean Hill. He drives with five others who work at the mine.

Cliff started his Inco career at Copper Cliff in 1960. He punched his last converter tuyere there in 1964, and took up the tools of a mine beginner at Crean Hill. Before taking over the controls of a load-haul-dump machine, he filled the jobs of skip tender, chute blaster, switchman, and motorman.

Home to Cliff and his wife — Stella Recollette before they were married in 1964 — is a house he built in 1969 on his family's quarter-section farm near Wikwemikong where he was born. They have four children, Roseanne, Harold, Allen and one-month-old Laurie-Anne.

**GEORGE TALBOT**

A steady flow of drill steel passes through the mine warehouse on its way to the underground working areas. Seen here checking stocks of various lengths and diameters is storeman George Talbot.

An Incoite since 1964, George joined the Company at Murray Mine, where he was a slusher-man before his transfer to the surface plant at Crean Hill in 1970.

Married in 1964, he and his wife Lorraine (Belanger) have two children, Joanne, 4, and Donald, 3 months. Born in Sudbury, George still lives there, averaging about 45 minutes for the 30-mile trip from the city to Crean Hill.

Bowling enthusiasts, George and Lorraine can be found scattering the 10-pins four nights a week during the season. George has been instructing youngsters in the game for the past two years.

**RON AUTIO**

Ron Autio has worked at Crean Hill since he came to International Nickel in 1957.

A surface crane-man with the mine's yard crew, Ron is pictured behind the wheel of a 115-horsepower diesel-driven Pettibone Cary-Lift.

Before his move to surface last year, he worked on most levels of the mine as a diamond driller, slusher-man, motorman, and diesel loaderman.

Born in Sudbury, Ron married Helen Tuomula of Whitefish in 1960. Together with their 7-year-old son Brian and Buck, their German Shepherd, they live on a 33-acre farm on the Fairbank Lake road near Worthington.

CATHY HUNTER

Personnel records show that there are 408 people employed at Crean Hill. Two of that total are female and one of those two is attractive Cathy Hunter, records clerk in the mine's engineering department.



"I just love the work," enthused Cathy, "and the guys are just great. I never had so much attention in my whole life."

A graduate of Lively High School who later studied accounting at Cambrian College, 19-year-old Cathy is the daughter of Copper Cliff power department distribution foreman Jack Hunter. Her sister Rhoda is a key punch operator in the data processing department at Copper Cliff.

Cathy was photographed while inking in long-hole drilling layouts, one of her regular daily duties.

Off the job Cathy enjoys sewing, swimming at the family camp on Lake Agnew — "and dancing — what girl doesn't!" She lives in Lively.

DAVE FROST

A first class maintenance electrician, Dave Frost is seen while making the daily inspection of the mine's drum hoist. Beside him is one of the two 1,100-hp hoist motors which are connected in tandem.

Dave spent the first year of his life in England, but grew up



in Nelson, a town at the northern tip of New Zealand's South Island.

He served a five-year elec-

trical apprenticeship "down-under", spent several years plying his trade, then in 1968 made a holiday trip to Mexico that had far-reaching effects. Instead of returning directly to New Zealand, Dave detoured to England, stayed there for 18 months, and then spent half a year in Germany. Back in England, he made contact with an Inco recruiting team and late in 1970 was headed for Canada and Crean Hill.

"I feel quite at home in Northern Ontario," he said. "The unspoiled bushland here is very similar to what I was used to in the old country." In his 32nd year, Dave is still foot-loose and fancy free.

KAUKO MANNINEN

A construction leader, Kauko Manninen was photographed while installing a 36-inch ventilation pipe on the 500 level of the mine.

Kauko was born and grew up on a Beaver Lake farm near



Worthington, joined Inco at Copper Cliff in 1960, and worked at Creighton mine for two years prior to his move to Crean Hill in 1964.

He and his wife — Sheila Kautiainen before they were married in 1965 — live in Whitefish, and are the proud parents of 18-month-old Melissa.

Kauko has three brothers who also work for the Company, Ilmari and Albert at Crean Hill and Alec at Levack.

He's a keen ice fisherman; his best catch this winter included a 9-pound lake trout which he hooked in Lake Penage.

PAUL PAASILA

Born in what was then Port Arthur, Paul Paasila came to Crean Hill via Copper Cliff, where he was an Orford building skimmer, and the iron ore plant, where he was a crane operator for two years. He joined the Company in 1959.

A construction leader, Paul was building a gangway chute



between a shrinkage stope and the 1,400 level tramway when the Triangle paid him a visit.

Pushing 40 and still single, Paul confided that he finally popped the question, Elsie Salo said yes, and they will be walking the aisle in the near future.

Paul loves the outdoors. His winter activities include long cross-country ski hikes and ice fishing; summers he enjoys at the camp he has owned for the last six years on Ella Lake. "She's a great lake for pike and bass," he said, grinning. "I don't know of any better in this district."

VIC CRAWFORD

On surface in the mine's welding and plate shop, the Triangle camera caught this shot of welder Vic Crawford as he was chipping a bead on a steel door frame.

From his home town of Guelph he came to Sudbury with his parents in 1942. During his



three-year hitch as an infantryman with the Princess Pats he was stationed in Korea for 12 months.

Vic started with Inco at Copper Cliff in 1954, and worked as a crane operator and as a skimmer before moving to Crean Hill rock house in 1965. Ambitious to upgrade himself, he put five weeks of special leave to good use in 1967 by attending vocational school in Toronto to learn the welding trade.

Marion Secord and Vic were wed in 1957. They have a family of three and a home

beside Clear Lake, just south of Espanola.

BRIAN LASHBROOK

Hand on the brake wheel, car loader Brian Lashbrook is shown easing a loaded 80-ton ore car down the grade from the mines surface bins to start its journey to the Copper Cliff crushing plant.

A native of Parry Sound, Brian worked for the CPR at



Little Current before joining Inco at Crean Hill in 1969.

A 21-year-old, he was married to Beverly Berry of Espanola last year; they live in Espanola.

The golf course claims much of Brian's free time in the summer. During the long winter evenings he enjoys writing short stories and plays. "Nothing's been published," he said, "I don't write for profit — just for the pleasure of putting my thoughts on paper."

SAFETY MAKES SENSE

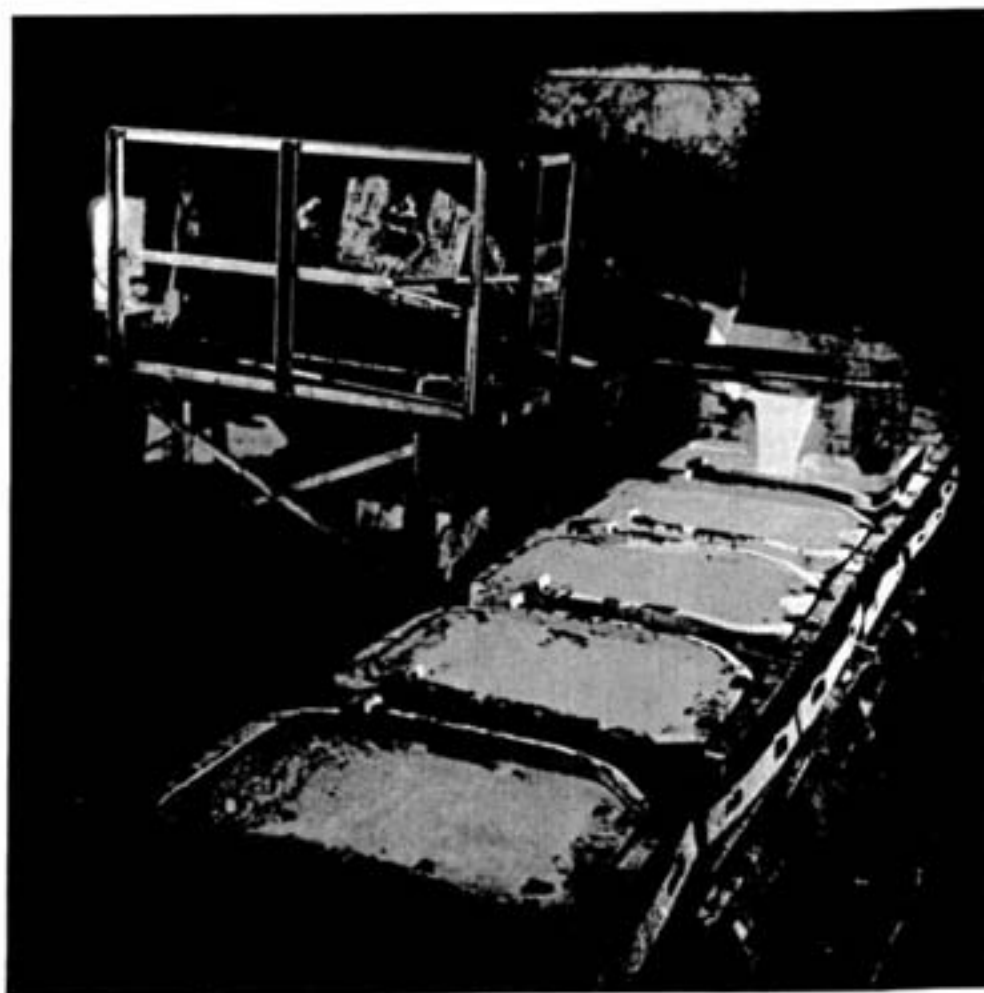
Wear your glasses, the boss-man said,
Keep your safety helmet on your head,
Wear safety boots to guard your toes,
Near moving machinery, no ragged clothes,
Clean up the place when the job is done,
Obey all signs and walk — don't run,
Some may resent these rigid rules,
But safety was made for men, not fools.

Let's face it boys, we're here to stay
To punch a clock and earn our pay,
We may change jobs, and companies too,
But wherever we go there's a job to do,
A job to pay our groceries and beer,
The wife to dress, the kids to rear,
So follow safety and use your head —
You get darn small cheques
From a hospital bed.

Arnold Zimmerman
Garson Mine



A technicolor drama that's been running for many years at the Port Colborne nickel refinery, the casting of metal anodes calls for skills and intuition that rank it as an art as well as a science.



Although they're made in much smaller quantities, sulphide anodes also put on a very good show when they're being cast from the travelling ladle car. Anodes, weighing 500 pounds each, are the second-last stage in the production of pure electrolytic nickel.

Making Nickel Anodes at Port Colborne

The Second-Last Step to Purity

A brilliant spectacle that never fails to stop a plant visitor in his tracks — especially at night when the contrast is more vivid — anode casting at the Port Colborne nickel refinery is a fascinating display of metallurgical fireworks. Creamy white as it is tapped from the furnace at a blistering 2800 degrees F, the lively metal slowly cools in the casting wheel moulds, phasing through brilliant oranges into gradually deepening reds until it finally subsides to a prosaic mottled gray as it solidifies.

The faces and figures of the men who carry out this smooth-flowing operation, and the entire area in which they work, are bathed in a soft glow of varying color that provides a dramatic backdrop to the scene.

Nearing the End

Anode casting is the second-last step in the long and complex process that transforms raw 1% nickel ore into silvery 99.99% pure nickel. Each of the many steps, some gigantic in scale, is a mechanical or chemical procedure performed with the greatest possible precision and safety, to steadily increase the concentration and purity of the metal. Anode casting is getting right down to the nitty-gritty of the business — the next stage is electrolytic refining to produce the final product.

"The main function of this department," said superintendent Jan Van Dillen, "is to convert nickel oxide sinter and nickel sulphides from Copper Cliff, along with sulphides from Thompson, into anodes for the electrolytic process. We make primary metal anodes and primary sulphide

anodes, by similar but separate methods."

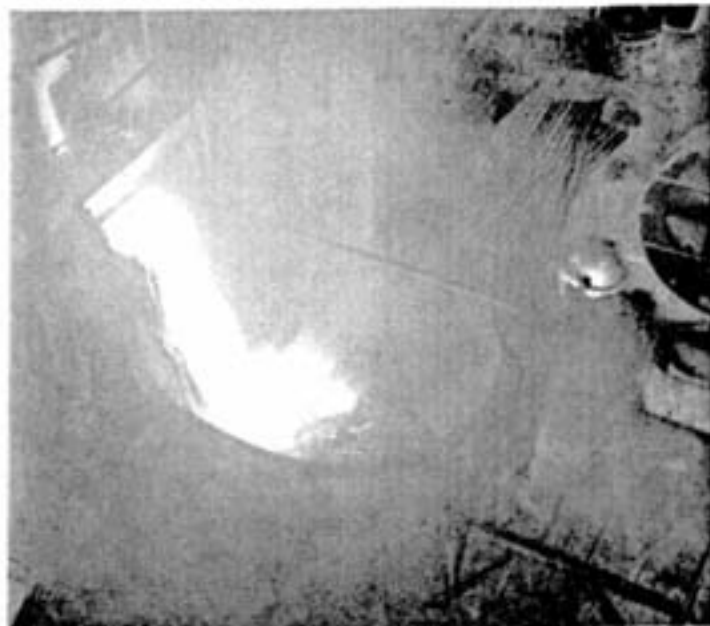
Metal anodes are 500-pound slabs of impure nickel, measuring approximately 3½ feet high, 2½ feet wide, and 2 inches thick.

"About 80% of our production is metal anodes, containing 93% nickel, with copper, cobalt, iron and sulphur making up the balance," continued Jan. "They are made from nickel oxide sinter shipped to us by rail from the fluid bed roaster department at Copper Cliff, which contains about 72% nickel as we receive it. So here is a clear example of increasing the concentration of metal in successive steps in a metallurgical operation."

"In making sulphide anodes, on

ON THE COVER

Furnaceman Ugenio Comazzolo and foreman Bob Barton closely examine a quenched sample button of metal taken from an anode furnace. By the shape these samples take after sudden cooling, and their color and texture, the experts can tell how soon the furnace will be ready for tapping.



Metallic impurities rising to the top of the molten bath in the furnace are skimmed off as slag, using steel rabble. Cover over pot was removed for photograph.

the other hand, our department can take credit for only a small increase in the concentration of nickel; the big boost takes place in the electrolytic process. The nickel sulphides we receive come from the matte separation department at Copper Cliff, and from the Thompson smelter, and contain about 68% nickel."

Mixed with Coke

The finely particled nickel oxide sinter used for making metal anodes is conveyed, on arrival at Port Colborne, to steel storage bins, from which it is drawn as required and, under pushbutton control, mixed in a rotating drum in carefully weighed proportions with petroleum coke. An overhead 15-ton crane transports buckets of this mixture to hoppers positioned over small openings in the roof of the anode furnace. From time to time slides underneath the hoppers are pulled and the charge drops into the fiery maw below.

Enough heat is generated during one 8-hour shift by the seven oil burners in an end wall of the

furnace to keep an average house comfortable for a whole winter. As the charge melts under this searing flame, a chemical reaction takes place by which the coke removes the oxygen from the nickel oxide, thus "reducing" the nickel oxide to nickel.

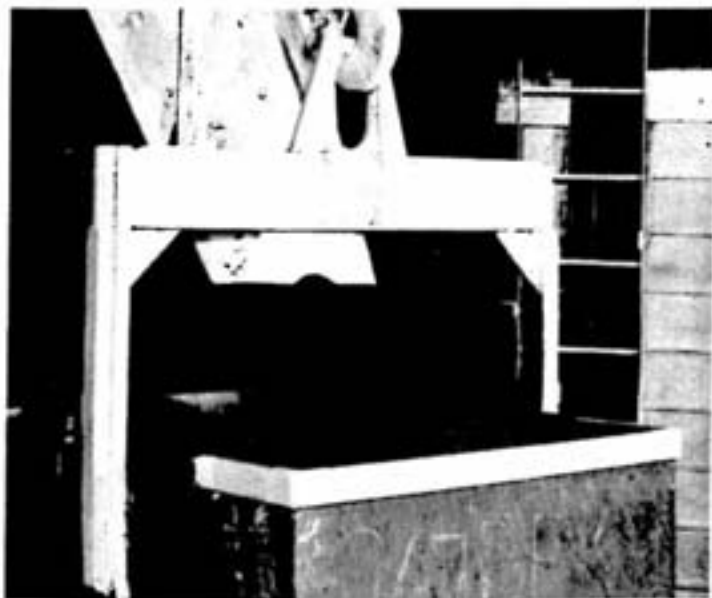
Made of firebrick, the furnace has a floor area of some 700 square feet. There are four furnaces, each with a casting wheel; one furnace is usually on standby.

It takes about 40 hours to melt down all the charge a furnace can hold. Near the end of this period, when most of the charge is molten, a layer of metallic impurities has floated to the surface of the bath; this slag is periodically skimmed off with steel rables into a cast iron slag-pot through a door in a side wall.

200 Flery Tons of Metal

Finally the furnace is ready to tap. It now contains about 200 tons of white-hot molten anode metal, a foot-deep. A man needs colored glasses to see anything at all inside, at the same time protecting his eyes.

(Continued on Page 12)



Feed to the anode furnaces is nickel oxide sinter from Copper Cliff, mixed in weighed proportions with petroleum coke.

Wheelman Alfie Burattini operates compressed-air controls to tilt pouring drum and move casting wheel.



Second-Last Step

(Continued from Page 11)

The furnace crew drills holes through the fireclay buds plugging small openings in one of the side walls, whereupon streams of the brilliant molten metal flow down chutes leading to an oil-fired pouring drum. Most important man in the operation, the furnaceman among his other responsibilities keeps a sharp eye on the tap holes, either enlarging them or trimming them with freshly tempered fireclay to maintain a steady flow of metal at just the right rate.

Meanwhile the wheelman is ready at his pneumatic controls, housed beside the 25-foot diameter rotating casting wheel on which are mounted 28 water-cooled copper moulds shaped like anodes. Every 45 seconds he tilts the pouring drum to fill a mould, his experience and sense of timing telling him just when he has poured a 500-pound anode. He then elevates the drum while he operates the big wheel to move the next mould into position, and repeats the pouring procedure. During its trip on the wheel the anode cools and solidifies; crewmen bolt a bar to its suspension lugs, remove it with an air hoist, and prepare the mould for its next turn at the pouring drum.

Temperature Policed

Throughout the 10-hour casting cycle the metal in the furnace must be maintained at the right temperature—if it becomes too cold it may "freeze", if too hot it may wash out the clay from the tapholes. The gasman takes its temperature regularly with his optical pyrometer, and adjustment of the oil burners is made accordingly.

The hot gases from the anode furnaces first pass through a waste heat boiler where most of the steam required for the nickel refinery is generated; then they're used to preheat combustion air for the oil burners. They are passed through a cyclone dust collector, and finally through an electrostatic precipitator where a 40,000-volt potential between closely spaced wires and plates gives them a jolt that takes out almost all the remaining dust.

Making sulphide anodes, limited by the facilities to about a fifth of the department's production, is a much simpler operation. Nickel sulphides are melted in a small oil-fired furnace at a temperature of 1800 degrees F. and are tapped into ladle cars travelling along two banks of cast iron moulds, which are filled one by one.

Controlled Cooling

As the anodes solidify they are hoisted into insulated boxes, 14 to a box, and left under sealed cover for some 24 hours. It is during this period that the most interesting phase of the procedure takes



Suspension bar bolted to the lugs, a still-hot anode is hoisted from the casting wheel by floorman Joe Zdelar. On the right, weigher John Mikolasek checks out a car of anodes on its way to the final refining process in the electrolytic department.



Molten furnace slag is poured on high-pressure jets of water which granulates it into shot, convenient to handle in further metal recovery treatment. On the right, anode department superintendent Jan Van Dillen (with pencil) confers with assistant to the superintendent Les Way and assistant superintendent Lloyd Schooley on a refractory problem.

place. Under controlled cooling, as are the huge ingots in the matte separation process at Copper Cliff, the anodes have time to develop a strong crystal structure without which they would be too brittle for the upcoming treatment in the electrolytic department. This is the process used in the Thompson nickel refinery.

Superintendent Jan Van Dillen lays strong emphasis on safe workmanship in his anode department. "Like all people working in the refinery, our men wear safety glasses, hard hats, and steel-toed safety shoes. As extra protection against the special hazards of handling molten metal, furnace crews engaged in skimming slag and controlling the flow of metal wear fine-mesh face screens. All men around the tapping furnaces wear leather spats to prevent a splash of metal entering shoes, and those handling anodes and firebrick wear metatarsal guards over their insteps."

Successful operation of the anode department depends upon many skills. But all through this action runs a strong influence of intuition, born of careful training and experience—it might be

called a "feel" for metal—that in some ways sets anode casting apart as an art rather than a precise metallurgical science. In this all the men involved may take justifiable pride.

Sulphide anodes must be slow-cooled in sealed insulated boxes. Operating the gantry crane is Henry Masciovecchio.





Bill Brown, Brian Rogers



Linda Frantilla



Frank MacKinnon



Ann Grace



Don Ley, Don Burke

John Taggart
Gary Cotnam
Vic Spencer

BILL BROWN SKIPS WINNERS IN COPPER REFINERY 'SPIEL

Up until this year he was "often a bridesmaid but never a bride", but last month Bill Brown finally made it to the championship of the annual Copper Refinery curling bonspiel, skipping his rink of Bill Bruins, Bruno Rebellato and George Batten to victory in the main event. Runners-up were Rolly Roy (skip), Wayne Wilson, Mike Stencell, and Gord Shedden.

Another veteran Refinery curler, Wes Hart, master-minded the winning rink of Gabe Prevost, Bob Montgomery and Russ Radford in the second event, and Joe Halverson was the victorious skip in the third, ably supported by Al Zandri, Dominique Chalopin and Joe Vaillancourt.

Three charming young stenos added a lot of interest to the 'spiel, and were appreciated with special prizes. In charge of the always-enjoyable event were Larry Martel, Dunc White, the old master, Wes Hart, and Bud Eles. A round of applause went to Bob Sandberg for his efforts in rounding up a fine array of loot. The turnout of 28 rinks was the second largest in the history of this athletic association classic.



Fred Wilkie has smooth slide delivery

Starving Deer Get Help From Conservationists

The near-record snowfall in the Sudbury area this year came as a mixed blessing. Skiing and snowmobiling enthusiasts were without complaint, but local conservationists were very concerned about the heavy snow's effect on the area deer population.

Although the above-average snow depth made travel difficult for the deer, the real problem was the light crust of ice formed about a foot above ground during mild mid-winter weather. Because they get bogged down in the crusted snow, the deer tend to stay on the open trails in their yards; most of the food within reach was consumed and problems were beginning to mount. Should the animals have had to go completely unaided right through winter, widespread starvation would almost certainly have resulted. Furthermore, weakened by the lack of food and restricted to the use of established trails, the gentle denizens of the woods were easy prey in abnormal numbers for marauding wolves.

Cheerful Volunteers

To help offset this distressing effect of the heavy snowfall, local game and fish clubs have taken

part in a deer-feeding program in co-operation with the Ontario Department of Lands and Forests. Deer yards in the High Falls and Burwash areas were selected as sites for the program by department biologist Ken Morrison. President Armand Belanger's Trailsmen Rod and Gun Club of Val Caron and president Doug Ogston's Copper Cliff Rod and Gun Club participated. Armand is a motorman at Stobie, and Doug, recently voted Ontario Sportsman of the Year, is a maintenance foreman in the Copper Cliff smelter.

Lashing on snowshoes, and using chain saws and axes, the conservationists cut down hardwood trees, chiefly birch and maple and dragged them within a deer's reach on the established trails of the yards. Maple and birch are best because of their large number of edible sprouts. Shortly after cutting sessions at High Falls and Burwash, herds of as many as 30 deer were observed entering the yards to "put on the feed bag".

Many a fawn will owe its life to the cheerful volunteers who undertook this deer mercy mission.



Preparing for their mercy mission here are Copper Cliff Rod and Gun Club members Max Ridd, Percy Morrison, Elmer Laakso, Ron Bertrand, and Buster Powell. The snow was hip-deep in the bush.

A PUNNY PIGEON

A mother pigeon and her baby were preparing for migration to Florida, however, the young one was afraid he would not be able to make it on his own.

"Don't worry," said the mother, "I'll tie a string around my leg

and around your neck, to help you along."

"But," said the young pigeon, "I don't want to be pigeon towed."

— The Transmitter

When a woman says she won't be a minute, she is usually right.

Life and Times Of Sudbury Area Graphically Told

A fascinating photographic flashback of the history of the Sudbury area, decade by decade from 1890 through to the present day, has been published by International Nickel for local Inco employees and interested citizens.

"The Land Above the Ore Below" is the title of the booklet. Pictures of early prospectors, pioneering mining camps and production methods launch the reader on a most informative and often sentimental look at the life and times of the nickel capital of the world. Through it runs a delightful leavening of now-amusing shots—sultry Theda Bara projecting the feminine mystique as of the 1910 era—a quartet of 1920 bathing beauties coyly watching for the birdie to pop out of a cumbersome old Graflex camera.

Historical events of both local and world impact that touched the lives of everybody have been well chosen to round out the cleverly edited pictorial presentation.

Following the course of growth and development in the area, the script for this 80-year review brings into proper perspective a subject much in the minds of most people these days, local environmental control.

Jokes To Be Endured

"Most Sudburians," says the booklet's introduction, "have

learned to accept such slurs on their community as 'The back side of the moon' and 'Pittsburgh without the orchestra' in a spirit of good humour, although not a few proud citizens, pushed beyond their limits of endurance, have been known to 'blow their stacks' when hearing an outsider compare their home to a hinterland.

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

"There is much in the unique qualities of the district to be proud of. It is the most important nickel producing area in the world, and nickel has been one of the most important—if not the most important—metals that have contributed to 20th century progress. The discovery and development of the Sudbury ores has been ranked in importance to Canada to the building of the Canadian Pacific Railway. Had it not been for the faith and dedication of the nickel pioneers, there wouldn't be a Sudbury and its substantial contributions to the nation and the world.

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

Golden Wedding of Copper Cliff Couple

Married on January 10, 1921, Donato and Amalia DiSalle celebrated their 50th wedding anniversary at a house party held in the Copper Cliff home of their daughter, Mrs. Viola Marcolini.

Forty relatives and friends were on hand to congratulate the couple, who were presented with gold wedding bands by their family of five children and 12 grandchildren.

Donato exchanged marriage vows with Amalia Ceroni in Pacentro, Italy, left for Canada in 1924, and was hired by the Mond Nickel Company at Coniston in 1925. He was transferred to the Copper Cliff converter building in 1932. He and his wife have lived in Copper Cliff since she came out from Italy to join him in 1934.

An Inco pensioner since 1960, Donato worked as a smelter baler during most of his long service with the Company.

Still quietly active at 73, Mr. DiSalle maintains his interest in the plant at Copper Cliff through his son Con, a plateworker, and electrician "Tarchie" Tomassini, husband of his daughter Fio.



the last century.

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

Heap Roasting Blight

"Then came the practice of outdoors heap roasting to obtain nickel and copper from the ores, and smoke rich in sulphur dioxide poured over the countryside killing what few trees and other vegetation remained. In fact, the gas has a troublesome preservative quality that is evident in the thousands of dead tree stumps that still litter the district.

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

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

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

Students and others wishing to obtain copies of "The Land Above the Ore Below"—a sure-fire "best seller"—should write to Inco's public affairs department at Copper Cliff.

Receive Sudbury "Outstanding Citizen" Awards



Sudbury Star

An "outstanding citizen" award was presented to Ken Fyall at the annual Sudbury Brotherhood Week dinner in recognition of his community service as campaign chairman for the past five years of the Sudbury Cancer Society, and, among other activities, enthusiastic worker in the annual Santa Claus parade and the Canadiana celebration. The presentation was made by Uiril Oke (left), vice-president of the Mayor's Committee on Human Rights.

Ken transferred from the Inco transportation department to the public affairs department at Copper Cliff about a year ago.

Also honored was Sister Marie Dubord for her work as founder of Sudbury's Half-Way House; she received her plaque from Robert Recollet (right), a crusherman at Copper Cliff North mine, who is president of the Nickel Belt Indian Club and a member of the Mayor's committee.

Picks Off \$320 Suggestion Plan Award

Roy Carlyle, 2nd class mechanic at Copper Cliff smelter, got right down to the nuts and bolts of a problem and came up with an idea that won him a \$320 Employees Suggestion Plan award. He is shown (left) being congratulated by section maintenance superintendent Tom Prior (right) and converter building area foreman Harris Moore.

Roy's suggestion was to use larger diameter bolts on the converter uptakes to prolong their life. But he says he won't have to put on his thinking cap to figure out how to get rid of the \$320—he'll just hand it over to his wife Elaine.

In the past three months over \$1,800 has been awarded for suggestions to improve smelter operations, more than half of it for ideas related to the converter department.





Goal-bound, Levack's speedy little Jocelyn Albert, 12, breaks away.

Ringette Proving Popular Sport for Teen-Age Lassies

Ringette, Canada's latest and fastest growing girls' team sport, is getting an enthusiastic response in Levack. Thirty girls, ranging in age from 12 to 15 years, are playing on two teams coached by Ernie Taylor and Gary Chaters. They play exhibition games against teams from Dowling, Azilda, Chelmsford and Sudbury. Last year, although it was the Levack girls' first whirl at ringette, they placed second in a tournament held at Azilda.

Started in North Bay

Ringette was originated in 1964 by Sam Jacks, commissioner of parks and recreation for the city of North Bay. The game is played on ice and teams consist of two forwards, two on defence, a centre and a goaltender. The broomsticks, or bladeless hockey sticks, are colored according to the players' assigned positions on the ice. The goalkeeper wields a pink stick. A standard rubber deck-tennis ring—from which comes the name of the game—replaces the hockey puck. Body-

checks (and biting in the clinches) are not allowed.

Although it's only six years since ringette was invented, the game has seen a lot of growth. Sudbury, for instance, has 800 girls playing. Interest is picking up fast in the northern United States as well as in Europe, where it was introduced by Canadian Armed Forces personnel formerly stationed at North Bay.

Easy to Get Going

Lots of fun, the game uses existing ice hockey facilities, and requires only a pair of skates, a broomstick, and protective head gear approved by the Ontario Ringette Association. The inclusion of ringette in municipal recreational programs brings about a better balance between boys' and girls' winter athletic activities.

The man responsible for bringing ringette to Levack was planned maintenance clerk Ron Corelli, with an assist going to Harvey Nadeau.

The Town of Levack recreation committee provides the girls' ice time at the arena, and their team jerseys were bought by the Levack Mine Athletic Association. Next year, there will be an organized league with entries expected from all communities between Levack and Sudbury, and possibly farther afield.

Port Colborne Staged Fine Winter Carnival

Lovely 15-year-old Diane Bendes, daughter of Zoltan Bendes of the nickel refinery accounting staff, was crowned queen from among 18 pretty candidates from the high school, at Port Colborne's annual three-day winter carnival. Her princesses were Jane Van Viegan, 18, and Donna Taylor, 16.



Queen Diane

Motorcycle, snowmobile, dune buggy and skating races, helicopter, snowmobile and hay rides, and a host of other attractions kept a crowd of 3500 entertained on the final day of the big event, February 7.

A rocket firing demonstration by the Port Colborne Rocketry Club, and a spectacular parachute jumping exhibition by members of the Niagara Parachute Club, Burnaby, were special thrills.

Staged on Gravelly Bay, from which the city got its original name, the program was organized by city recreation director Art Stead and Wesley Price of the Inco research stations. Wes was kept exceptionally busy doubling as Porty the Penguin, mascot of the carnival.

Appointments

The following appointments have recently been announced:

COPPER CLIFF

G. H. Merriam, manager, mines exploration;

Grant Bertram, mine superintendent, Copper Cliff North mine; William J. Moffat, mine superintendent, Levack mine;

Stanley Dobson, pit superintendent, Clarabelle open pits No. 1 and No. 2;

A. J. Bentley, assistant mine geologist, Kirkwood mine;

N. Fortina, assistant mine geologist, Copper Cliff South mine;

R. D. Martindale, assistant mine geologist, Murray mine;

A. A. Ryter, assistant chief mines engineer (planning);

G. W. Johnston, area engineer, Frood-Stobie mines;

C. Barsotti, mine engineer, Copper Cliff North mine;

J. G. Rickaby, superintendent of safety (mines);

W. C. Buchanan, superintendent of safety (processing);

M. A. Luck, assistant manager, copper refinery;

E. H. Bracken, assistant to the manager, iron ore recovery plant;

G. C. Nowlan, superintendent, iron ore recovery plant;

A. D. Hansen, pellet superintendent, iron ore recovery plant;

B. J. McQueen, pellet superintendent, iron ore recovery plant;

D. R. Morrison, superintendent, process technology, iron ore recovery plant;

W. A. Hudgins, superintendent, pressure carbonyl department, Copper Cliff nickel refinery;

S. F. Pinkos, superintendent, converter department, Copper Cliff nickel refinery;

W. D. Schoenefeld, superin-

tendent, maintenance department, Copper Cliff nickel refinery;

D. Wilkinson, superintendent, process technology department, Copper Cliff nickel refinery;

J. G. Paterson, superintendent (development), Copper Cliff process technology;

J. Matousek, supervisor, pyrometallurgy development, Copper Cliff process technology;

F. S. Homer, supervisor of benefits, staff and hourly employees.

PORT COLBORNE

W. T. Grefton, superintendent, industrial relations and personnel, Port Colborne nickel refinery;

Charles T. Burke, assistant superintendent, electrolytic nickel department, Port Colborne nickel refinery;

Herbert W. Haun, assistant superintendent, shearing, shipping and yard department, Port Colborne nickel refinery;

J. A. Rossi, safety supervisor, Port Colborne nickel refinery.

TORONTO

L. Guglielmin, manager, process development;

J. H. Walter, senior industrial relations adviser, transferring from Port Colborne nickel refinery, where he was assistant manager.

A. A. Wiebe, superintendent, assay stations operated by the exploration department in Australia, Indonesia, New Caledonia, British Solomon Islands Protectorate, and Canada; he will continue to be located in Sydney, Australia.

President of MAC

F. Foster Todd, who retired as executive vice-president of International Nickel on February 28 but will continue in a consultant capacity with the Company, was elected president of the Mining Association of Canada at its annual meeting in Toronto on February 24.

He succeeded John Kostuik, president of Denison Mines, Elliot Lake.

No Way He Was Going to Call This Play Back

Well-known secondary school and minor hockey referee, Levack's Bill Hannan blew no offside whistle when assistant manager of mines Charles Hews presented him with a \$760 Suggestion Plan award. "The pass looked pretty good to me," he said. A 1st class instrument man, Bill figured that installation of a vent on the downstream side of the red jacket valve under the sand plant tanks would reduce the consumption of valve liners and provide a smoother flow of sandfill. And that's just what happened when his idea was put on trial. Here he's pointing out the details to Mr. Hews and Levack area superintendent Dave Lennie. Bill and Sandra Hannan are planning a trip to Florida in May with their son David. "Now I won't have to take my whistle along when the wife goes shopping," he smiled as he pocketed the cheque.



Goalie Sylvia Hallett's stick is colored regulation hot pink.

Retired on Inco Pension

WITH 20 OR MORE YEARS OF SERVICE

FRANK SILC

When Murray driller Frank Silc came to Canada in 1929 from northern Yugoslavia, he was supposed to go straight out west to work as a farm laborer; but farming didn't appeal too much



Mr. and Mrs. Silc

to Frank so he jumped off the train in North Bay and headed for Sudbury.

Frank started with the Company at Levack in 1929 but transferred later to Frood and Garson, and in 1941 went to Murray where he remained for the rest of his service.

In 1939 he married a Powassan girl, Minnie Thompson in Sudbury. They have four children and one grandchild. Although he is on a disability pension with a bad back, Frank and his wife would like to repeat the European trip they took six years ago on their 25th anniversary. Their permanent home is likely to be Sudbury.

BILL ROBINSON

When Bill Robinson and his family moved recently from Lively to Kelowna, British Columbia, they left quite a gap behind them. Both Bill and his



Mr. and Mrs. Robinson

wife were active in Lively's community affairs, particularly in their church's youth groups.

Bill was born in Cooksville, Ontario, and although he started with the Company in 1939 at Frood mine, the last 19 years of his service were spent in the Creighton mill where he was a 1st-class mechanic.

Bertha Millar from South Porcupine, near Timmins, became his wife in 1948 in Toronto. They have two children. On a disability pension after a bout of heart surgery in 1969, Bill sums up his retirement program as "enjoying the western hospitality and taking life easy."

LOUIS COGNIGNI

Louis Cognigni first came to Canada from Italy in 1928 and worked as a freight handler at



Mr. and Mrs. Cognigni

Depot Harbour, Parry Sound. He returned to Italy for Christmas in 1938 and met Frances Cerquozzi, whom he married in Assisi the following March. The newlyweds sailed to Canada a few days later.

Louis returned to Depot Harbour and remained there until it was closed in 1942. He then came to Inco at Port Colborne in September of that year, starting in the leaching department, and was a plant fitter at the time of his recent early service retirement. He and his wife took a two-month trip to the Continent (France, Switzerland and Italy) to celebrate his retirement.

Hunting, fishing and vegetable and flower gardening will now be his full-time job—and he's not complaining one bit at the prospect.

ORVAL DUNSMORE

Any future fishing or hunting done by Orval Dunsmore will be done in comfort. He converted a 30-passenger bus into a camper this past summer, and it has already proved its worth.



O. Dunsmore

An early service pensioner, Orval started with Inco in 1926. His father, the late George Dunsmore, worked for the Company during an even earlier period, driving a team at the old O'Donnell roast yard west of Creighton. Orval was born in the Town of Mond but moved to Crean Hill as an infant. His 44-year association with the Company started at Creighton but he transferred to the electrical department at Frood a year later and stayed there for 30 years. He also saw service at High Falls and later the iron ore plant.

In 1935 he was married in Sudbury to Adeline McNab. They have three children and nine grandchildren. Orval is feeling "pretty near A-1" and wants to renovate his Sudbury home—in between fishing and hunting trips in his classy big camper.

JOE MAROIS

An Inco employee since 1930 and now an early service pensioner, Joe Marois started his nearly 40-year Company career in the stopes at Frood, moved over to the open pit as a churn driller in 1944, and was a pit miner at Clarabelle from 1961 to 1968. For the two years just prior to his retirement Joe worked as a dryman at the North mine.

A native of Creighton, Joe married a Noelville girl, Bertha Ber-



Mr. and Mrs. Marois

geron, in 1935. They are parents of five and grandparents to eight.

With a 100-foot double driveway at his home on Notre Dame Avenue, Sudbury, Joe is very grateful to his friends and associates who presented him with a snowblower during a party held in his honor at the Sorrento Hotel. "As you may guess," he said, "it's been on the go pretty steadily during the last little while." He was also presented with a purse by the more than 400 well-wishers who attended the send-off.

"ARMY" ARMSTRONG

Elwood, better known as "Army" Armstrong, transferred from an underground job to become a plant security officer at Levack in 1939; he had started with the



Mr. and Mrs. Armstrong

Company in 1937. He had previously taught school for seven years. "Army" was born at Hannah, North Dakota, but moved as an infant to the Yorkton, Saskatchewan area. He stayed at Levack until 1953 when he moved over to the Frood-Stobie complex, remaining in police and security work until his retirement.

In 1934 "Army" married Marion Perry in Pelly, Saskatchewan. Mrs. Armstrong died in 1954, leaving three children. In 1967 he was married in Timmins

to Mrs. Mary Prentice, who had four children and 11 grandchildren.

Living in Trenton, Ontario, and enjoying perfect health on his full service pension, "Army" likes coin collecting, fishing and watching baseball.

ADOLPHE PARADIS

When Dolph Paradis and his wife Rita came in for their Triangle retirement picture ap-



Mr. and Mrs. Paradis

pointment, their bags were all but packed for a six-week holiday in Florida—"I'm just a little tired of all this snow," moaned Dolph.

A welder leader since 1945, he started with Inco in 1929 at Coniston after working for a year with the CPR. In 1932, he transferred to the copper refinery, and moved again in 1941 to the Frood open pit for the remainder of his service.

Three children and three grandchildren are the result of his marriage in 1934 to Rita Benoit. Son Cleo is a 2nd class maintenance mechanic at Frood. Mrs. Paradis is the daughter of the late Harvey Benoit, who worked for the Company for 35 years at the Coniston smelter.

Enjoying good health as he eases into early service retirement, Dolph plans to spend more time at his French River cottage; he also likes snowmobiling, fishing and hunting, and flower gardening. Although the winters may find Dolph and his wife in a warmer climate, they plan to maintain their home in Sudbury.

VERNON LEE

"I haven't any definite plans; we'll just take it as it comes. I'm in good health and hope to keep on enjoying life for a long time," Vernon Lee said goodbye to his many friends at the nickel refinery in Port Colborne on his service retirement.

Vern was born in nearby Sherston in 1906. His black-



Mr. and Mrs. Lee

smith father later relocated his shop at Bethel. Vern worked with his dad before going into the garage business in Port Colborne with his brother. He then became employed at the nickel

plant in 1936 in the mechanical department, where he became a 1st class machinist in 1942.

Mr. and Mrs. Lee (the former Alexis Chisholm) were married in 1938 in Port Colborne. They have two daughters and two grandchildren. Vern enjoys gardening and putting around with cars. He does all of his own repairs. The Lees are looking forward to a trip down east to Mrs. Lee's part of the country this Spring.

JOSEPH MASON

After 37 years with the Company, Joe Mason is taking an early service pension. All his Inco years were spent at the copper refinery, where he was a shift fore-



Mr. and Mrs. Mason

man in the silver building. Born at Quebec City, he grew up in Sudbury and worked on government surveying parties in the Sudbury area before joining the Company in 1933.

Married in 1936 to Irene Langlois, Joe is the father of six children and eight grandchildren. Mrs. Mason was born in Manistique, Michigan, but also grew up in Sudbury.

For recreation, Joe will take more advantage of his 18-acre summer place in Verner, which is "just a skip and a jump" from the golf course at Sturgeon Falls. With a successful arterial operation behind him, he is feeling in good health. The Masons will maintain their permanent residence in Sudbury.

DONALD RANDALL

After 42 years with the Company Don Randall, head boxman in the electrolytic department at Port Colborne has elected early service retirement.

Born at Shisler's Point, in the locale now known as Sherston,



Mr. and Mrs. Randall

Don had done a short stint on the digging of the new Welland Canal before becoming an Incoite in 1928.

He worked in various departments before settling permanently in the electrolytic department in 1939. He received the Metallurgical Institute Medal for bravery along with six other employees in

1937 while employed in No. 2 building.

Don spent over three years in army service in England and Italy.

He was married to Dorothy Purcifer in 1929 at Port Colborne. The Randalls have seven children and four grandchildren. One son, Fred, is employed in the electrolytic department, and daughter Beverley is the wife of Gord Hurst, supervisor, data processing.

Don enjoys tinkering around with cars, as well as fishing. The Randalls expect to continue residing in Crystal Beach. They are looking forward to visiting a son in British Columbia.

TOM BUCHANAN

"Don't look for me this spring — I'm going to be in Nova Scotia for the lobster season." Tom Buchanan will celebrate his retirement with a visit to his old home in New Waterford, on Cape Breton Island.

Tom worked eight years in the coal mines around New Waterford before coming to Inco in



Mr. and Mrs. Buchanan

1948 at the Copper Cliff smelter. He transferred to the planned maintenance department at the iron ore plant in 1966.

Married to Leona Edwardson in New Waterford in 1948, Tom is the father of four children, and a grandfather twice over. Daughter Brenda is married to Copper Cliff North mine driller Vic Marcoux. Mrs. Buchanan was born in Sault Ste. Marie.

On a disability pension with a heart condition, Tom is keeping moderately busy doing committee work for the Lockerby Legion building program. The Buchanans will remain Sudbury residents.

WALTER COLIS

If Phoenix, Arizona ever needs a glowing endorsement for its publicity handouts, it might well contact retiring Garson divisional foreman Walter Colis. Walter has been there 16 times, and plans



Mr. and Mrs. Colis

to spend future winter months in that city's kindly climate.

Born at Renfrew, Walter came to Inco in 1930 after five years of



On his last shift, Frank Hawkins was presented with a cheque from his Copper Cliff substation workmates. In the back row; left to right, are John Kozak, Roy Maud, utilities superintendent Jim Wharton making the presentation to Frank, Tracy Hobden, and Charles Dampier, assistant utilities superintendent. Kneeling from left to right are Len Kutschke, Norm Lyons, Stan Dorling and Art Richardson.

FRANK HAWKINS

Frank Hawkins who started with Inco in 1937 at the Copper Cliff mill, had worked for the Company during two previous winters when he wasn't needed



Mrs. Hawkins

as engineer on his father's fishing tugboat based at Blind River. In 1953, he transferred to the No. 1 substation for the remainder of his service, working on the compressors as a third class station-

ary engineer.

Married in 1945 to Evelyn Zinkie, Frank is the father of Harry Hawkins, a computer operator in the data processing department at Copper Cliff. Mrs. Hawkins is the daughter of the late William Zinkie, who retired from the Company in 1942 with over 49 years service.

Enjoying good health on his special early service pension, Frank likes to read and walk, and is considering a motor trip to Vancouver this summer. The Hawkins will remain in Copper Cliff. Frank wound up his interview with the Triangle by saying, "My association with the Company has always been a pleasant one."

ARVI MAENPAA

A tool fitter for the last 17 of the 40 years that he worked at Inco, Arvi Maenpaa has retired on service pension.

A Frood miner since he joined the Company for the first time in 1927, Arvi broke his service in 1929, and will be remembered by some of Sudbury's old-timers as the genial proprietor of the New Ontario Hotel pool room on Elgin Street. He quit the establishment in 1931 and returned to Frood to stay.

(Continued on Page 18)

Retired on Inco Pension

WITH 20 OR MORE YEARS OF SERVICE

(Continued from Page 17)

Born in Kauhajoki, Finland, and a single man when he came to Sudbury in 1927, Arvi ate most of his meals at Latila's restaurant (since demolished) on Lisgar Street. He liked the food there



Mr. and Mrs. Manegay

so well that he courted the cook — Helmi Ranta — popped the question, and they were married in 1930. One of their family of two, son Wilhard is a drift driller at Crean Hill. They have five grandchildren.

A regular visitor to Wilhard's farm at Worthington, Arvi enjoys firing-up and using his son's sauna. "Cutting the wood out in the fresh air — that's just the exercise I need now that I'm not working for a living," said Arvi, who intends to remain in excellent health for a long time to come.

RENE LACASSE

A picture of Rene Lacasse should be familiar to most Frood miners — Rene was a dryman at



Mr. and Mrs. Lacasse

Frood for 21 years, after working underground for eight years.

Born at Rockland, near Ottawa, he worked in sawmills and in the bush in the Blind River area before coming to Inco in 1942.

Married to Cecile Ouellette on Christmas Day in 1945, Rene is the father of three children; Mrs. Lacasse was born in Bonfield near North Bay. Rene's pastimes include gardening and keeping tabs of his pigeons at his New Sudbury home. Taking a full service pension, he is enjoying good health.

GEORGE GIFFORD

Geological department sampler George Gifford is retiring on an early service pension with close to 32 years service. He came to Canada from his birthplace of Devonshire, England, as a boy of three.

His father, the late Fred Gifford, was at the controls of the



Mr. and Mrs. Gifford

first streetcar running from Sudbury to Copper Cliff beginning in 1915, on which the fare was five cents; the old trolley line went out of service in 1950. George farmed with his dad on land now partly occupied by the Cassio Motor Hotel.

Married in 1930 to Bertha Croteau of Copper Cliff, George is the patriarch of a large family — 13 children and 19 grandchildren. Sons Bob and Harold are Inco men, working at Clarabelle open pit and Creighton mines respectively, and three of their daughters are married to Incoites. Frances to Copper Cliff smelter bricklayer Andy Pringle, Eileen to Bill King of the Copper Cliff mill and Jean to Tom Zuliani of the transportation department. The Giffords plan to stay in Sudbury.

ROMEO LAFLEUR

Born in Mattawaki, Quebec, Romeo Lafleur grew up in Sturgeon Falls where he learned the carpentry trade from his father. He joined Inco in the shops at Copper Cliff in 1946 after working on plant construction at Leveck, Port Colborne and Copper Cliff.

Married at Sudbury to Annette Renaud in 1940, Romeo is the father of one daughter and has



Mr. and Mrs. Lafleur

two grandchildren. On a disability pension, Romeo spends much of his time reading mechanical periodicals — "anything with a blue print in it." Mrs. Lafleur, who also came from Quebec, is a skilled dressmaker.

The Lafleures plan to stay in Sudbury; they are planning a visit with their daughter in Indiana this summer.

ARMAND BELLEFEUILLE

Armand Bellefeuille was born at Badgerow in the Sturgeon Falls area but grew up in Parry Sound. Starting with the Company in 1948 at Coniston he transferred



Mr. and Mrs. Bellefeuille

to the Copper Cliff smelter in 1950, and then to the iron ore plant in 1957 for the remainder of his service. He was a maintenance mechanic in the recovery department.

Armand married a Sturgeon Falls girl, Blanche Armitage, in 1946. One of their seven children, Alan, is a machinist apprentice at Frood. Three grandchildren complete the Bellefeuille family at present. Armand has taken a disability pension following lung surgery last year. Although he has to slow down the pace, Armand likes to get out on his new six-wheeled land-and-water vehicle, and is looking forward to full time summers at his Nepawassi Lake cottage. The Bellefeuilles will continue to make their home in Sudbury.

ALFRED RIVARD

The Triangle had to photograph Fred Rivard and his wife, Stella, early in the day — they didn't want to cut into the time allotted



Mr. and Mrs. Rivard

to one of their frequent card-playing sessions at the Coniston senior citizens' club. They also enjoy reading and the occasional visit with a daughter living in Saskatoon. Fred was born in St. Charles but grew up in Coniston and Sudbury. He started with the Company in 1923 at Coniston smelter, left in 1929 for a brief fling in the construction industry, and returned to Inco at Coniston, where he was a locomotive engineer for 27 years of his service.

Stella Kirwan, from Ville Marie, Quebec, was married to Fred in Markstay in 1930. They have four children and 13 grandchildren. Both Mr. and Mrs. Rivard are in good health and enjoy bowling regularly. They will continue to reside in Coniston.

KEN MADILL

After farming in Manitoba and working on elevator construction in Saskatchewan, Ken Madill came east in 1933 and started that year with the Company in the Copper Cliff smelter. He was a skimmer on the converters until 1947, then spent 23 years in the winding shop.

Both Ken and his wife, the

former Elsie Snowden, whom he married in 1939, came from Alton, Manitoba. They have two children and one grandchild.

Ken is enjoying good health on his full service pension and



Mr. and Mrs. Madill

will keep busy with renovations and gardening at his Copper Cliff home. In summer, look for this happy couple at the cottage they have enjoyed since 1958 on Trout Lake, near Alban.

JOHN JAMIESON

When John Jamieson transferred from Creighton to the Clarabelle open pit in 1968, his son John, Jr. carried on in his footsteps as a shift boss at Creighton No. 3 mine.

He was born at Alliston, Ontario, and started with Inco in 1939 after driving truck and



Mr. and Mrs. Jamieson

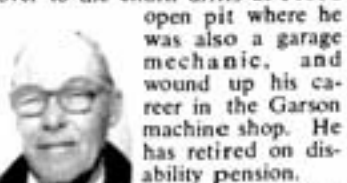
operating a garage in Sudbury for three years. He was a shift boss from 1951 until his retirement.

In 1942, he married Kathleen Riley in her home town of Bristol, Quebec, and they have three children and two grandchildren.

John enjoys gardening, television and playing cards. He is taking a disability pension after a heart bump in the summer of 1970. The Jamiesons will make their home in Pembroke.

GERALD MCBRIDE

During some 30 years with Inco, Gerry McBride first worked underground at Garson, moved over to the churn drills at Frood



Gerald McBride

open pit where he was also a garage mechanic, and wound up his career in the Garson machine shop. He has retired on disability pension. During five years of army service he suffered a leg wound overseas, which still gives him trouble, "but I guess I was fairly lucky just the same". A bachelor who spent most of his life in Sudbury, he is now making his home with his married sister in Hamilton, and his favorite recreation is "trying to beat the horses".

New Trophies and Zones In First Aid Competitions

Four new trophies will be up for grabs when the 1971 Inco inter-plant first aid competitions reach the quarter-final stage early in April.

Mines and plants have been grouped geographically to streamline organization of the contest as new operations in the Company's expansion program swing into production. "This move will prevent unwieldy numbers of teams qualifying for the semi-final events, which otherwise would have been inevitable," said safety superintendent M. C. Kossatz.

The West Mines group, which includes Levack, Creighton, and Crean Hill, will send their winning teams into a quarter-final for the new C. F. Hews Trophy on April 5. This group will be joined later by Coleman and Totten.

In the East Mines group, with the new T. D. Parris Trophy at stake, winning teams from Garson-Kirkwood, Frood-Stobie, and Murray-Copper Cliff North-Clabelle, will compete in their quarter-final April 12. Included in this group later will be Little Stobie and Copper Cliff South.

Iron Ore Plant and Copper Refinery will match splints and bandages in the West Reduction group on April 8 for the new B. Debney Trophy. A future competitor in this group will be Copper Cliff Nickel Refinery.

The East Reduction group, composed of Copper Cliff Plant, Coniston Plant, and Port Colborne Nickel Refinery, will hold its quarter-final on April 15, competing for the new T. M. Crowther Trophy.

Honored by the naming of the four new trophies are Tom Parris and Charles Hews, assistant managers of mines for the Ontario division, and Tom Crowther and Bert Debney, long-time leaders in

developing the Inco first aid competitions into classics of their kind in Canadian industry.

Winners of the Hews and Parris trophies will tangle on April 19 for the H. J. Mutz Trophy, emblematic of the all-mines championship, and victors in the Crowther and Debney events will battle it out on April 29 in the other semi-final, with the D. Finlayson Trophy and the reduction plants championship going to the top team.

Then on April 29 the grand finale takes the spotlight when the mines and reduction champs will match wits and skill for the venerable R. D. Parker Trophy and the first aid crown of the Ontario division.

All seven competitions will be staged at the Inco Club, Sudbury. The Parker event will get underway at 7:30 p.m., the others at 7:15 p.m.

Now They're Talking Stadium Roofs Made of Nickel Stainless Balloons

"Soon tests will begin on a bright idea for roofing stadiums with stainless steel balloons. And nickel's helping to make it happen."

So read a headline in a recent International Nickel advertisement appearing in leading magazines and other periodicals.

Caption for a closeup action shot of a football game is "Grown men shouldn't have to play in the mud".

As imaginative as the revolutionary concept it discusses, the Inco ad goes on to say:

"It sounds like something out of Jules Verne. Actually, it's fresh out of our advanced design studies."

"A gigantic, inflatable metal lid



ring to Levack in 1937. He retired on Company pension in 1953, with 27 years' service.

The Leinos have their own home in Levack, where they tend a very good garden in spite of their respective 83 and 75 years. George likes fishing the year 'round, and taking a weekly steam bath at the cottage he has had on Windy Lake for 30 years. Mrs. Leino likes to knit and crochet. They have a son Nillo, a motorman on 1700 level at Levack mine, three grandchildren, and two great-grandchildren. Enjoying excellent health, they plan to remain in Levack.

February 14 was no ordinary Valentine's Day this year for Mr. and Mrs. George Leino of Levack — it was their 50th wedding anniversary. George (his given name is Yrjo) and his wife Aili were both born in Finland, she in Sainajoki and he in Forssa. They met while working in a dairy in Forssa, and were married in 1921, five years before coming to Canada. George started work with the Company at Garson, transferring to Levack in 1937. He retired on Company pension in 1953, with 27 years' service.

that can be stretched across a football stadium without any pillars or posts of any kind.

"The idea is so mind-boggling that most people have a hard time visualizing it."

Like a Hollow Pie

"Think of a pie that's hollow inside, with the bottom and the top made of a metal skin only 1/16th of an inch thick. When the air is pumped into the pie, the whole thing gets so rigid it can be jacked up into place over the field and never even flutter during a windstorm."

"The weather stays outside, the players don't slide around on their backsides, and the spectators don't drown. Somehow, the whole thing seems a little more civilized than a public mud bath."

"And the cost could be as little as 1/3 of a conventional trussed roof."

"The metal is nickel stainless steel. The nickel is there to make the skin easier to work, and to give it the necessary toughness and strength. Plus corrosion resistance."

"It's a fascinating idea, this revolutionary roof of ours, and scale models are about to be thoroughly tested."

"But the point of the story is this. Just as our metal is a helper, one that makes other metals stronger, or easier to work with, or longer lasting, so International Nickel is a helper."

"We assist dozens of different industries all over the world in the use of metals. We offer technical information. And the benefit of our experience. Often, Inco metallurgists are able to

anticipate alloys that will be needed in the future, and to set about creating them. Sometimes, we come up with whole new concepts — like a stainless steel balloon for a stadium roof."

"This kind of genuine helpfulness, we figure, will encourage our customers to keep coming back to us."

"And that helps all around."

"What a Winter!" Groaned Citizens

A thunder and lightning storm in the middle of a howling blizzard?

That apparently was the phenomenon taking place on Sunday morning, March 7, especially at Copper Cliff, but the disgruntled burghers, already sorely tried by plugged and re-plugged driveways and one storm after another, could be pardoned for shrugging it off with "What a winter!"

The weatherman at the Sudbury Airport wasn't buying that story, though. He called the "thunder and lightning" very unlikely. "We just haven't the right conditions for it," he told the Triangle. "I think the flashes are caused by arcing hydro lines, swinging and contacting in the 45-mph winds, and the rumbling is from the rapid expansion of air by the heat of the arcing, just as lightning produces thunder."

One consolation, the temperature was a moderate 17 degrees above.

District snowfall up to 7:00 o'clock on the morning of the 8th was 94.6 inches, far short of the record 121.4 inches in 1950-51, but well above the average of 78 inches — and it obviously wasn't over yet. Spring seemed a long way off.



Training for their debut in the annual first aid competitions, a Kirkwood mine team of captain Eldon Carmichael (kneeling right), Dan Gaudette, Ken Spencer, and Dan St. Germain (removing ladder) go through their paces under the eagle eyes of safety supervisor Percy Pilatzke and first aid man Andy Luyten. The practice victim was the fifth team member, Sylvio Legault.

Concrete Hull and Deck on Winston Bushnell's Ketch

There's nothing novel about boat-building projects in the Sudbury area—many a home-built craft is being pushed to completion in district garages and basements for the coming season. But Levack mill maintenance mechanic Winston Bushnell, an Inco man since 1959, is building no ordinary run-of-the-waterways boat. In a shed beside his home at Dowling he's about midway to completion of a 32-foot two-masted ketch, with hull and deck of steel-reinforced concrete, or ferro-concrete as it is called.

As in most fields, you have to walk before you run in boat-building. Winston had built "about" eight boats before tackling his current big project, starting with a punt he and some other Levack kids made when he was 8. He recently completed a 24-foot sloop which he sold at Port Credit. A lot of his savvy was picked up from his father, Bill Bushnell, an electrician at Levack mine and a boat-builder of long experience.

Many Advantages

Although unusual for a "do-it-yourselfer", the use of concrete for boat hulls dates back to Holland before the turn of the century. On the professional scene Canada is the current world leader, with 12 manufacturers turning them out.

"Concrete has a lot of things going for it in building a boat like this," Winston said. "It costs about a quarter as much as wood or steel, is fast to work with, requires a minimum of maintenance, and its great strength saves cabin space usually occupied by reinforcing members. Most people are surprised that this boat, which will weight about 7 tons including

2 tons of ballast, will actually be no heavier than if it were built of wood—and it will take a lot less damage in a collision."

Winston's ketch is a three-year project; he plans to launch her in the spring of '72. Total cost will be approximately \$7,000, plus his work of course. Boats of similar size and no better finish or appointments sell on the market for about \$27,000.

A sailing vessel of the size Winston is building becomes a miniature geography lesson: British Columbia supplied the Sitka spruce for the two masts and yellow cedar for the cabin interior, Nova Scotia the dacron sails, Ontario the cement and steel reinforcing rods, Sweden the diesel inboard auxiliary engine, Japan the gas-driven electric power plant, and England most of the rigging. The teak trim comes from Burma, cabin mahogany from Honduras, and original design from the United States. Nickel in the stainless steel for the standard rigging perhaps came from Levack mine. But workmanship is 100% Canadian for sure.

Improved the Design

By removing the boat's steering mechanism from the cabin and by stepping the masts on the deck instead of on the keel, Winston greatly increased living space on board. Complete with radio, toilet, refrigerator and stainless steel sink, the craft will comfortably accommodate four adults on long cruises. His wife Carolynne, as interior decorator, added a quaint touch with a little 4 x 3-foot Cape Cod coal stove, with oven. It will be a true home afloat.



Checking the fit before installing the tie-down on the bow.

Building a concrete hull takes a lot of doing. As Winston describes the procedure, the overturned wooden form was first covered with four layers of standard chicken wire, followed by 1/4-inch high tensile steel rods spaced 2 inches apart, and then another three layers of chicken wire. The tricky job of pouring the concrete then began. "Placing" might be a better word, for to ensure that the concrete gets through the chicken wire maze to the wooden form, every square inch of concrete has to be pounded by hand.

No Coffee Breaks

There's no time for coffee breaks—once the pour begins it has to be completed without interruption, or weak points will result in the 8-inch hull. Winston and six of his friends worked steadily for six hours to complete concreting and moulding of the "wine glass" shape. After three weeks of curing under water-soaked burlap, the 2-ton hull with its smoothly moulded keel was turned upright, using come-alongs, and a special epoxy finish applied.

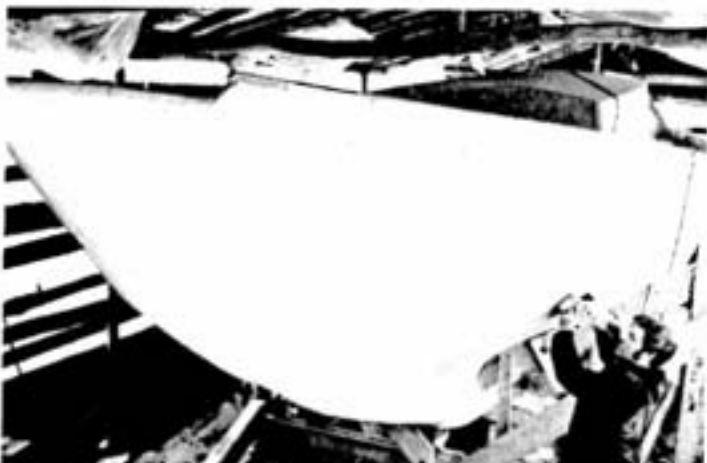
The graceful, slender craft, 9 feet 6 inches across the beam, will have a cruising speed of about 8 miles per hour under her

500 square feet of working sail, 6 with the auxiliary engine.

She'll represent at least 3,000 hours of Winston's spare time, but with him boat-building is more than a hobby—it's practically a love affair.



Making the two Sitka spruce masts, 37 and 25 feet long.



Sanding the hull so she'll slide smoothly through the water.