ALGOMA EASTERN RAILWAY

Manitoulin and North Shore Ry. Contract.

The contract for the construction of the section from Crean Hill to Whitefish, about 46 miles, including the loop, tenders for which were recently invited through the Railway and Marine World's advertising columns, has been awarded to the Superior Construction Co., of which T. J. Kennedy, heretofore General Superintendent of the Algoma Central and Hudson Bay Railway is President, and J. D. MacArthur, Winnipeg, Vice President. Considerable progress has been made in the preliminary work necessary for the organization under the contract and to get outfits on the ground, and the work will be pushed through as rapidly as possible. The Superior Construction Company has its head office at Sault Ste. Marie, Ont., but the operating head office, at which Mr. Kennedy is located, is at Espanola, Ont., where the M. & N.S.R. connects with the C.P.R.

MARCH 1911

The Main Nickel Range.

The main nickel range of the Sudbury region is incorrectly shown on the geographical map of the region prepared by Dr. Bell and on all later geologically colored maps, which are largely copies of his; since the norite or gabbro associated with the ore bodies is not separated in the coloring from adjoining greenstones and hornblende porphyrites. The most important p___cal improvement in the map now under preparation by Dr. Barlow will probably be this separation; for it is now very probable that all important ore bodies occur at the edge of the norite, no matter what the adjoining rock may be, granite, quartzite or hornblende porphyrite; or on dike-like extensions of norite into the others. Until Dr. Barlow's map appears the exact location of this boundary will be somewhat uncertain, but the following statement drawn from his work may be of service in the meantime:—

"The most important and famous band of norite, however, is the southern belt, which, starting in more or less isolated patches and areas in the township of Drury, coalesces into one large band in the eastern part of this township. It then extends in unbroken continuity in a northeasterly direction as far as lot 3, concession III, of Garson, a distance of over thirty two miles. The basic or norite portions of this band would average nearly two miles in width throughout its length. In the township of Denison, the basic rocks extend over the greater part of the third, fourth, fifth and sixth concessions. About lot two, the band attains its maximum width of nearly four miles, but a short distance east it is divided up into two belts by the intrusion of a mass of coarse "augen" granitite-gneiss. The northerly, which is the more important of these two belts, has a course of NN.E. through the northeastern part of the township of Denison and the southeastern corner of the township of Fairbank. Thence it extends across the Vermilion river, covering part of the township of Graham and portions of the township of Creighton. From thence it runs across the central part of Snider, through the northwestern corner of McKim and the southeastern part of Blezard and, with the exception of lots 1 and 2, extends continuously across concession III. of Garson. Through Creighton and Graham, this belt is over two miles in width, while near the old Dominion mine it is almost three miles from north to south across the norite. The southern branch of this great belt runs across the Vermilion river, covering parts of Graham, and thence on through Waters past Copper Cliff, where it rejoins the other branch. The lenticular mass of granitite gneiss which divides this southern belt into two portions, thus occupies a strip of country one and a half to two miles wide through Graham and Snider, terminating at or near the Copper Cliff mines. It is newer than the norite, piercing and altering the basic rock."[17]

The account of the main range just quoted must of course be looked on as provisional and subject to revision when Dr. Barlow's final report appears. The portion of the account referring to the division of the range, does not entirely tally with my own observations, as will be s___ater, the outcrops of gabbro to the south of the main range appearing to be very narrow and scattered, not at all to be compared to the solid band two or three miles wide on the north. It is doubtful also whether the granite between the north and the south parts of the range is all later than the norite, though some of it certainly is.

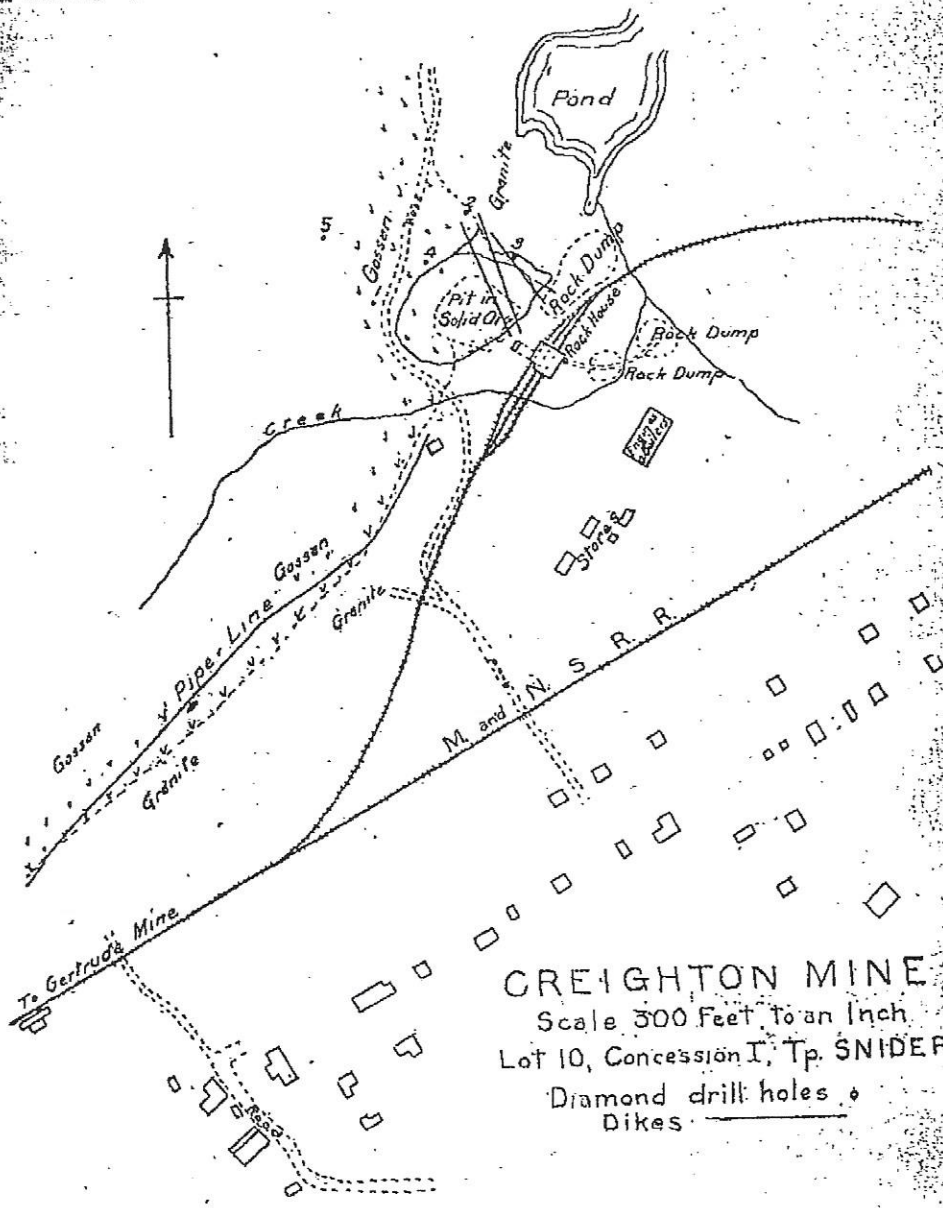
The best view of the arrangement, so far as my own examination goes, is to suppose that the ore deposits of what Dr. Barlow calls the southern branch of the range are connected with more or less dike-like projections from various points on the northern range. If this is correct we can divide the mines into those situated on the south or southeastern edge of the norite band, such as the Gertrude, Creighton, North Star, Elsie, Murray and Blezard; and those situated on narrow offshoots to the south or southeast, including perhaps the Worthington, the Evans and Copper Cliff, the Frood and Stobie.

It will probably be best to take up in detail a typical mine of each class and refer to the others less fully. As good examples of each the Creighton may be chosen from the main range and the Copper Cliff from the southern off-shoots.

[17] Sum. Rep. Geol. Sur. 1901, pp. 144-5.

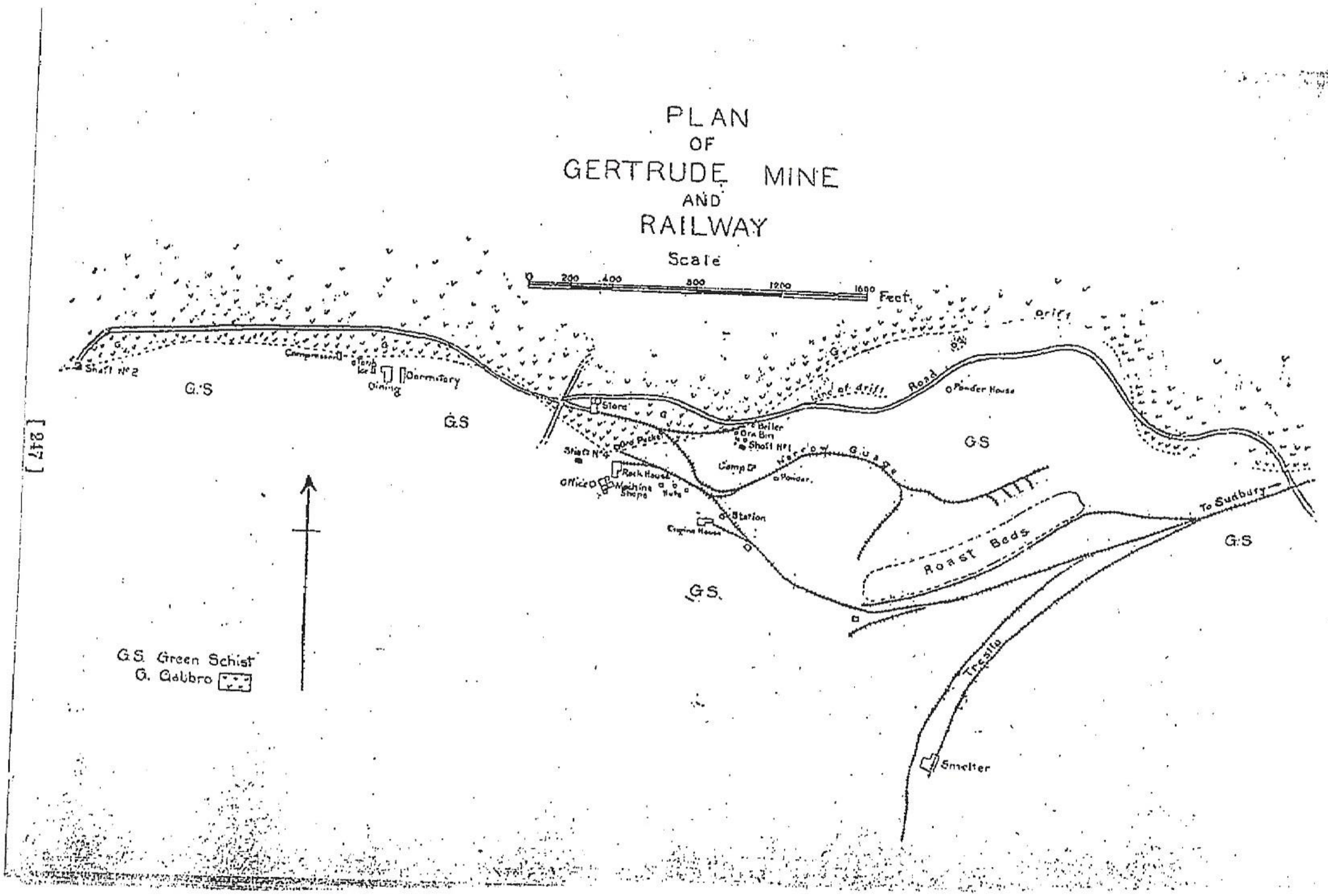
The Creighton Mine.

The Creighton mine is situated at the southern end of the line between Creighton and Snider townships, in lot 10 of the first concession of the latter township, about eleven miles west of Sudbury by the Manitoulin and North Shore railway. One of the Salter's old meridian



lines runs close to it or through it, and the ore body was really discovered by Murray in 1855, forty-five years before it was opened up as a mine.[18] Salter had found great magnetic disturbance at a point on his line about five miles north of Whitefish lake; and Murray examined

[18] Geol. Sur. Can., 1853-56, p. 180. (Prof. Miller has been good enough to call my attention to this reference in Murray's report).


PLAN
OF
GERTRUDE MINE
AND
RAILWAY
Scale
0 200 400 800 1200 1600 Feet
Shaft No 2
G.S
Compressor
Dormitory
Dining
G.S
Store
Boiler
Ore Bin
Shaft No 1
Camp
Powder
Station
Engine House
Rock House
Office
Machine Shops
Line of drift
Road
Powder House
Narrow Guage
G.S
Roast Beds
To Sudbury
G.S
G.S.
Trestle
Smelter
drift
G.S. Green Schist
G. Gabbro

latter are often somewhat fractured, the fissures being filled with the sulphides. The appearance almost suggests that the fused sulphides had penetrated fissures in the already cold porphyrite; but no doubt the deposition of the pyrrhotite and chalcopyrite was from aqueous solutions after the somewhat rapid cooling and cracking of the surface of the eruptive. There has been a certain amount of faulting since the dikes occupied their places, for they are somewhat broken and slickensided, and fissures opened thus in the ore body must have provided channels in which solutions could circulate. Occasionally thin films of the sulphides lie between the slickensided surfaces. It is likely that the brecciated norite and also granitoid gneiss with sulphides cementing the fragments have been crushed in such earth movements; perhaps, however, at the time the fissures were opened to allow the molten porphyrite to ascend as dikes, and not in later times when the dike rocks themselves were fractured.

The granite sometimes has drusy holes with fairly large feldspar crystals, quartz, fluorite and copper pyrites. The purple fluorite in the pegmatitic streaks of the granite is suggestive of active mineral-forming agents as in ore-bearing veins. How the sulphides became disseminated through the ordinary granitoid gneiss is not clear, unless by replacement of part of the minerals of the granite when the norite with its sulphides came in contact with it. That the gneiss was present in a cold and solid state before the eruption of norite and ore, seems proved by the facts that the norite grows finer-grained against the gneiss, and that in places solid pyrrhotite rests against a clean foot wall of gneiss without evidence of infiltration.

The gneiss forms an irregular cavity or pocket for the ore mass. As the map indicates, there is a sharp bend of about 100° in the boundary of the granite where it meets the ore, and about 100 feet northwest of the angle a projection of gneiss pushes southwest, still further hemming in the sulphides. The contact of the two is not far from vertical in some places, but in others the walls of the pit show a dip of about 45° in the surface of the gneiss, as may be seen on the southwest side.

Drill holes sunk at various points give some additional information regarding the shape of the trough enclosing the ore. Drill hole No. 3 near the northwest side of the stripping shows 40 feet of ore followed by granite; No. 2 shows only 20 feet of mixed ore before granite is reached. No. 4, which is near the edge of the pit just opposite the foot of the inclined shaft, penetrated 177 feet of ore before entering granite. No. 1, which is about 100 feet southwest of No. 4, showed 250 feet of ore; and No. 5, about 160 feet northwest of No. 4, had gone through 15 feet of "capping" and 111 feet into ore at the time of my examination on 8th July.

The drill holes indicate that the floor of gneiss (or granite as reported by the drillers) slopes toward the west at an average rate of about 40°. Further work will of course give much fuller information regarding the shape of the immense ore body and its relations to the adjoining rocks. There is a good probability in favor of the opinion of experienced prospectors that large ore bodies are more likely to occur at sharp angles of the granite or gneiss than elsewhere. It will be shown later that this arrangement occurs at other points.

The ore at the Creighton mine is richer than usual, containing, it is said, from 6 to 10 per cent. of nickel and copper with much more of the former metal than of the latter.

The Gertrude Mine.

About 400 yards west of Creighton station, the gossan hill extending southwest of the mine dips down into a low swampy region and is lost. About 20 paces farther west the contact of the norite or gabbro with the Laurentian crosses the track, having a direction of 60° west of south, as seen on a small exposure of rock rising out of a muskeg. Beyond this, about 120 yards, a low ridge of gabbro is cut by the railway, but the next outcrop of rock, at the pumping station, is not gabbro, and no more is seen until the Gertrude mine is reached a little

PASSENGER AND FREIGHT CRASH ON ALGOMA EASTERN

Two Veterans of the Road Lose Their Lives

The most serious wreck in the history of the Algoma Eastern Railway, which connects Sudbury with Little Current on Georgian Bay, occurred Monday noon last, at 12.50, when No. 1 the regular westbound passenger train met in a headon collision with extra No. 54, eastbound at a point two miles west of Birch Island and about eleven miles east of Little Current. The trains met at a curve, travelling at from 20 to 25 miles an hour, which is scheduled running speed at this point, and the engine crews had only a moment's warning—less than a pole length away—when the crash came. Four of the six who were riding in the cabins of the respective locomotives at the time of the collision saved their lives by jumping. The two who remained, or hesitated, or were unable to find an opening in time to jump were killed. These with the list of injured, are

Dead

WILLIAM DUNN, Sudbury, conductor on the passenger.

ARNOLD NOBLE, formerly of Sudbury, section foreman at Birch Island.

Injured

JOHN M. WRIGHT, Sudbury, engineer on the passenger, collar bone broken, shoulder dislocated.

THOMAS WILLIAMS, Little Current, engineer on the freight, shoulder dislocated.

J. ADAMS, Little Current, fireman on the freight, cut about head, not serious.

LEONARD PAUL, Sudbury, fireman on passenger, shoulder dislocated.

C. HARRIS, despatcher, Sudbury, shoulder dislocated.

This is the first accident to a train on the Algoma Eastern Railway that has resulted in the death of an employee, or injury to a passenger, in twenty-five years of railroading. The accident is the most regrettable, was avoidable. The human element failed, in that one of the crews overran their orders. As the forthcoming investigation is expected to disclose. A feature of the wreck is that no passengers were seriously injured, and that the fatalities and injured are confined to company employees.

The engines were manned by senior men of long experience. Engineer Wright has been at the throttle for twelve years and Engineer Williams for twenty-four years.

The loss to rolling stock is expected to reach $100,000. This loss is confined solely to the engines, tenders, baggage car and freight equipment. The day

(Continued on Page 3)

THE ALGOMA EASTERN RAILWAY.

REPORTING MARKS—"A E R"

GENERAL OFFICERS.

G. A. Montgomery, President.. } Sault Ste Marie,
W. C. Franz, Vice-President.... } Ont.
E. B. Barber, Comptroller.......... "
E. E. King, Assistant Comptroller. "
Alex Taylor, Secretary..........Toronto, Ont.

J. M. Alton, Treasurer........ } Sault Ste. Marie,
H. Hoodless, Auditor Traffic } Ont.
Accounts.............. "
H. P. McKeown, Purchasing Agent..Sudbury, Ont.

J. P. Mader, Gen. Freight & Passenger Agent...............Sudbury, Ont.
F. M. Donegan, Superintendent.... "
W. M. Hugill, Superintendent Car Service.........Sault Ste. Marie, Ont.

GENERAL OFFICES, SUDBURY, ONT.

Miles of road operated, 87. Gauge, 4 ft. 8½ in. Locomotives (coal burning), 8. No sleeping cars operate over this line. British America Express Company operates over this line. Limit of load and marked capacity—Algoma Eastern cars stencilled with "Total Weight," must not be loaded in excess of the figure shown. Cars not so stencilled may be loaded in accordance with notes "A" and "B." Maximum gross weight of car and lading permitted to pass over this line, 200,000 pounds.

FREIGHT EQUIPMENT.

Reporting Marks—"A E R"

The freight cars of this Company are marked "Algoma Eastern," and numbered and classified as follows:

M. C. B. Designation.	Markings and Kind of Cars.	Numbers.	Dimensions, Inside: Length (ft. in.)	Inside: Width (ft. in.)	Inside: Height (ft. in.)	Outside: Length (ft. in.)	Outside Width: At Eaves or Top of Sides or Platform (ft. in.)	Outside Width: Extreme Width (ft. in.)	Height from Rail: To Extreme Width (ft. in.)	Height from Rail: To Eaves or Top of Sides or Platform (ft. in.)	Height from Rail: To Top of Running Board (ft. in.)	Height from Rail: To Extreme Height (ft. in.)	Doors, Side: Width of Open'g (ft. in.)	Doors, Side: Height of Open'g (ft. in.)	Doors, End: Width of Open'g (ft. in.)	Doors, End: Height of Open'g (ft. in.)	Capacity: Cubic Feet Level Full	Capacity: Pounds or Gallons	Number of Cars
XM	Box, Steel Frame, Note A	351 to 375	36	8 6	8	36 8	9 7¾			12 7½	13 4½	14	6	7 6	1 11	3	2448	80000 lb.	18
FM	Flat, Wooden, Note B	601 to 648	40	9		40	10			4 0¼								80000 lb.	40
FM	" Wooden, Note B	728	40	9		40	10			4 1¾								80000 lb.	1
FM	" Steel Underframe, Note A	901 to 924	40	8 11		40	8 11			4 2¾								80000 lb.	22
HT	Ore, Steel, Note A	2201 to 2214	20 6½	7 5	7 6	22 6	8			9 9		9 9					618	100000 lb.	14
GA	Gondola, Steel Frame, Note A	2301 to 2370	36 5	9 7	4 6	38 9	9 6					8 11					1584	100000 lb.	44
	Gond., Steel Frame, Permanent Coke Racks, Notes A, C	" "	"	"		"	"					"						"	25
GA	Gondola, Steel, Note A	2801 to 2925	22 5	9 6	5	24 4½	9 11					9 5					1026	100000 lb.	125
GD	" Wood, Note B	5103, 5104	38 10	8 8	4	40	10 1					8 10					1334	80000 lb.	2
HM	Ore, Wood, Note B	1603 to 1607	19	7 11	7	21 4	9			9		9					587	100000 lb.	2
	Total																		293

RECAPITULATION OF CAR EQUIPMENT.

FREIGHT.

Plain Box (XM)—
Cars of 80,000 lbs. capacity.. 18
Total Box (All Class X and Class V cars, except XT)—
Cars of 80,000 lbs. capacity.. 18
Gondola, Flat Bottom (GB, GK, GM, GT)—
Cars of 80,000 lbs. capacity.. 2
Gondola, Side Dump (GD, GS)—
Cars of 100,000 lbs. capacity.. 194
Hopper (HD, HM, HT)—
Cars of 100,000 lbs. capacity.. 16

Total Open Top Cars (Includes all Class G and H Cars)—
Cars of 80,000 lbs. capacity.. 2
Cars of 100,000 lbs. " .. 210
Flat (All Class F cars)—
Cars of 80,000 lbs. capacity.. 63
Total Revenue Freight Equipment—
Cars of 80,000 lbs. capacity.. 83
Cars of 100,000 lbs. " .. 210
Non-Revenue Freight Equipment—
Caboose.................... 8
Miscellaneous Maint. of Way 10

Total Freight Equipment Cars.................. 311

PASSENGER.

Coaches.............................. 8
Comb. Passenger & Baggage.... 1
Baggage.............................. 1
Total Passenger Equipment Cars.................. 5

GRAND TOTAL Freight and Passenger Equipment Cars........... 316

POUNDS CAPACITY OF FREIGHT CARS—AGGREGATE AND AVERAGE.

Box Cars.

	No. of Cars.	Aggregate Capacity.
80,000 lb.	18	1,440,000 lb.
Total.......	18	1,440,000 lb.

Average Capacity per Box Car.................. 80,000 lb.

Other Cars.

	No. of Cars.	Aggregate Capacity.
80,000 lb.	63	5,040,000 lb.
Total.......	63	5,040,000 lb.

Average Capacity per Car.................. 80,000 lb.

Open Top Cars.

	No. of Cars.	Aggregate Capacity.
80,000 lb.	2	160,000 lb.
100,000 lb.	210	21,000,000 lb.
Total.......	212	21,160,000 lb.

Average Capacity per Car.................. 99,811 lb.

Total Revenue Freight Cars.

	No. of Cars.	Aggregate Capacity.
80,000 lb.	83	[illegible] lb.
100,000 lb.	210	21,000,000 lb.
Total.......	293	[illegible] lb.

Average Capacity per Car.................. [illegible] lb.

FREIGHT CONNECTIONS AND JUNCTION POINTS.

Canadian National—
Sudbury, Ont..............................

Canadian Pacific—
Espanola, Ont..............................
Sudbury, Ont..............................

PASSENGER EQUIPMENT.

M. C. B. Designation.	Kind	Series of Numbers.	Seating Cap'cty	Length of Car.	No.
PA	Passenger	71, 72	Under 70	60 ft. & under 70 ft.	2
PB	" 2d-Class	81	70 to 86		1
CA	Combination	52	Under 70	60 ft. & under 70 ft.	1
	Baggage	151		60 ft. & under 70 ft.	1
	Total				5

Note A—The cars in this series may be loaded to axle carrying capacity in accordance with A. R. A. Rule 86.

Note B—The cars in this series must not be loaded in excess of 10 per cent above the marked nominal capacity.

Note C—Individual numbers of cars in series 2301 to 2370 equipped with permanent coke racks:

2303 2305 2313 2316 2317 2321 2332 2336 2337 2339 2341 2342 2345 2347 2352 2353 2357 to 2360 2362 2363 2366 2367 2370

Do not confuse cars of this Company with those of the Arizona Eastern R. R. Co.

Detailed Instructions for Rendering Reports and for Settling Mileage or Per Diem and Repair Accounts.

REPORTS OF MOVEMENTS.

Report movements to W. M. Hugill, Superintendent Car Service, Sault Ste Marie, Ont.

MILEAGE OR PER DIEM REPORTS.

Send mileage or per diem reports to W. M. Hugill, Supt. Car Service, Sault Ste Marie, Ont.

BALANCES.

For balances remit to J. M. Alton, Treasurer, Sault Ste. Marie, Ont.
Draw on E. B. Barber, Comptroller, through Bank of Montreal, Sault Ste Marie, Ont.

REPAIR BILLS.

Send bills for repairs to cars to W. M. Hugill, Supt. Car Service, Sault Ste Marie, Ont.

REQUISITIONS FOR MATERIAL TO REPAIR.

Send requisitions for material to repair to F. M. Donegan, Superintendent, Sudbury, Ont.

CARS RE-LIGHTWEIGHED ON FOREIGN ROADS.

All reports of cars re-lightweighed and stencilled on foreign roads should be sent to W. M. Hugill, Supt. Car Service, Sault Ste Marie, Ont.

EMBARGOES.

For application of embargoes under Per Diem Rule 16 see Embargo Regulations and instructions issued by American Railway Association.
Address embargo notices, embargo reclaims and notices of cars held under Per Diem Rules to J. P. Mader, Gen. Freight and Passenger Agent, Sudbury, Ont.

Ontario Sessional Papers

cent. This is partly due to the fact that the ores of Mond Nickel Company are lower in sulphur, and partly to the fact that this company carries out a modified pyritic smelting.

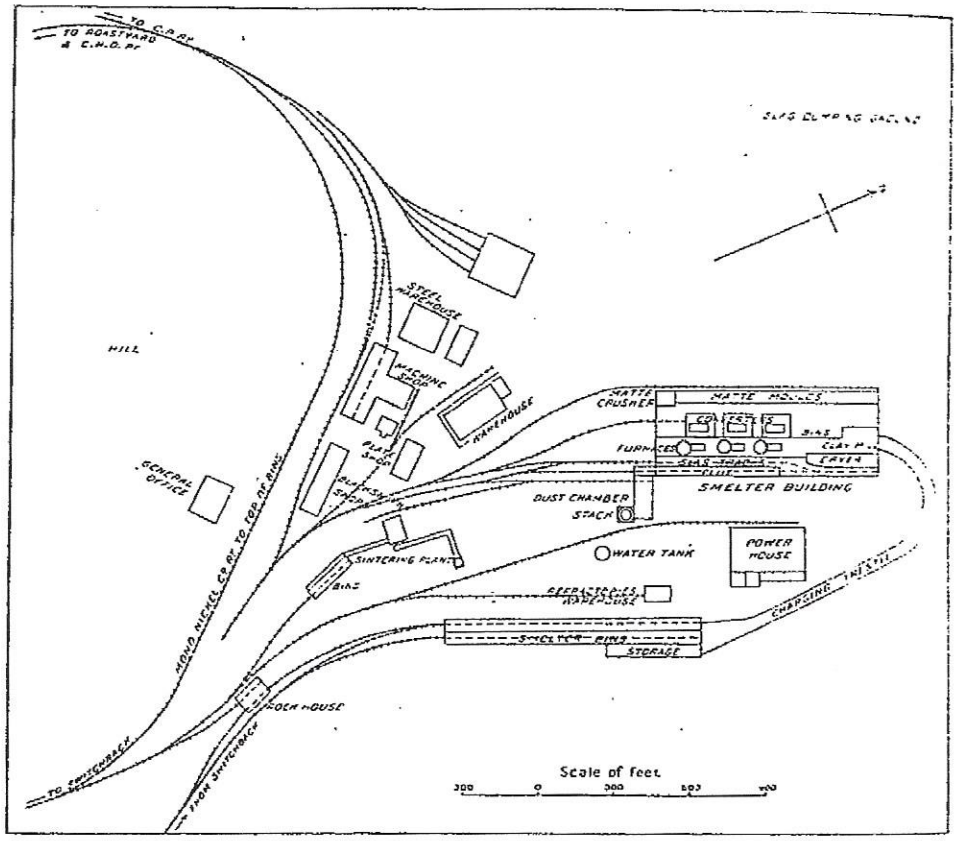
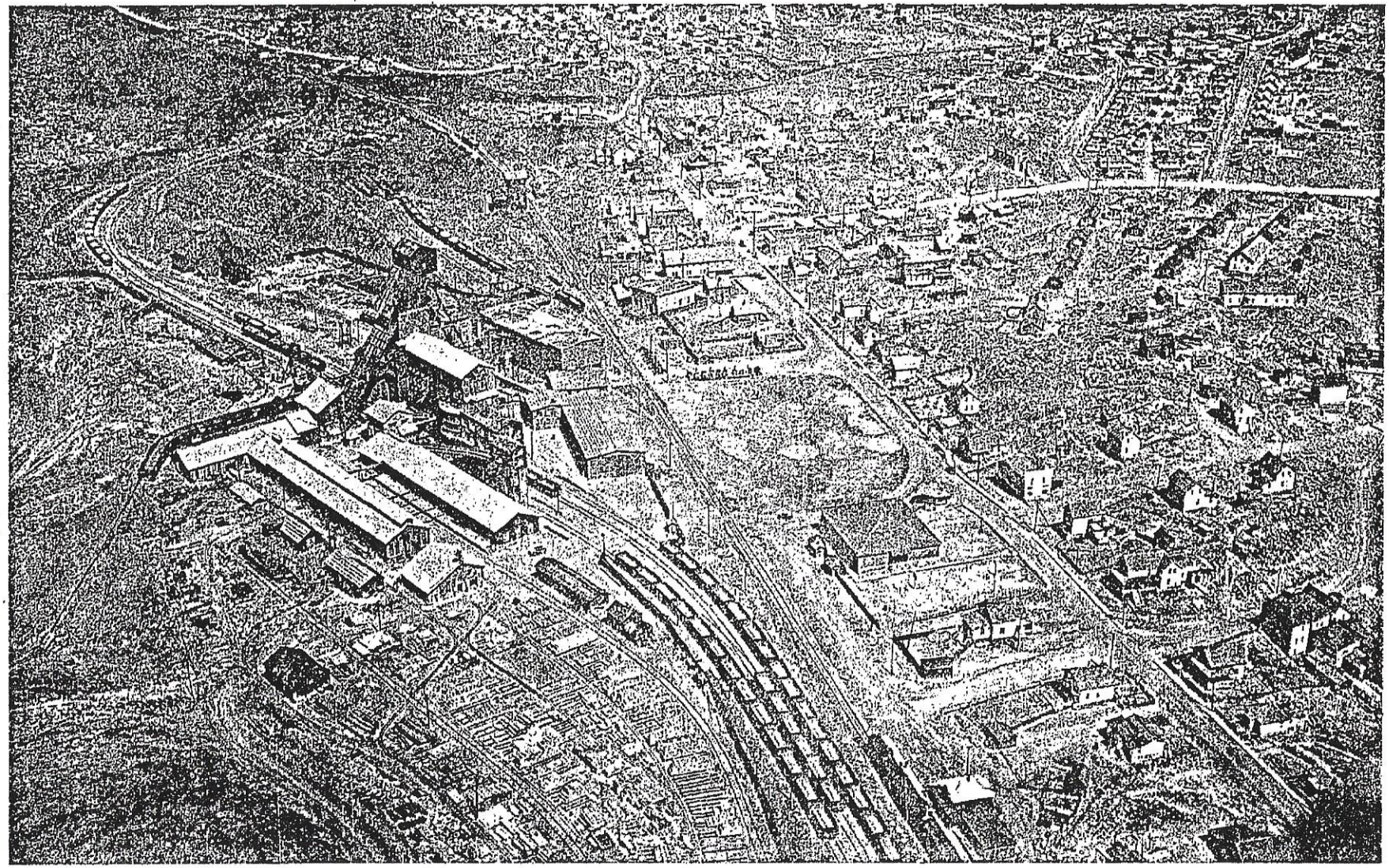


Fig. 79—Plan of Smelter and Adjacent Buildings, Mond Nickel Company, Coniston, Ontario.

A typical charge at Coniston would be:—

Roasted ore and sinter	10,000 lbs.
Raw ore	8,000 "
Scrap	2,000 "
Limestone	2,200 "
Total	22,200 "
Coke	2,200 "
	24,400 "



Creighton mine.

Ontario Sessional Paper

The converter slag, averaging 1 per cent. copper and 3 per cent. nickel, was formerly re-smelted in the blast furnace, but is now merely poured into the settlers. Since the slag going to the dump only carries 0.16 per cent. copper and 0.32 per cent. nickel, the efficiency of the settling process is obvious.

Fig. 76—Pouring Slag on Dump, Canadian Copper Company, Copper Cliff, Ontario.