



Many Joining Marksmen Club

Copper Cliff Marksmen is the name of a newly organized rifle club which already has a membership of about 30 and is making full use of a range laid out in the territory back of Ontario Refinery. Affiliated with the Dominion Marksmen Association, the club will hold competitions for prizes put up from its own coffers and also for the bronze, silver and gold medals supplied by the association.

In the initial local competition, held September 16, Kel Sproule won first prize for .22's, scoring a possible 50. In second place were Tom Gladstone and F. T. St. Michael with 48 each. Bert Wainman, one of the enthusiasts responsible for organization of the club, led the group competing with high-powered rifles with a 48 out of 50; second was Fred Wainman with a 39.

Several members of the club have already won Dominion Association medals with the .22, and Bert Wainman also holds bronze, silver and gold medals with the high-powered rifle.

It looks like bad medicine for the old bulls-eye in this photograph, as L. McNeil, **1** C. Moulton, B. Wainman and M. Track squint along the barrels of their rifles. Standing at the back is Herbert Wainman, the youngest member of the club.

These three members of the INCO police force are all crack shots and moving spirits **2** among the Marksmen. Checking over a target ("it's a 9; no, it's an 8; no, it's a 9") are Fred Wainman, Adam Watson and Andy Guthrie.

A little hammer trouble was the reason for this huddle, and Angus McNeil is getting some free expert advice from the right while Francis St. Michael holds a listening brief beside him. Members of the club supply their own guns and many display trick sights and other equipment which they have fashioned themselves. **3**

Swimming Class Prizes Distributed

The annual swimming meet was held at the Copper Cliff Club with about 100 mothers and fathers present. At the beginning of the meet E. A. Collins presented Billy Becket with a cup for the member of the August class in diving who, in the opinion of the instructor, Jim Dewey, had shown the most improvement. The winners in the meet, who were judged by their aggregate score in the long plunge, the race, and the diving were: "A" girls, Betty Harkness and Marion Stedman, tied for first; Francis Hodgins, second; "B" girls, Rosemary Bell, first, Dorothy Dunn and Lily Lee, tied for second; "A" boys, Donald Ripley, first, Frank Flowers, second, Desmond Morrow, third; "B" boys, Tommy Acheson and Billy Becket, tied for first, Harold Heale, second, and Pat Farrell, third. During the summer, Rita Sauriol, and her assistant, Mary Ripley, who qualified as classified instructors under the Royal Life-saving Association, conducted the classes.

SLUG DETECTIVE

A device has been developed in slot machines for determining whether the nickels inserted for candy bars, peanuts and such are real nickels or merely slugs. The mechanism consists of monel "fingers" which "feel" the coins, returning the slugs as these do not register the correct raised impression.



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

Stand Steady!

Probably it will be many weeks yet before the majority of us will have fully grasped the terrible implications of this war and the trail of broken pledges and gangsterism which has led up to it. Even now as the battle actually wages it seems preposterous that a civilization so rich in cultural and scientific progress and so inclined to the paths of peace should suddenly be mocking its own ideals because of the lust and barbarism of one man.

However confusing to the average individual may be the situation at this time, certainly the issue is abundantly clear. We of Canada and the British Empire face, with France, a ruthless and powerful enemy who has struck savagely at the foundations of our lives. Until the barbaric creed to which he subscribes is banished from among men, there can be no peace or happiness for us or for those whose future is in our hands. That we must prevail is inevitable.

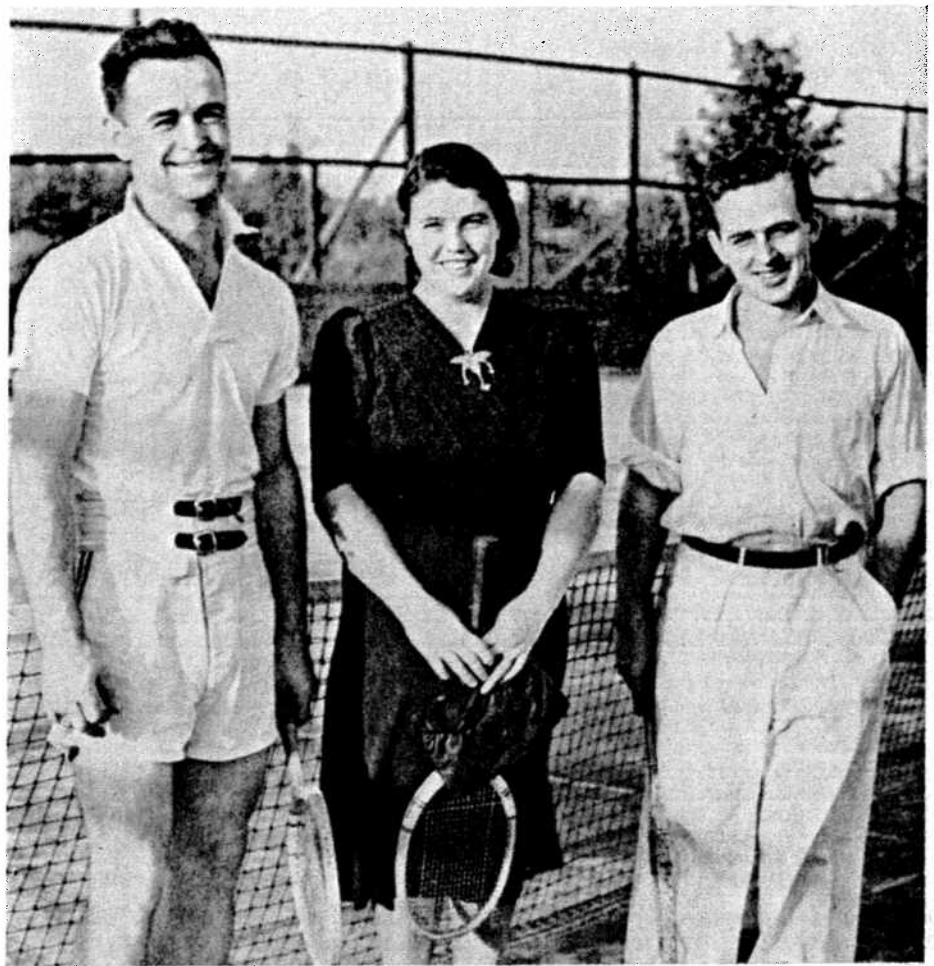
In this period of organization through which we are passing, as our leaders gird the nation for its contribution, it is so important for us to stand steady. When we know what is expected of us and come then to accomplish it, we shall find a firm and undisturbed morale of the greatest value.

To ignore wild and senseless rumours, to steel ourselves against the nerve-fraying suspense of the news, to accept as philosophically as possible the threat of dark days which must lie ahead of us, to go about normally and with cheerful determination, confident in our leaders and quietly prepared for whatever sacrifice we may be called upon to make—this is our job now. Stand steady!

Valuable Contact

When the Port Colborne foursome arrived to take part in the inter-plant golf tournament on September 9, it was the first sports exchange between INCOites of this division and our fellow employees to the south. That the occasion was a happy one goes without saying. Lymburner, Wilson, Augustine and Winger may not have returned home with the Beattie trophy, but they took with them the kind word that we're not such a bad bunch up here after all, even if our ore does have its peculiarities and our matte its odd little streak of cussedness. Which is all to the good

Creighton Trio Triumph



and prompts the hope that the two Divisions may be able to get their ambassadors together again soon.

PASS UP PLAYDOWNS

When Frood's intermediate softball team checked over its roster after winning the Royal Trading League title this summer, they found so many players on the injured or unavailable list that they turned over the Nickel Belt playdown ticket to Capreol. The latter were ousted two straight by Copper Cliff, who meet Timmins in the next playdown stage.

USE ORCO COPPER

Some 15 miles of copper wire from Ontario Refining Company were used in the "ground" for the new 325-foot radiator which Radio Station CKSO of Sudbury has recently added to its equipment. Greatly increasing the power and efficiency of the station, the new installation makes CKSO one of the most modern in Canada.

THIS TOPS THE TOPS

Tops are top consideration when it comes to stoves at the Physicians' Hospital, Plattsburg, N.Y. Tops made of "Ni-Resist"—nickel copper chromium cast iron—already are showing a 2 to 1 life over those of ordinary cast iron—a ratio that probably will increase with further service since records made elsewhere indicate a superiority of 4 or 5 to 1 for the alloy.

Several times postponed because Juke Pluve insisted on making uninvited and definitely unwelcome entries in all events, the Nickel Belt tennis championships finally came in out of the rain and were termed an all-round thorough-going success. Big feature of the event was the sweep made by three very able racqueteers from Creighton, who annexed three titles. Led by the veteran Vern Tupling, whose long tournament experience and powerful repertoire of strokes keep him king-pin of the district's players, the Creighton trio couldn't be stopped, despite the fact that the entry list was studded with court stars.

Tupling combined with Mrs. Davies to win the mixed doubles crown, the two taking the measure of Miss Kitty Young and Bert Flynn in the finals, 6-4, 6-4. With Gar Green, the former Queen's ace, Tupling stroked to victory in the men's doubles over Ronnie Nash and Joe McDonald, the scores being 6-4, 6-3. Green, who had been off his game earlier in the tourney, settled into the groove and played fine tennis. He and Vern make a fast strong-driving team who would probably go a long way in the province's fastest company.

To top these triumphs, Tupling also walked off with the district singles laurels, making no mistake in his title tussle with Joe McDonald, 6-2, 6-1.

Many expressions of satisfaction were heard concerning the smooth conduct of the tourney, these falling about the modest shoulders of the secretary, Roland Young.

Photo shows the triumphant Creighton trio: left to right, Vern Tupling, Mrs. Davies, and Gar Green.

Outstanding Results Shown in Developing Home Surroundings

Awards in the various classes of INCO's annual Garden Competition are released by C. D. Ferguson of the Company's Agricultural Dept., who speaks highly of the efforts of homemakers in INCO towns to beautify their surroundings.

"Many of these prize-winners," says Mr. Ferguson, "have overcome very definite handicaps to produce results. Many have spent a great deal of time and probably quite a bit of money to bring along their gardens. Many have had to sacrifice other activities in order to devote the proper care and attention to their plantings. But I think they will all agree with me that the effort has been decidedly worth while, and I should like to congratulate them all on their contributions to what I believe has been the best year in the history of this competition. Home grounds in our various INCO towns, on the whole, have come along by leaps and bounds, and who will deny the joy which comes from living in such improved surroundings. It's not a home until it's planted."

Judging in the contest was done by J. M. MacIntosh of Sault Ste. Marie, representative of the Department of Agriculture, and these were the awards:

Class I—The most attractive home surroundings in Copper Cliff, the effect of which has been obtained chiefly by the lawn and the flower plantings.

1, E. McKerrow, 13 Power St., \$20.00; 2, Wm. Acheson, 15 Power St., \$15.00; 3, Wm. Chisholm, 17 Rink St., \$10.00; 4, Robt. Stevens, 36 Power St., \$8.00; 5, R. Bell, 12 Oliver St., \$7.00; 6, C. Lyons, 4 Kent St., \$7.00; 7, J. Balmforth, 6b Peter St., \$5.00; 8, M. Kavanagh, 8b Peter St., \$5.00; 9, E. Piccini, 11 Venice St., \$5.00; 10, Guiseppi Sanchioni, 2b Craig St., \$5.00; 11, T. Montgomery, 35 Power St., \$5.00; 12, Harry Moore, 92 Balsam St., \$5.00; 13, M. J. Farrell, 29 Serpentine St., \$5.00; 14, Sali Syvanen, 14a Poplar St., \$5.00; 15, James Davidson, 9 Union St., \$5.00; 16, F. Lumley, 7 Union St., \$5.00; 17, Ralph Crouse, 14 Cobalt St., \$5.00; 18, Louis Switch, 8 Church St., \$5.00; 19, John Livingstone, 18 Orford St., \$5.00; 20, Bert Stone, 9 Cliff St., \$5.00; 21, Frank Jordan, 19 Market St., \$5.00; 22, A. E. Burford, 9 Power St., \$5.00; 23, F. Steadman, 5 Cliff St., \$5.00; 24, C. Byers, 9 Oliver St., \$5.00.

Class II—The most attractive home surroundings in Copper Cliff, the effect of which has been obtained by the judicious use of lawn, trees, shrubbery, annual and perennial flowers. Such plantings are fairly permanent in character and provide an all season effect.

1, Wm. Bradley, 13 Cliff St., \$20.00; 2, W. Chapman, 6 Kent St., \$15.00; 3, Harry Trotter, 1 Balsam St., \$10.00; 4, Gordon Keast, 7 Poplar St., \$8.00; 5, Frank Wolfe, 28 Serpentine St., \$7.00; 6, W. T. Balmforth, 23 Cobalt St., \$7.00; 7, Len Thomas, 19 Cobalt St., \$5.00; 8, D. Small, 18 Cobalt St., \$5.00; 9, F. Duberry, 20 Cobalt St., \$5.00; 10, G. A. Harcourt, 10 Power St., \$5.00; 11, A. J. Bray, 10 Balsam St., \$5.00; 12, C. O. Maddock, 19 Granite St., \$5.00; 13, R. H. Boehmer, 10 Granite St., \$5.00; 14, Alex McIntyre, 13 Park St. E., \$5.00; 15, T. Harry, 22 Oliver St., \$5.00; 16, Wm. Zinkie, 6 Oliver St., \$5.00.

Class III—The house surroundings in Copper Cliff on which the most improvement has been made in 1939. Such improvements may conform to the requirements in Class I or Class II.

1, R. Chugg, 8a Peter St., \$20.00; 2, Archie Guthrie, 18 Oliver St., \$15.00; 3,

Dassise Lauzon, 18 Cliff St., \$10.00; 4, Angelo Favot, 8b Craig St., \$7.00; 5, Gordon Adams, 12 Norite St., \$5.00; 6, J. A. Perras, 13 Cobalt St., \$5.00; 7, F. W. Heale, 6 Rink St., \$5.00; 8, Aldo Giommi, 3 Craig St., \$5.00; 9, Benjamin Degan, 13 Craig St., \$5.00; 10, Thos. Gladstone, 11b Church St., \$5.00.

Class IV—Best home surroundings in Coniston.

1, Harry Pigott, 128 Balsam St., \$10.00; 2, John Angove, 131 Balsam St., \$5.00; 3, F. Lalonde, 31 Second Ave., \$5.00; 4, Thos. Hood, 70 Third Ave., \$5.00; 5, Tiziano Tancredi, 112 Third Ave., \$5.00.

Class V—Best home surroundings in Creighton Mine.

1, Ed. Myhill, 33 Lake St., \$10.00; 2, Maurice Johnson, 7 George St., \$5.00; 3, Ross Clark, 24 Lake St., \$5.00.

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A well-kept lawn, neat flower borders, and brilliantly-coloured verandah boxes made up the formal part of Harry Pigott's grounds at Coniston this year, and first prize was his. At that he had a job on his hands to take the honor away from Sgt. John Angove, last year's winner, who placed second for 1939.

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Youngsters who were playing next door gladly grouped on the lawn at Ed. Myhill's place in Creighton for the Triangle camera.

Perennial winner of garden competitions, Ed. this year produced a particularly attractive layout for the judge, who probably took occasion to visit the strawberry patch in another corner of the grounds and do some official sampling.

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Neat as the proverbial pin and clearly showing the results of many hours of careful planning and attention were the grounds

at the home of R. Chugg on Peter St., Copper Cliff, when Judge MacIntosh made his rounds. These surroundings won the \$20.00 prize for the greatest improvement in 1939. Local color is added to the picture by two charming misses from the neighborhood, Ann Aubin and Virginia Digby. Ann's the blonde.

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Pride and joy of the John Antonini home at 10 Morrison St., Sudbury, is the grape arbor, where hundreds of clusters of luscious berries ripened last month. In two years John, who is yard foreman at ORCO, has brought these plants to rich maturity,

despite the claims of many of his friends that it just couldn't be done. Here he poses with his family beneath

the grape-laden vines, queries happily, "What's Italy got that I haven't got?" The Antoninis like grapes, and apparently grapes like them too, as this fifth photo in the layout would indicate. Poking its way persistently through a needle-eye opening in a window frame, a determined tendrill kept on growing and has eventually moved part of the Antonini grape crop right into their front parlor. If this sort of thing keeps up the Antoninis may have to evacuate to the back yard and turn the house over to the grapes, but John is so tickled with his vines that he probably wouldn't even mind that.

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Frankly enthralled with the prospect of all these good things to eat during the coming winter, young Jerome Perosini gazes in open-mouthed amazement at a display of preserves from the stock his mother has put away in their home at 442 Whittaker St., Sudbury. From a large

garden in which they grow almost every kind of vegetable and many fruits, Giovanni Perosini and his wife reap a rich crop of food for their family. Giovanni is a driller at Frood, where he has been employed since 1933.

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Dr. and Mrs. Jack Stanyon can be pardoned for the pride they take in the surroundings at the hospital at Levack, on which both have spent considerable effort. Crowning feature of the landscaping is a rock garden in the sloping lawn at the south side of the building.

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"Oh they're searchin' 'em on' the toon for McIntyre" is a well-known Copper Cliff ditty which the McIntyre himself has been known to warble modestly on occasion.

They seldom have to search very long or hard for Alec, though, because they usually find him enjoying a siesta beside this flower-banked pool at the rear of his home on Park St. His own creation, the pool has taken a lot of time and work, but Alec is already making plans for adding to its decorative qualities next year. He's thinking of colored lights and a fountain. The pool is the home of a school of very fat and contented goldfish, which Alec carefully transfers in winter-time to an aquarium in the house.

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Nickel Park at Copper Cliff has never been more inviting than it was this summer. Grass, shrubs, and flower beds profuse with lovely blooms have joined in an ensemble of natural beauty which has been a constant source of delight not only to Cliff residents but also to tourists, many of whom have been seen stopping for a rest and some camera play beside these 30 verdant acres. To INCO's Agricultural Dept. goes credit for the accomplishment, and the photo shows, left to right, C. A. Young, Robert Grigor, and C. D. Ferguson inspecting some of their horticultural handiwork.

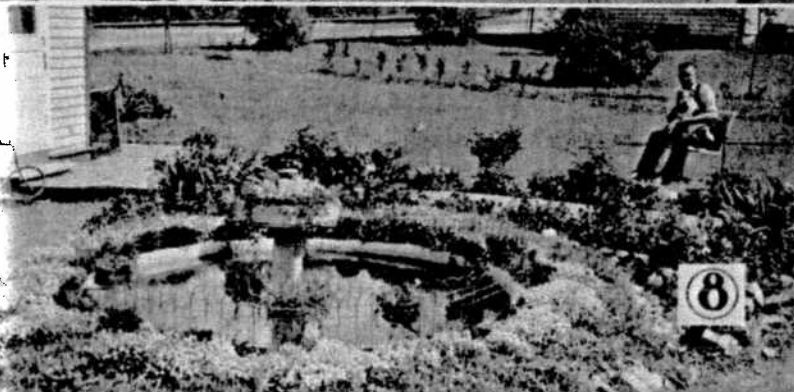
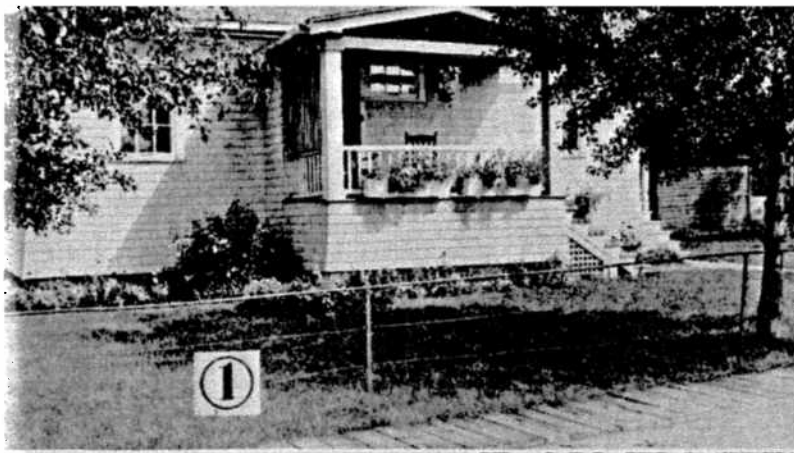
Hockey League May Be Dropped This Year

Possibility that unsettled conditions will force the Nickel Belt Hockey League to pass up organization this winter has puck fans speculating over the chance that one senior team might be recruited to represent the district.

Should such a scheme be put into effect, the team's managers would have a nifty list of prospects from which to make their selections. To name a few: For the rear-guard, Sargent, Burlington, Sherry, McIntyre, Price, Stahan, Grant; for right wing, Heximer, Newbolt, Shillington; for centre ice, Nicholson, Dewey, Conick, McGlashen; for left wing, Vaillancourt, Carriere, Brady.

Mashie-Wielders Seek Seagram Swag

Several INCO golfers took part in the annual Seagram Cup tournament at Sudbury Golf Club in late August, although Ron Silver of Creighton was the only one to finish in the money. Ron put together rounds of 90, 84, and 85 to win second prize in the second flight. Pete Nazar, the ORCO mashie-wielder who is this year's champion at Idylwyld, made a great comeback in the championship flight. Just getting under the qualifying wire with an indifferent 80 in his preliminary rounds, Pete posted two 74's for the next 36 holes and climbed from 15th to fourth place in the tourney standing, only one stroke away from a prize.



Diamond Drill An Ally of Mining

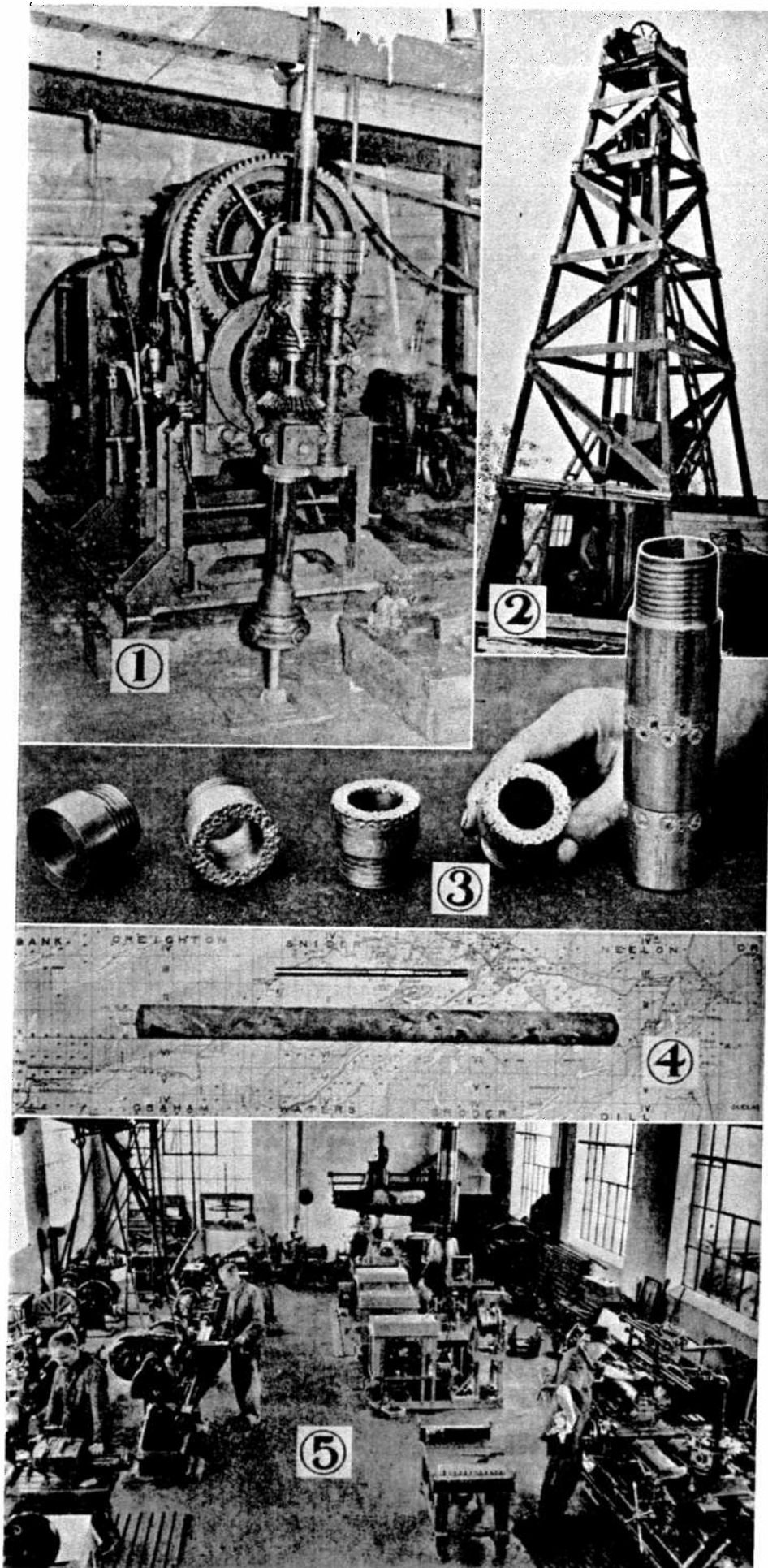
What is thought to be the deepest diamond drill hole ever bored in Canada was recently completed for INCO near No. 5 Shaft at Creighton. The hole measured 3136 feet, took approximately three months to drill, and was less than two degrees off the vertical when bottom was reached.

First photo in the accompanying layout shows the gas-driven diamond drill that did the job. Set on concrete because a solid foundation is essential in drilling deep holes, the machine is geared to keep its drill bit revolving at the rate of 1500 revolutions per minute as it bores deep below the earth's surface. The bit is screwed to the bottom of a series of 10-foot rods, more rods being added as the hole progresses. These rods are hollow, and a pump forces water at a pressure of some 300 lbs. to the square inch down through them to the bottom of the hole to wash up the cuttings and to keep the bit cool. Cuttings or sludge can be seen flowing out of the collar of the hole in the foreground. Necessity of cooling the bit can be appreciated when it is pointed out that once a hole has progressed about 3,000 feet, the long series of rods above the swiftly revolving bit pile up a dead weight of some seven tons on it.

Straddling the diamond drill in its protective shack is a four-legged derrick, which at Creighton was 60 ft. high and is pictured here. It facilitates the raising and lowering of rods in the drill hole. Between the rods and the bit is what is known as a core barrel, which is composed of two sections, an outer and an inner barrel, and, in this instance, was 20 feet in length. Between the two sections runs the water pumped from surface through the rods to the bit, and within the inner section is built up the core of rock cut out by the revolving bit. When a full length of core has been cut, the barrel is raised to surface, sealed, and sent to INCO's geological department at Copper Cliff, where the core is removed and carefully studied to determine the various rock formations through which the drill hole has passed. If an orebody has been reached, analysis of the core as it comes from the drill hole will reveal the value of the deposit. Withdrawing a series of rods from a drill hole to remove and replace a core barrel takes about five hours when the hole has reached a depth of 3,000 feet.

A diamond drill bit is made up with a circular blank of soft low-carbon seamless tubing, such as is seen at the left in this third photograph. Small holes are bored in the face of the blank to suit the size of the bort, or white diamonds, which are then "corked" into position by hand-punching the metal around and over the edges of the stone. These tiny white diamonds, imported from South Africa or Brazil, are oversupply considered too small or of inferior quality for polishing. From 70 to 100 of them, weighing about 15 carats, encrust the face of each bit. They cost from \$3.00 to \$7.00 per carat. At the right of the three bits in this picture is a reaming shell which is attached between the core barrel and the bit, and keeps the drill hole to a slightly larger gauge than that produced by the bit itself, to facilitate the passage of sludge back to surface. There are about 20 white diamonds to a reaming shell. It is necessary to replace a shell only about every 1,000 feet, whereas a bit on the Creighton job lasted but 50 feet or so. Each time a core barrel is removed from the hole, the bit is inspected.

Here's a piece of diamond drill core in



which variations in rock formation are evident from the light and dark coloring. A lead pencil provides contrast to show the size of the core. In the background is a section of a geological map of the Sudbury Basin. It is in these sticks of stone that the geologist reads the romantic story of the stress and turmoil which has gone on through the ages far beneath the earth's surface.

In this modern shop, equipped with the latest precision machines, Smith and Travers, Ltd., of Sudbury, produce the diamond drills and supplies used on INCO contracts. The firm was originally established in 1898 by Thos. E. Smith, whose two sons Wallace and Ray now guide its destinies in partnership with C. H. Hitchcock. They have handled contracts in every province of Canada, Mexico, South America, and Finland, and have drilled for everything from corundum to lignite.

Diamond drilling was first developed in

1863 by Rudolph Leschot, a French engineer who the following year employed a diamond bit to bore holes for blasting purposes in the construction of the Mount Cenis tunnel between France and Italy. Introduced into the United States in the late sixties, the method was used in Canada in 1871 when a bore-hole for coal was drilled at Springhill, Cumberland county, Nova Scotia. Despite the countless valuable accomplishments it has since had placed to its credit both in and out of mining, however, diamond drilling has never proven its worth to better advantage than it did at Frood in 1929. A drilling campaign was launched there to explore the deeper sections of the orebody, and after men on the job had perfected a wedging system to prevent deviation in a vertical hole where the bit was inclined to follow the line of least resistance when it struck soft rock, the rich ore below the 1500-foot level was probed and its size established for mining

operations. Since that time deep drilling has been used extensively in this field, and has undoubtedly had a far-reaching effect on the nickel industry.

Shift Bowling Draws Large Entry

With an entry of 26 teams, several of which are practically all-star in their personnel, a shift bowling tournament has been launched at Copper Cliff Club, and promises to be a very successful event. There are seven teams from the smelter, five from the general office, four from the shops, four from the concentrator, two from Creighton, two from the electrical department, one from the transportation department, and one from the town.



MADE GREAT BASEBALL BID

After playing heads-up baseball throughout the season and winning the Nickel Belt championship for the first time in many moons, Copper Cliff senior ball club ran into heart-breaking luck in their series with McIntyre for the Northern Ontario title.

Early in the series "Highpockets" McCabe, a mainstay of the Cliff pitching staff, suffered a leg injury which put him out of the game for the remainder of the season. Consequently the Cliff players returned from their McIntyre invasion literally "behind the eight ball" and resumed the series on Queen's Athletic Field diamond two games down.

At that they made a great stand. They tied the first home game. Then they rallied gamely and took two straight from the strong McIntyre club, and it was all square. In the deciding match, however,

the visitors got away to an early lead and were never threatened, even though Manager Herb Dupuis of the Cliff club had a telegram in his pocket announcing the arrival of a new son and all his men promised to celebrate the event with at least one homer each.

Photo shows the Cliff team: Back row, Lefty Collier, Elmer Baird, Herb Dupuis, Norm Hann, George Collins, Roy Longfellow, Tom Murphy; front row, Bruno Taus, Ginny Bertulli, Eddie O'Reilly, Percy Switch, Herb Perigoe, Gerry Wallace, Joe Lora.

Snapped in action as he burned in one of his fast ones is Tom Murphy, the Cliff hurler who covered himself with glory by handling the hurling assignment in the double-header which his team won from McIntyre. "Murph's" iron-man feat was one of the finest mound performances in Nickel Belt baseball history.

More than five tons of monel nuts, bolts and studs are used in the Fort Peck Dam in North Dakota.

Be a Tarzan! Try Gym Stunts!

Bob Burns was talking on the radio the other night about a fellow who was so strong he had muscles on his muscles. You'd think of Bob's wonder-man if you were to see "Chip" Chaplain gadding about on the horse and the parallel bars in the gym at INCO Employees Club.

"Chip" is a timberman on 2,000-level at Frood, and came to Sudbury from Windsor. Although he's only 21 years of age he has been a gymnastic fan for six or seven years, has learned a bag of tricks under the instruction of some of the best teachers in the game, and is keenly interested in getting a class organized at the Club.

"With a gymnasium equipped like this one," he says, "there's nothing to prevent us having one of the best gym groups in the province. And there's no better way to keep in condition and have fun doing it, than by gymnastic exercises."

"Chip" is a pretty good advertisement for gymnastics, at that. Here you see him with the old biceps bulging. **1** Strongfort or Sandow may have bigger bulges, but we'll warrant they're no tougher or better co-ordinated. And, in this second picture as "Chip" does a hand-stand, look at the way those back and shoulder **2** muscles are sticking out like the stops on an organ. "Just a little exercising now and then," is Chip's casual explanation of how he got that way.

Here he does one of the more difficult feats on the parallel bars, the front planche. **3** You lean forward until your wrists commence cracking, then lower your stiffened body taking care to keep your balance, and don't make a face while you're doing it—that spoils the whole effect. Try it on the sides of the baby's crib tonight, but first be sure to remove the baby!

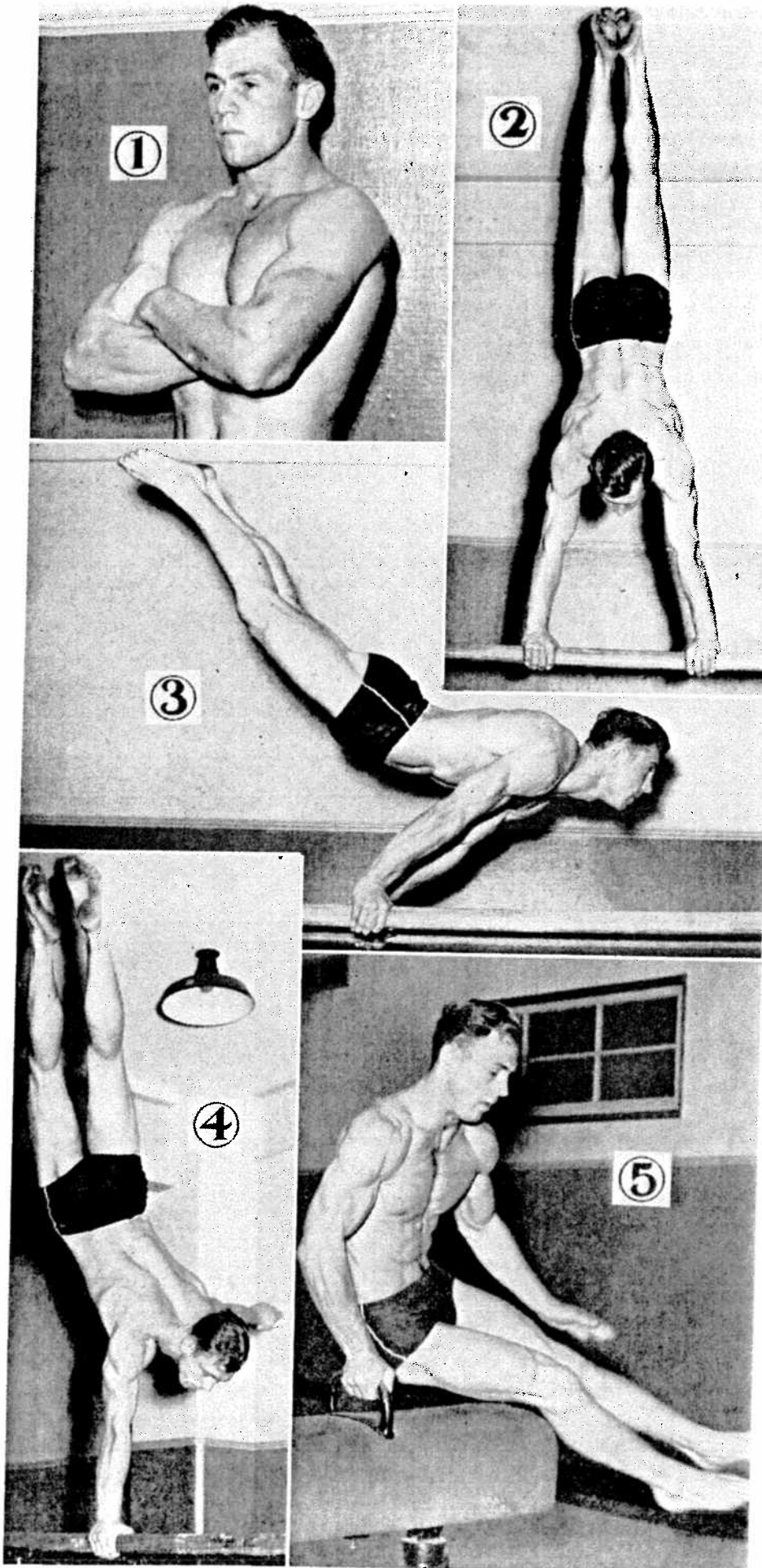
And just to prove he has nothing up his sleeve, so to speak, "Chip" does a one-hand stand on the bars. Originated by Tarzan of the Apes the day he **4** went picking coconuts and found that the bark of the trees tickled his feet, this delicate balancing act may take a little practising to master, but it's a sure-fire parlor thriller if performed on the edge of the grand piano when company's about.

Then, of course, if he gets tired of the bars or they get tired of him, "Chip" takes a few flings at the leather-covered horse. **5** Photo shows him concluding one of the standard exercises, in which you grasp the handles firmly and proceed to flip yourself around like the gyrotator in a washing machine. The trick is to complete the stunt without touching the horse, and it takes some fancy juggling, too. Note here, also, the muscular development which these exercises have given "Chip."

Mat work, pyramid building, and wrestling (ask Dolph Beaudry) are other Chaplain accomplishments. He's Canada's 1939 middleweight wrestling champ, as a matter of fact, having pinned Steve Kozak in the finals at Winnipeg last spring.

In any of these sports "Chip" is more than willing to pass along to others the fruits of his training and instruction. Employees Club members interested in forming a live-wire gym class should so profess themselves to Steward Barney Barnett, and the rest will be easy.

By a new process of "superfinishing," it is now possible in ordinary production of nickel plating to achieve parts with surface defects no more than two-millionths of an inch deep. Previously, an error of 25 millionths of an inch was considered excellent,



School's In Again

Labor Day stalled off the fateful moment a few hours longer than their regular summer-holiday span, but Tuesday morning, September 5, dawned as inexorably for INCO boys and girls as death and taxes come to their elders, and school was in **1** again. This picture, symbolic of a new adventure for those making their first day's pilgrimage to the halls of learning, was taken in one of the kindergarten rooms at Copper Cliff public school, and shows little Carle Ellen Johnston, daughter of Mr. and Mrs. George Johnston of Orford St., presenting a big red apple to her teacher, Miss Beryl Draper. Carle's dad works in the converter building at the smelter. Miss Draper, whose father is an INCO pensioner, could look back to the day when she herself started school in Copper Cliff, in the old schoolhouse recently torn down at the corner of Balsam St. and Evans Road to make way for the new dairy. One of her teachers was W. J. McPhail, now principal of the school in which she is employed and commencing his thirtieth year as a teacher. Among the 590 pupils registered this term in Copper Cliff public school Mr. McPhail sees sons and daughters of some of his former pupils, including his own young grandson. There are 15 teachers on the staff, four of whom were once his pupils. In the three schools at Coniston this fall there are 617 pupils; the public school, four teachers and 125 students; the separate school, 12 teachers and 413 students; the continuation school, three teachers and 79 students. Copper Cliff high school's enrolment is 190 pupils, with eight teachers. Garson has six teachers and 240 students. Creighton has eight teachers and 290 in the classes. In Frood village's one-room schoolhouse there is a class of 13 with one teacher. Levack has four teachers and 120 pupils.

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Bridge Dates Set

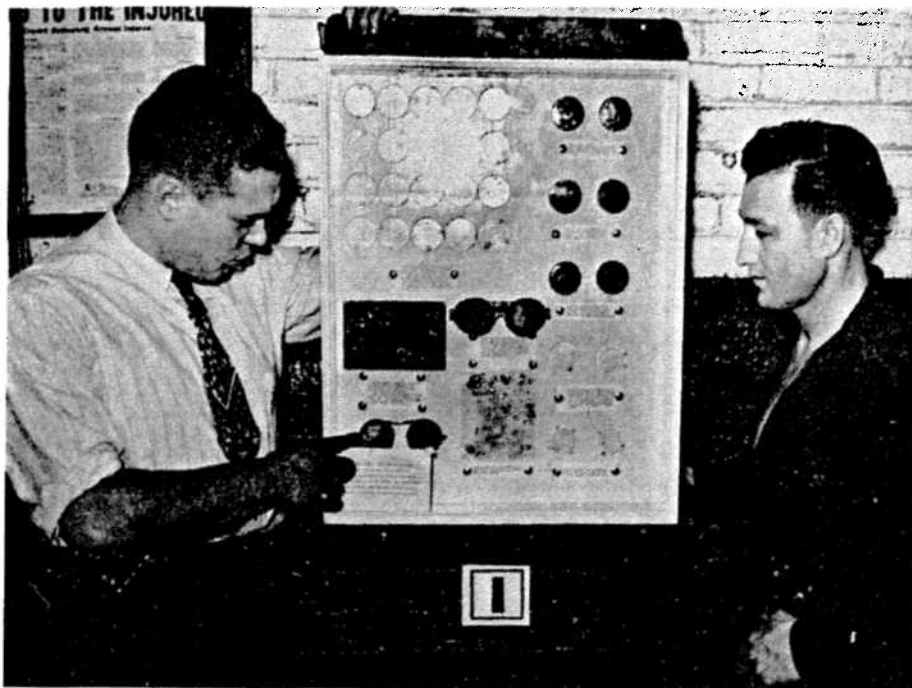
Mel Dundass, of Creighton, and Bill Cameron, of Copper Cliff, gaze fondly at one of the two engraved silver trays they received for being the highest-scoring **2** couple in the last INCO inter-plant bridge tournament. Similar awards will be made in the next three-game series for possession of the E. A. Collins Rose Bowl, now held by Frood. The series is slated for Memorial Community Hall on Tuesdays, October 24 and November 7-21. Teams are now being organized, six couples to each lineup, and a record entry is expected.

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Cliff's Peden Wins

Copper Cliff Athletic Association's colors came home in front in the first annual running of the 25-mile Seagram Trophy bicycle race held in conjunction with Frood's field day at Queen's Athletic Field in August. **3** Although heavy rains put the kibosh on most of the remainder of the program, the pedalling feature came off in great style. Vic Pianosi was the victorious speedster sporting the C.C.A.A. ribbon, and he's shown here as he received the handsome trophy from Sam Rothschild, with his brother Red beaming beside him. Frank Stack of Frood, second from the left, placed third, and Bruce Book of North Bay, third in the photographic lineup, finished second. Undismayed by the heavy rains, the Frood committee went ahead with their show, later held their prize draw, and called it a day. A couple of weeks ago they staged dinner parties at INCO Employees Club for all who had a hand in the damp but undaunted event.





The "Eyes" Have It!

A potent ambassador of safety is making the rounds of the various departments at ORCO these days, telling a story the men know full well but might sometimes be inclined to forget. Photo shows Safety Engineer Lionel Roy pointing out to Ted Knight of the Silver Refinery his display of goggle lenses which at one time or another have saved the eyesight and perhaps the lives of ORCO employees. Having inspected the layout and read the graphic captions, the ORCO worker must be deeply impressed with the protection his goggles afford him and the necessity of wearing them whenever safety requirements urge him to do so. One copper-encrusted lens in the display has this story behind it: a man was "floating" 1000-lb. V.C. cakes at No. 2 electric furnace when an explosion occurred, perhaps from some moisture in the mould, and molten copper splashed the protective helmet he was wearing; when the safety lens was removed it fell apart, but the fact that it remained intact in the frame certainly saved his eyesight and probably his life. Here's the tale told by another lens: a machine shop helper was using an air-powered chipping gun when the hose connection parted and the metal reducer on the hose flew up and struck the goggle lens over his right eye; the man was uninjured but without the goggles he would almost certainly have lost an eye.

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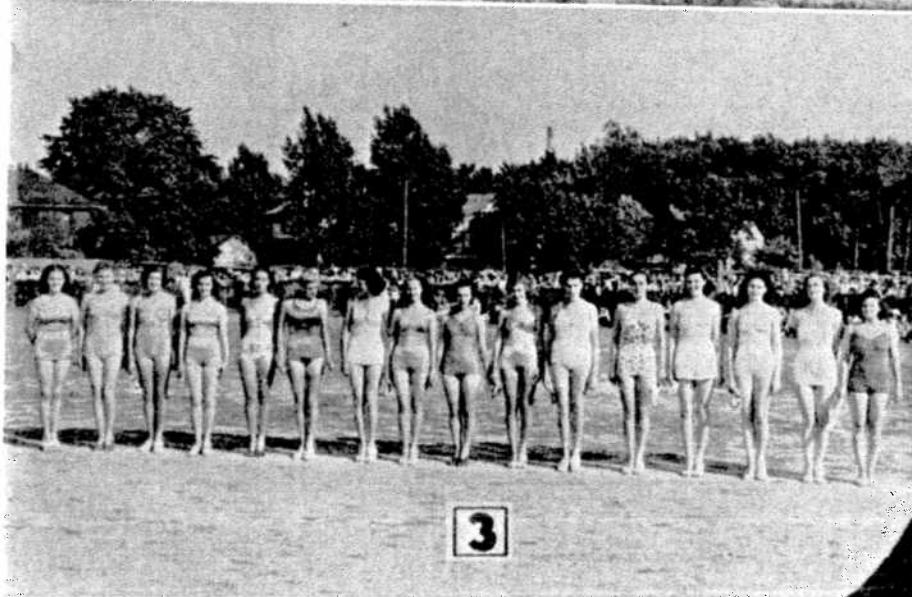
Save Baseball Bacon

Turning from the game but futile bid their senior team made for Northern Ontario honors, Copper Cliff Athletic Association found they had a championship ball club under their wing after all. While the bigger fellows were holding the spotlight in the McIntyre series, the Cliff junior lineup, under the management of Guy Hashey with Bert Flynn as coach, were quietly carving themselves a comfortable niche in the North's hall of baseball fame. Eliminating Falconbridge for the Nickel Belt title, the juniors then routed North Bay 11-8 and 4-1. In one game with Kirkland Lake for Northern Ontario laurels they scored eight runs in one inning, won 11-4, took the other engagement 13-7. On September 16 they soundly whipped Morrisburg Sailors, holders of the Eastern Ontario title, 10-2, young Fox Didone yielding only three hits in the sudden-death struggle. Now the Cliff kids stand by while Guelph, Niagara Falls and Toronto squabble for Southern Ontario honors, and then if the weather holds out and C.C.A.A. still feel paternally indulgent, they'll have a crack at the All-Ontario championship. Classy baseball is played by this all-star crew from the Copper Cliff League, with Didone continuing to shape up as a top-notch senior prospect along with Buster Paquette behind the plate and Dave Chapman in left field. Photo shows the team: left to right,

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"Port" Pulchritude

There were 11 contestants from Port Colborne in this parade of pulchritude which was held in conjunction with the big aquatic and athletic meet held under the INCO Athletic and Welfare Associations at "Port" in August. Miss Ruby O'Donnell of Toronto, third from the right, was adjudged "Miss Port Colborne of 1939," and had the special thrill of receiving her prizes from the beauty queen of her own city, Nan Morris, who was present for the occasion. Two Port Colborne girls, Betty Dobransky and Betty Burgess, placed third and fourth. Hilda Hannigan of "Port" was also one of the six finalists. Albert Hicks had the enviable job of chairman of the Beauty Contest committee.



Refinery Team Cops Nickel Belt Softball Title



A hectic season of softball which was finally highlighted by the remarkable display of power by Falconbridge in eliminating Copper Cliff when the chips were down, wound up as many a sound prognosticator felt it would. ORCO's blue silks dominated the finals and the classy Refinery crew annexed the Nickel Belt title and now await the O.A.S.A. Senior B eliminations. Photo shows the team: Front row, J. Ramsay, rf; C. Marshall, c; C. Scott, 2b; H. Haddow, 1b; J. Grieves, ss; N. Jennings, 3b. In the back row: J. Aurie, of; W. Hart, 2b; N. Devana, p; J. Crawford, manager; G. Jenkins, p; B. McNabb, 1f; B. Signoretti, of. Absent are C. Atkinson and A. Mallett, catchers.



2800 LEVEL SETS RECORD

General Safety Engineer George Jarrett on Sept. 1st rubbed his hands with brisk satisfaction and proceeded to mark up another gain for Mining and Smelting Division safety on the big chart which hangs in his office.

August of this year, with .067 lost-time accidents per 1,000-shifts-worked, was a definite improvement over the corresponding month of last year, for which the figure was .076, and although 1938 was INCO's best safety year to date, 1939 has

this far bested it in every month except April and May.

For the first time in Froid history, an entire level has completed a full year of operation without a lost-time accident, a great contribution to the 1939 drive for greater safety accomplishments. The level, to which is turned the envious but none the less admiring attention of the rest of the Division, is 2800. From August 26, 1938, up to this writing, they had piled up the imposing total of 96,471 safe shifts. Photo shows a group of the men from the 2800, where Norman Anderson and Ole Edin are the level foremen. Three of their fellow-workers cashed in on the Safety Draw for which their division qualified in August, E. Cvar, stope boss, holding the lucky ticket for the \$25.00 prize; J. Dennis, blockholer, and A. Vardzel, timberman, got \$15.00 and

\$10.00 respectively. In the September draw the 2400 level took the money, which went to tickets held by M. Prociuk, driller; P. Kopsa, blockholer, and Z. Mikliet, timberman.

By no means overshadowed by the Froid achievement was the splendid safety mark hung up at Levack, where Safety Engineer Larry Walkum reported no lost-time accidents in the whole force during June, July, and August.

SEALS GLASS TO METAL

Recently developed is an alloy of nickel, cobalt, manganese and iron which provides a glass-metal seal. The similarity of the rates of thermal expansion and contraction of the two unlike materials eliminates the possible breakage of the glass. The new alloy is also a good conductor of electricity.

Close Contest In Golf Tourney

Ontario Refinery's four golfing aces successfully defended the R. L. Beattie trophy in the second annual INCO inter-plant competition at Idylwyde on September 9, but they had to go two exciting extra holes before they could stave off the determined challenge of the Smelter contingent.

Eight teams, biggest entry yet, took part in the matches and four of them finished within three strokes of one another. Frood got away to a great start on the opening nine and were leading the field with a total of 178, with ORCO and Smelter tied for second position with 180 each and General Office at 181. The Froodians slipped off the pace in the second nine, however, and wound up with a gross of 368. General Office totalled 367, and ORCO and Smelter remained tied with 365 each.

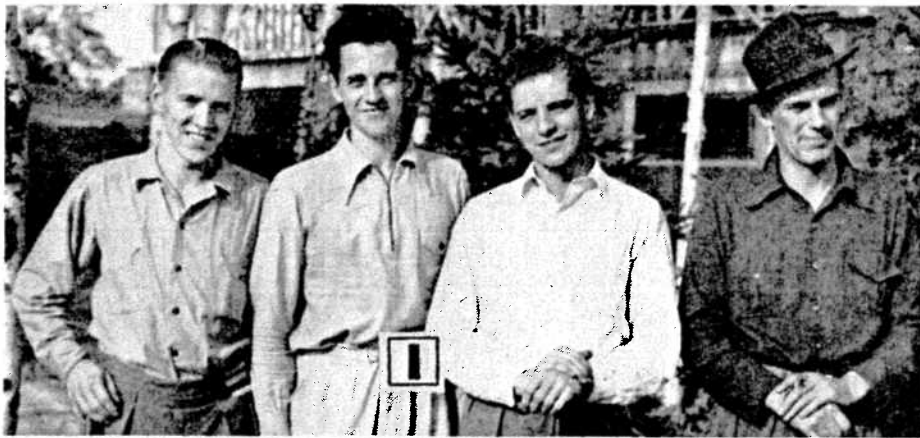
Rules of the competition called for as many extra holes as were necessary to break the tie, so in the gathering dusk the two teams went back at it again. At the end of the first extra hole they were still deadlocked, but Refinery settled right down to business on the long second while their opponents were finding the rough, and that was the end of the battle. A big gallery followed the two quartets during the playoff and roundly cheered both victors and vanquished. The following Saturday ORCO left no doubt of their superiority when they defeated Smelter in a friendly challenge match over the 18-hole route.

These were the winners: Pete Nazar, captain of the ORCO lineup, whose 88 was one stroke off the medalist score for the day; Charlie Ness, who had to fight a running skirmish with an attack of grippe throughout the matches; Phil Nazar, who was second best scorer on the team with a 90; Jack Noble, who came out of comparative retirement to fill out the lineup and flashed some very fine strokes.

And these were the runners-up: Jack Graham, former star who has been out of the game the past two years; Jim Croal, long hitter whose 40 on the second round was the best nine-hole tally of the day; Charlie McCoy, who put together a 41 and a 44 to cop the special medalist prize, an electric razor; Sam Nute, this year's winner of the Graton trophy at Idylwyde.

A heavy course, chilly weather, use of the back tees, and competitive pressure skyrocketed the scoring for the day, and few were the birdies, nihil were the eagles. Fifth in the standing came Creighton, led by Ron Silver with a 91 and represented also by Art Silver, Bill Lake and J. C. Hogan. The Port Colborne quartet failed to get clicking and were forced to be content with sixth position, their total being 395. Another first-year team, Garson, were seventh with 434, and Meds good-naturedly brought up the rear with 447.

At the dinner party afterward in the clubhouse the trophy was returned to the custodianship of ORCO by its donor, R. L. Beattie, second from the left in this group, who warmly congratulated the winners and promised them they could keep it if they won it next year. Prizes of electric clocks to the winners and Hudson's Bay blankets to the runners-up were presented on behalf of INCO General Athletic Committee by J. W. Gemmell, who is seated fourth from the left with E. A. Collins on his right, and on his left Bob Watson, Idylwyde Club captain who acted as referee-in-chief for the matches and presented the medalist prize on behalf of



its donor. Also at the head table are seen H. J. Mutz, who led the scoring for General Office and tied with Pete Nazar as runner-up to the medalist, and Fred Benard. Inset immediately above them is Johnny Yusko, of Frood, intent on his victuals; others on the Frood team were Charlie Price, J. B. Higgins, and "Joe the Pro" Beaulieu. Inset below the head-table group is Art Silver of Creighton.

Garson were lauded for their splendid showing, in view of the fact that they were getting their first look at the course and had played comparatively little golf this year. Commencing second from the left, they were: Len Bressenden, "Taffy" Davis, Angelo Fyfe and George Rosenplot.

Port Colborne's good sports may have been outplayed on the course but they certainly held their own at the festive board. Left to right: Finlay Lymburner, Jack Wilson, Glen Winger and Stu Augustine. The latter has closed his eyes in the fond but forlorn hope that when he opens them again there'll be a brick of ice cream in front of him.

Chairman for the dinner was E. A. Collins, who distributed various special prizes like an axe, a compass, a magnifying glass, etc., where it was felt they would do the most good. Musical numbers rounded out the evening.

New Cliff Pavements

A very popular improvement with district motorists are the stretches of new pavement being laid this fall in Copper Cliff. Photograph shows equipment of the construction company engaged in digging out the old pavement on Granite St. in preparation for the new road which gets a substantial foundation of slag before the tar and gravel go down. Pictured also is a section of the new paving through town which is part of Highway No. 17, and which has been completely rebuilt.

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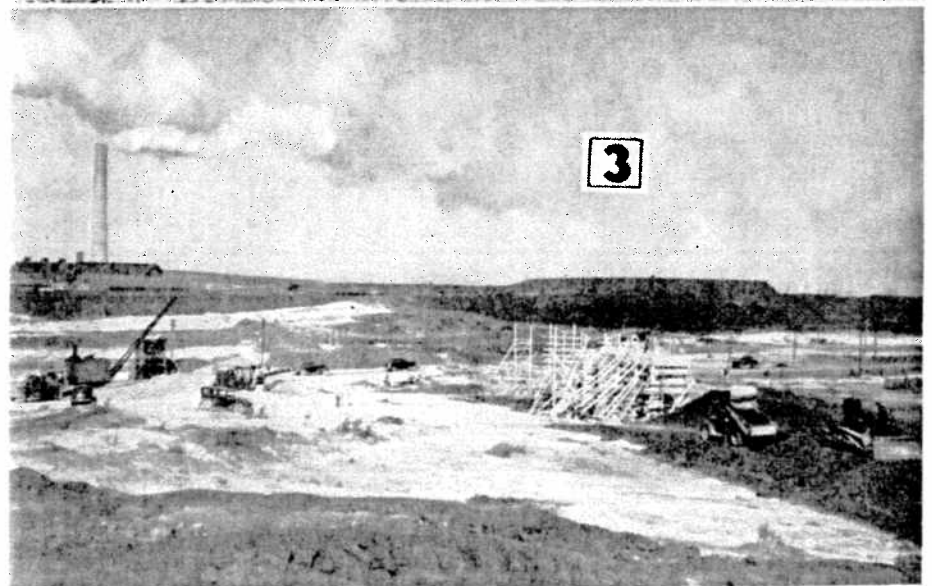
Building New Spur

Some 210,000 tons of slag will be hauled for fill for the new railway spur which is to be run from a point opposite Copper Cliff Smelter to Ontario Refining Company. Expected to be completed in February, the spur will accommodate transportation of hot metal cars and other supplies to the Refinery, and will replace the present railway route through Copper Cliff as well as the trestle bridge now used at the Refinery.

Building of the spur is being handled for INCO by the Rayner Construction Company of Leaside, Ont. A total of 125 men, 18 trucks, a pile driver, a two-yard steam shovel, a one-yard concrete mixer, and two caterpillar bulldozers are being used on the job.

Three steel span bridges with concrete abutments will carry the new spur over the Canadian Pacific Railway, the street car tracks, and the highway. Over the railway the bridge will have a 60-foot span and a 23-foot clearance. Over the street car line the span will be 22 feet and the clearance 14 feet nine inches. Over Highway No. 17 there will be a two-span bridge 102 feet in length with a concrete pier in the centre of the road, which will, of course, be considerably widened at this point. Clearance will be 14 feet six inches.

Platinum is really but one of a whole family of metals, its sisters being palladium, rhodium, iridium, osmium, and ruthenium. Though all are white in color and possess notable resistance to corrosion and high melting points, they differ in structure and other properties.





Owens Levack Plane

There's a miniature air force anchored at Larchwood these days, no less than four planes privately owned by flying enthusiasts of the district being kept on the big landing field there. One of them is the property of Ross Armstrong, stope boss on the 1100 level at Levack, who is shown here with his ship. Coming to Sudbury about three years ago from Stettler, Alberta, Ross went to work at Frood and was there two years before being transferred to Levack. About a year ago he took up flying, and last fall bought his plane, a 200-h.p. Valkyr he picked up at a bargain in Brantford. He got his private license this summer, and now has 35 hours of solo flying to his credit. Many of his friends have had the thrill of a flight in his plane over the Levack country. The ship has a cruising speed of about 115 m.p.h., carries two passengers besides the pilot.

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Conclude Big Season

Although they have had to shop as far afield as Timiskaming in the province of Quebec to get opposition, Levack girls' softball team are winding up another highly successful season in which they have put the skids under every club they've met. They won the annual girls' softball tournament on their home diamond, vanquishing several high-class visiting line-ups, and retain the trophy they picked off last year. Photo shows the team: Seated, left to right, Laura Mallette, ss; Orize Monette, lf; Gladys Peterson, c; Beth Winton, lb; Margaret Withers, sub.; Anne Skuro, 2b; Mina Predon, cf; Helen Koski, rf; Rose Piaskoski, sub.; standing, Rose Mahon, captain and pitcher; O. Chappell, manager. Absent when the photo was made: Jean Germaine, Lillian Hanson, Anne Peterson.

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Rout Accident Bogey

Supt. R. H. Waddington of ORCO called half a dozen foremen from the plant into his office the other day and asked them to take back to their fellow-supervisors and to the men in general his heartiest congratulations on a singular safety achievement. Best previous record for the plant, established in 1936, was 95 days without a lost-time accident. With no lost-time mishaps to mar its records since June 2, ORCO this year has completed 103 days at time of writing, and is geared to stretch the record as far as careful workmanship and safety co-operation will take it. Of the 60,229 safe shifts included in the 103 days, an outstanding contribution was that of the Casting Department, which hung up a new record of its own with 12,718 shifts without a lost-time accident. Foremen shown in the photo: seated, A. J. Bernard and M. Bell; standing, left to right, W. W. Greenwood, C. G. Caswell, J. W. Black, C. B. Matthews, and W. J. Marshall.

INTER-CLUB TROPHIES

A trophy donated by Vice-President Donald MacAskill for annual competition between the golf clubs at Port Colborne and at Lookout has promoted such a popular exchange of matches that this year Mr. MacAskill put up a similar handsome prize as the award for the yearly inter-club event between Idylwyld and Sudbury golf clubs. Defeating their opponents both at home and on their own course, the Idylwyld team last month became first holders of the trophy. Port Colborne were victorious over Lookout in their 1939 matches, played in August.

Loved Ones Safe

With shocking swiftness the full realization of war came home to Nickel District residents when news was received that among the passengers on the liner Athena, victim of a cruel and heartless enemy submarine attack, were the wife and two daughters of George Ferguson, Copper Cliff electrical worker. For two days and two nights Mr. Ferguson and the three children who remained at home with him frantically sought news of the welfare of their loved ones, or sat in quiet desperation beside their radio awaiting some glimmer of hope. Finally they got the message for which they prayed: "All safe, Kitty Ferguson." Photo shows Mr. Ferguson with his kiddies and his brother-in-law, George Salkald, Frood employee, at the conclusion of their gruelling vigil.

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Littlest World Series

Victorious over Georgetown's "Cincinnati Reds" in a three-game series for title honors in the "Littlest World Series," Copper Cliff's "New York Yankees" returned from the southern sports hotbed and hung up their spikes with sighs of contentment. As was the case with the midget hockey last winter, it was Gordie Alcott who promoted the Cliff midget league, prevailed upon C.C.A.A. to give support, caught the ear of an enthusiastic backer of boys' athletics who donated a century note for running expenses, and finally coaxed Toronto Baseball Club into putting up a trophy for all-Ontario competition. The Georgetown series was the result, and the smart little Cliff team had no trouble winning it. Next year there will probably be a much larger entry. Bound by a good behavior contract as in the hockey setup, the Cliff boys hoarded their pennies to cover half the cost of uniforms. Here's the lineup, left to right: back row, Gordon Alcott, Rich Dopson, Al Wulff, John McCarthy; middle row, Ellis Rodgers, John Morrow, George Trezise, Art Dunn, Reno Basso, Fred Cundari; front row, Artie Wulff, Wes McNeice, Dan Smith, Herc Flynn, Ed. O'Reilly, Dan Kelly.

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On Home Guard

Declaration of war called for immediate measures for the protection of INCO plants from possible sabotage, and many special constables were promptly sworn in to assist in this work. Three members of this "home guard" are seen here signing up for service, with Justice of the Peace Tom Mulligan of Creighton administering the oath. The volunteers are Jim Lawson, pen in hand; W. J. Digby, and Frank Matte, all of Copper Cliff.

MEET GREAT SUCCESS

With a large entry of prominent contestants from other centres in Ontario and from Buffalo to give local stars plenty of opposition, Port Colborne athletes acquitted themselves with great credit in the big athletic and aquatic meet held August 7 under the auspices of the INCO Athletic and Welfare associations. It was a big day at the Port Colborne harbor and at Elgin Athletic Field, one of the biggest sports programs the lakeside town has ever witnessed. The walls of the inner harbor were lined in the morning as the aquatic events took place, while in the afternoon Elgin Field was jammed, the stands holding but a small fraction of the dense crowd.

Ideal weather favored the INCO organizations for their big day. A bright sun prevailed most of the day, clouds in the west about noon passing away without bringing the threatened rain.



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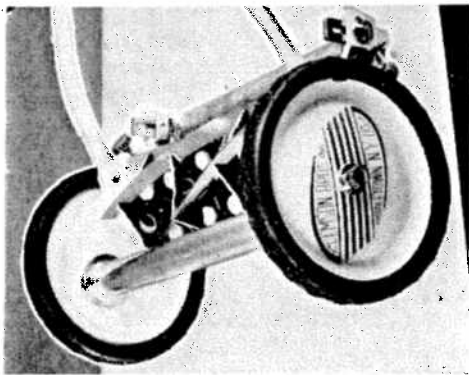


Dressing Up The Lawn Mower

Many of the methods which automobile manufacturers have used to dress up the appearance of a motor car have been applied to beautify a new type lawn mower. Other methods also have been borrowed from the same industry to provide this new "front yard" vehicle with other distinctive characteristics. It is strong, durable, light in weight and streamlined.

As has been the case with the motor car, it is necessary for protection against corrosion as well as for the sake of appearance, to provide the die cast as well as other parts of the mower with a suitable finish. This has been accomplished by a unique combination of nickel and chromium plating and the application of the same type of baked-on enamel used for motor car bodies.

More than 15 parts of the mower are plated. Most of them are die-castings, including such structural parts as the wheels as well as set screws, hand screws and other accessories. Other plated parts



are of steel, including the tie-rod and handle crossbar.

Methods used included the usual sequence of deposits of copper, bright nickel, and chromium. A nickel flash was first applied, followed by bright copper to bring the combined thickness of the coating at this point up to 4/10,000 of an inch.

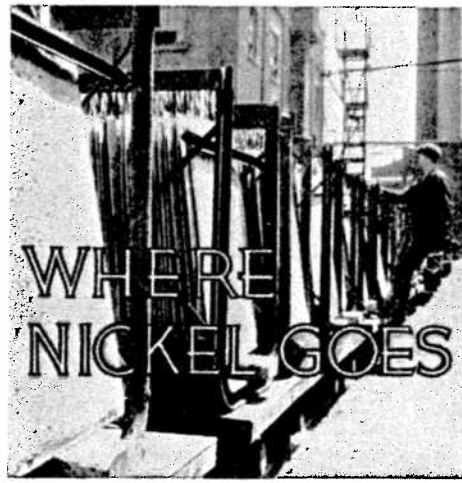
Following the copper, a coat of 5/10,000 of an inch bright nickel was applied before the plating on of the chromium. This procedure was followed both with the die castings and the steel.

The finished lawn mower thus represents an almost completely plated job, with nickel being used throughout. Use of a nickel underlayer has been found indispensable for whatever finish is to be applied—chromium, brass, copper, or other coating.

Aside from its distinctive appearance, the lawn mower reveals many unique structural features. The blades are cast as insets in the die-cast supporting members. The two gear housings have been provided with integrally-cast lugs for fastening the tie tube and thus assure correct alignment. The wheels are die-cast in one piece with integral gearing.

Exact adjustment and alignment of the bed knife blade is provided by a hand-operating set screw operating a control rod which functions on both ends of the knife. The screwdriver method of older-type mowers, with efficiency limited largely to the ends of the cutting blade and the resulting torsional strain, has been eliminated.

Eleven houses in the New York World's Fair "Town of Tomorrow" feature kitchens showing the latest developments in monel equipment for home use.

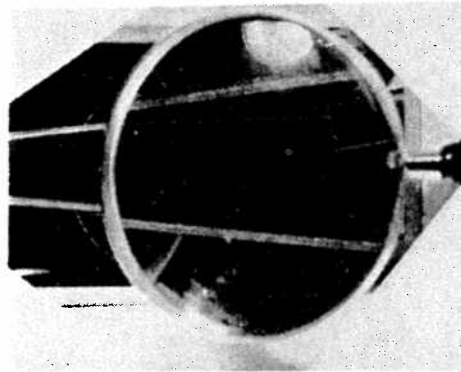


Producing a Flea's Sun Porch

A pure nickel tube with a hole so small that a strand of human hair could not pass through it is on display at the West Virginia State Exhibit at the New York World's Fair. It is believed to be the smallest metal tube ever produced and measures 26/10,000 of an inch in diameter. Its hole is about 1/3 of this size and the thickness of the metal is 7/10,000 of an inch.

Made from pure nickel produced at the Inco Huntington Works, the tube was drawn down to its present dimensions by the Superior Tube Company, Norristown, Pa. Because of the almost microscopic size involved, the making of the dies taxed the craftsmanship of the most experienced die makers.

Pure nickel was used in preference to ordinary steel or other metal subject to rusting because even a slight speck of rust



might clog the tiny hole. It is so minute that a coil one pound in weight strung in a straight line would reach from the Trylon, around the peak of the Empire State Building and down to the Battery—a distance of approximately 11 miles.

The tube is displayed in a novel device known as the "Quadrylon," made of transparent material to a design suggested by the Trylon. Within the Quadrylon, the tube is submerged in oil. Air, forced through the tube, actually blows bubbles. Fifty pounds pressure is required to force air through the tube. The tube itself can barely be seen with the naked eye and magnifiers are provided for visitors. For purpose of comparison, a common pin is suspended by a strand of hair alongside the tube. Produced especially for display purposes at the Fair, the tube as yet has no commercial applications, though tubes of slightly larger size are used in certain types of hypodermic needles and for various laboratory purposes.

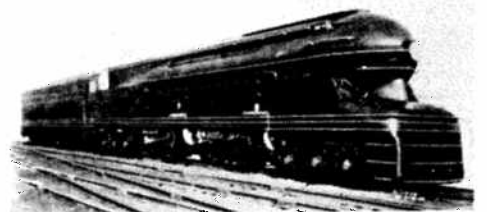
Make World's Largest Engine

Featured at the New York World's Fair as the "largest locomotive in the world," this steam giant of the rails weighs, with its tender, over one million pounds, measures 140 feet in length and can pull a 14-car train at a speed of 100 miles an hour or faster. Engineers of the three largest locomotive building companies and of the Pennsylvania Railroad collaborated in its design and construction. It was built at the Pennsylvania's shops at Altoona, Pa.

It is estimated that the new locomotive, equipped with four cylinders, will develop a minimum of 6,500 horsepower and will deliver 76,400 pounds of tractive force.

In order to provide the necessary strength and other safety factors and lower dead weight, designers of this new giant followed a common railroad practice of using nickel steel for parts subject to stresses and wear.

In the boiler, for instance, designed for a working pressure of 300 pounds per square inch, various structural parts, such as shell plates, liners and outside fire box



sheets are made of low carbon nickel steel, containing approximately 2 per cent. nickel.

Main and side rods, front and main crank pins, engine trucks and trailer truck driving axles, piston heads, piston rods, crossheads, valve gears, radius rods, lap and lead levers, link lifters and union links, are made of forged nickel steel. Also, in accordance with modern railroad practice, the 8 drive wheels, the 12 engine truck and trailer wheels and the 16 tender wheels are all equipped with Timken roller bearings of nickel alloy steel.

The use of nickel alloy steels in railway locomotives is no new development, since such steels were first employed in both rolled and cast form as far back as the beginning of this century. The number of applications ever since has been steadily on the increase. As is true in other types of machinery, the extra strength imparted to locomotive parts through the addition of nickel to the steel not only permits the lowering of dead weight with safety, but also contributes to long-run operating economy.

Locomotive builders who collaborated with Pennsylvania Railroad engineers in the construction of the locomotive were: The American Locomotive Company, Baldwin Locomotive Works and Lima Locomotive Works.

NICKEL GOES ARTY

What have been called by art critics the best reproductions of oil paintings ever made in this country, are being produced inexpensively by a new technique which uses a gelatin-coated monel plate with an exceptionally fine half-tone screen. The process eliminates hand work, thus avoiding hard lines and sharp edges in the reproductions.