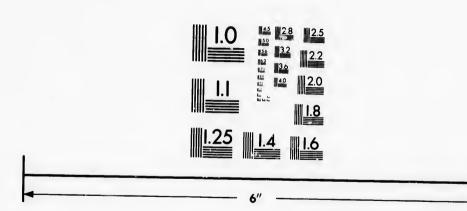


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Low Phosphorus Bessemer Ores

SNOWDON IRON MINES.

T. D. LEDYARD,

Dealer in Mines,

TORONTO, CANADA.

IMRIE & GRAHAM, Printers, 28 Colhorne St., Toronte

100 × 300

BESSEMER IRON ORES.

LOW IN PHOSPHORUS.

In the Township of Snowdon, County of Haliburton, Ontario, there is an ore range containing deposits of magnetic iron ore, particularly low in phos-

Lots 25, 26 and 27, in the 4th Concession of Snowdon, on the South side of the Burnt River, contain several outcrops of magnetite extending about three-

This ore is on high ground, overlooking the Burnt River and the railway track, and most conveniently situated for mining by drifts or tunnels run into the hill-side, the mine cars to be run by gravity to the shipping platforms or pockets at the railroad.

This property is about 220 miles by rail from Buffalo, N. Y., to which Location point the ores could be delivered very cheaply in returning coal cars. Or the ore could go by rail to Toronto, 110 miles, or to Whitby or to Port Hope, Ontario, ports on the north shore of Lake Ontario, and thence by boat across the tario, ports on the north shore of Lake Untario, and thence by boat across the lake to Charlotte, Sodur Point, Fairhaven or Oswego, N. Y., from which points the fellowing railways run into Pennsylvania, viz., "The Rochester, Buffalo & Pittsburgh Railway" from Charlotte, N. Y.; "The Northern Central" or Pennsylvania Ry., from Sodus Point, N. Y., "The Lehigh Valley Ry." from Fairhaven, N. Y., and "The Delaware, Lackawanna & Western Ry." from Oswego.

Cheap freight can be got from Canadian ports for iron ore in coal vessels

which usually return empty across the lake.

These deposits are not more than 100 miles from Midland, Ont., on the Georgian Bay, whence ore could be snipped by boat to Chicago, in returning grain vessels at low rates.

Limestone suitable for flux is found in close proximity to the ores, and there is abundance of hard-wood suitable for charcoal.

There is also brown hematite in the neighborhood, yielding 45 to 48 per Charcoal cent. metallic iron, which would mix well with the magnetic ores in a charcoal furnace. furnace.

The magnetic ores are so favorably situated for mining, and labor and supplies are so cheap, that it should not cost more than \$1.25 to mine and load them on the cars.

The freight by rail to Buffalo (220 miles) should not exceed \$1.25 per ton, making very cheap Bessemer ore delivered in Buffalo.

The freight to Toronto (110 miles) should not exceed 75c., so that a furnace in Toronto owning these mines could get their ore for \$2 per ton.

Hamilton, Ont., is within 150 miles of these ores by rail. There are great inducements at the present time for the erection of a blast furnace either at Toronto or Hamilton.

The Dominion Government offer a cash bonus of \$2 per ton for every ton of pig-iron manufactured in Canada from Canadian ores up to 1st of January, 1898, while there is a protective duty of \$4 per ton. Coke from Connellsville, Pennsylvania, could be delivered as cheaply as to Chicago, and ores could be obtained at remarkably low rates.

Coke furnace.

The Government of Ontario is anxious to have the iron ores of the Province developed, and would encourage and probably assist the first furnace which would be started to smelt such ores, while either of the cities, Toronto or Hamilton, would, no doubt, remit the taxes on such an enterprise for a certain time, and might give more substantial aid.

The City of Hamilton, Ont., claims special advantages for a Blast Furnace, one being that of having a very cheap supply of limestone suitable for flux.

There is not at present any blast furnace in operation in the Province of Ontario, which contains a population of over two million people, and there should be ready sale for the out-put of a furnace producing 150 tons of pigiron daily.

The following experts' reports have been made on the Snowdon iron properties:

REPORT ON SNOWDON IRON MINES, HALIBURTON COUNTY, ONT.

By Prof. C. Gordon Richardson, of Toronto.

Toronto, Ont., August 1st, 1891.

T. D. LEDYARD, Esq.,

57 Colborne Street, Toronto,-

DEAR SIR: In accordance with the instructions received from yourself, to examine the Snowdon Iron property, and to report thereon, I visited the grounds upon the 25th of last month.

DESCRIPTION.

The property comprises south part Lot 25 and Lot 27, in the IV. Concession of the Township of Snowdon, containing about 170 acres altogether. The Monck road runs through Lot 25 and close to the northwest corner of Lot 27, as also does "The Irondale, Bancroft and Ottawa Railway," under construction, and completed from Kinmount, some ten miles distant to Irondale, a small village half a mile to the East of the property. At Kinmount connection is made with the Haliburton Branch of the Grand Trunk Railway. Thus an all-rail route is had direct from the property to the city of Toronto, distant about 110 miles, or to Buffalo, N.Y., about 220 miles.

GEOLOGICAL FEATURES.

The country rock consists essentially of micaceous and hornblendic gneiss, dolomite and crystalline limestone, with a massive dyke of diorite, crossing both lots from southwest to northeast, conforming in this respect to the general strike of the limestones and gneiss. With perhaps the exception of this diorite, the whole may be referred to the Laurentian series. These rocks form a bold precipitous bluff about 150 feet in height, at the foot of which the railway and Monck road pass, together with the Burnt River, a tributary of the Gull waters.

Several well-defined outcrops of magnetite occur in the diorite, and may he easily traced across both lots, 25 and 27, together with 26, the lot intervening. The ore is finely granular, and not too dense in texture, and on 25, and especially 27, seems free from sulphur, and is certainly low in phoshorus while, owing doubtless to the proximity of the intercalated beds of limestone, it will be found inclined to be free fluxing in the furnace. On the intervening lot, No. 26, a shaft has been sunk, which in the higher levels showed consid-

erable quantities of sulphur; but this is, in my opinion, purely accidental, being confined to a single lense of ore, and not characteristic of the series as a whole, the ore from lower depths here being said to be much freer from sulphur; the shaft was unfortunately located upon the only spot where strong sulphur indications could be seen.

The ore deposit is evidently a "contact" one and occurs in irregular "stock werkes" and narrow lenticular masses, whose greatest diameter lies parallel to the strike of the country rock, and with an underlie towards the east. These masses vary from ten to fifty in width and possess considerable length, forming an irregular band of lenses crossing the three lots. Little work beyond a few trial pits has been done upon Lot 27, but there is every indication of the existence of a strong body of ore of excellent quality, being very low in phosphorus and quite free from titanium. Upon 25, numerous pits have been sunk, all showing well; while upon the southwesterly extremity of the lode a small shaft, from which some 200 tons of ore have been taken for shipment, has been opened. The ore here is of excellent quality, very free from sulphur and containing only traces of phospho us.

As to the probable quantity of ore present, it would be unwise to base any estimation upon the behavior of the needle, as, owing to the lenticular shape of the ore masses, the magnet shifts very rapidly. Still, numerous points occur where the needle dips from 45 to 90 degrees over very considerable

areas, notably these referred to as existing upon Lot 27.

Apart from the needle indications, there is every reason to look for permanency in the deposits. They will undoubtedly be continuous with the diorite, and this has great depth. The ore deposits on these three lots, 25, 26 and 27, are found running in a direction northeast by southwest for a distance of about three-quarters of a mile on high ground, favorably situated for mining.

In opening this property I would strongly urge the advisability of using the diamond drill for mapping out the general character of the deposits; and while this was in progress, open cut-work might be undertaken in two or three

spots, as indicated by the small pits already in existence.

In conclusion, let me state that both from its very advantageous position for working and shipping and general indications of ore in large quantity and good quality, this property is, in my opinion, a most promising one, and well worthy of the attention of those interested in the development and working of Bessemer ores. I am sincerely yours,

C. GORDON RICHARDSON,

Lecturer on Chemistry,

Ontario Vet. College, Toronto.

The following analyses have been made of ore from this property—the first by Professor E. J. Chapman, of Toronto, being from Lot 26; and the three last from Lots 25 and 27, viz:

| No. | Metallic Iron. | Phosphorus. | Sulphur. | Silica. |
|-----|----------------|-------------|----------|---------|
| ī | 61.48 | 0.01 | 0.16 | |
| 2 | 62. | Trace. | 0.025 | 1.7 |
| 3 | 62.57 | 0.025 | Trace. | • |
| 4 | 63. | Trace. | 9 925 | 3.1 |

Concerning Analysis No. 1, Dr. E. J. Chapman. Professor of Geology and Mineralogy in Toronto School of Science, says: "A fine grained magnetic ore from the Howland mine (Lot 26, in 4th Concession, Snowdon); the ore near

the surface is very pyritous, but becomes almost free from pyrites in descending. The sample was taken from a depth of 81 feet from the surface. A second shaft has been sunk on another part of the deposit to a depth of about 30 feet. The deposit is apparently an elongated steck-formed mass of large

REPORT ON SNOWDON IRON MINES

By Charles Simmons, C. E. & M. E.,

Roard of Trade Building,

Toronto, Ont., December 1st, 1891.

T. D. LEDVARD, Esq.,

Toronto.

DEAR SIR :-- Having at your request made a minute examination of your iron properties in the Township of Snowdon, Ontario, I beg to submit the fol-

lowing as my report thereon.

The locations where mining operations are in progress at the present time are Lots Nos. 25 and 27, in the 4th Concession, and with the intervening lot 26 they form a portion of the escarpment or outlaying spur of the hills overlooking the Burnt River where it emerges from the long and narrow Devil's Lake. These lots are each 20 chains in width by 50 chains long, and contain 100 acres each.

LOCATION.

The general plan attached hereto shows the position of Snowdon, and the most important distributing points in Ontario in relation to the great industrial centres in the United States. It will be seen that the properties are very advantageously placed in regard to means of shipment of ore to any desired point; the line known as "The Irondale, Bancroft & Ottawa Railway," in fact, passes through Lots 25 and 26, and ir front of Lot 27, within a few hundred feet of the various ore bodies, to which easy access may be had by means of tramways or waggon roads.

NATURAL FEATURES.

The hills, which may be described as having a general sweep or trend north east and southwest, rise somewhat abruptly from the river to a height of about 150 feet. They consist for the most part of rocks of the Laurentian series, gray, foliated, gneiss, dolomite, and crystalline limestone, and in places bands of soap-stone. The iron ore, which is a magnetite of singularly pure quality, finely granular and crystalline, is associated invariably with bands or dykes of Huronian diorite, which are found crossing the lots in conformity with the trend of the strata. Speaking generally, the formation may be considered as exceedingly favorable to the existence of iron ore in large bodies.

The various deposits shown on the ground plan of the lots are numbered consecutively in the order in which they were visited; the dimensions stated are from actual measurement and indications of the "dip" needle.

No. 1.—At this point a shaft is being sunk near the centre of a deposit, which had been located by the needle, the attraction being particularly strong, showing fully 90 degrees over an area 70 feet by 60 feet. The shaft which is now 11 feet deep, was sunk through a capping 7 feet thick of blackish green diorite, extremely hard and massive, and resulted in the finding of a body of magnetite, which even at this shallow depth, gives excellent promise of developing into a substantial deposit of clean solid ore.

No. 2.—A short distance northeast of No. 1, an excavation was made to a depth of 10 feet, showing the existence of magnetite, the needle attractions being unmistakeable.

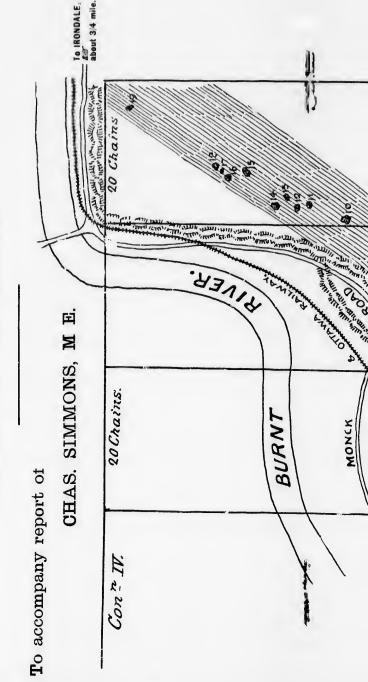
Lot 25.

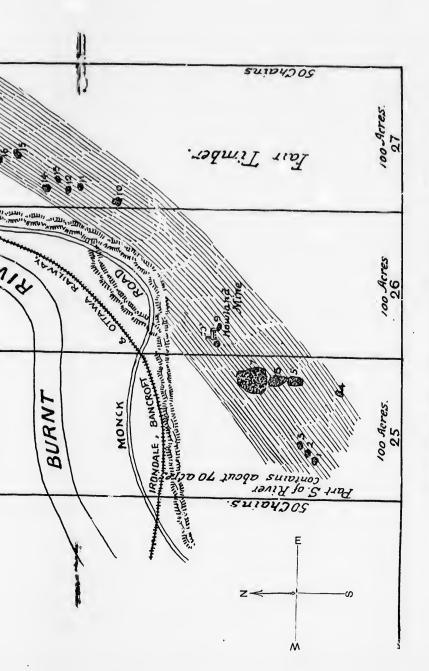


PLAN OF LOT'S 25, 26 and 27, Con. IV.,

Township of SNOWDON, ONT.

SHEWING IRON ORE DEPOSITS.





NOTE.—Needle attractions over ore beds shown thus....

Strike of Diorite rock (Mine rock)......

These Iron deposits are about 110 miles N. E. of Toronto and are reached by the Grand Trunk Ry., (Midland Branch). For T. D. LEDYARD, Toronto.

nd



No. 3.—Still in the direction of northeast, in close proximity to No. 2, following the ridge, the needle showed an attraction verging on 90 degrees for a length of 50 feet by a breadth of 15 feet. Nos. 1, 2 and 3 cover a length of 250 feet, and being so contiguous, and with more or less of indications between, lead to the belief of a continuous deposit.

No. 4.—This is an outcrop towards the south boundary of Lot 25, upon which some little work had been done, proving the existence of magnetite, more or less mixed with gangue. It is apparently in the nature of a chimney or blow off, the enclosing rocks showing signs of local disturbance.

No. 5 .- This point is of particular interest, as being the site of former prospecting. At that time the rock was pierced to a considerable depth by the

diamond drill, the holes being still intact.

It was stated that the cores extracted showed that the drill had passed, drilling, through sixty feet of solid ore of very excellent quality. The needle attraction here was very strong, 90 degrees, extending over an area over 40 by 20 feet. The ore as seen in the surface working was a good appearance, being finely granular but not excessively dense, and is free from any trace of

No. 6.—This is a pit sunk about 14 feet in rotten diorite. The attraction extends over a breadth of 25 feet, being practically a continuation of No. 5, making the total length 300 feet, the needle indicating 90 degrees throughout. There is undoubtedly a fine body of ore at this point.

No. 7.—This is one of the most important discoveries on Lot 25. The needle attractions were apparent over the whole of the large irregular area shown on the plan, being some 240 feet in diameter, the attraction being from 40 to 90 degrees. The ore outcrops in places, and is here associated with diorite, with a capping of gneiss and diorite. The extension of No. 6 runs into No. 7, and the diamond drill test referred to therefore gives reasonable assurance of the value of this large ore deposit.

No. 8.—At this point a considerable amount of work has been done, a shaft being sunk on a fine body of ore found outcropping on the surface. A shipment was made from this point of some 200 tons, the quality proving to be eminently satisfactory, the ore being almost absolutely free from sulphur, and according to the analysis of the chemist at the furnace, the phosphorus

No. 9. -On lot 26 the only point to which prospecting or mining operations Lot 26, Howland have been directed, is that known as the Howland Mine. The writer examined mine. these workings previously in the interest of the owner, at which time they consisted of an inclined excavation or drift and a main vertical shaft, the latter sunk to a depth of 85 feet.

The vein or ore bed was found outcropping at the surface where the present workings are located, and subsequently a second outcrop was said to have been discovered by means of a "dip" needle, at a distance of about 200

yards northeast.

The deposit as seen in the underground workings, follows the trend of the

limestone ridges and the country rock northeast and southwest.

The ore body, which here also is associated with diorite, has an underlay south 15 degrees from the vertical. The shaft was sunk on the foot wall, but the opposite or hanging wall was not reached, although the vein was crosscut a distance of 30 feet, some 40 feet below the surface. For the whole depth of 85 feet the shaft is through a mass of ore ground.

The quality of the ore in the Howland Mine chemically is of great excellence, but the extension of bands or layers of ore impregnated with pyrites necessitates great care in selecting it for shipping purposes. Judging, however, by the indications and the lessening proportions of the pyrites in the lower workings, it is probable that this will prove to be merely a local defect, which with increased depth will be entirely eliminated. As a matter of fact the pyritous ore is not disseminated but is in distinct bands, so that even now there is a considerable proportion of excellent quality available for shipment,

Lot 27.

No. to.—This was the first point inspected on Lot 27, and consisted of a shallow opening, which at a depth of six feet disclosed a solid body of ore somewhat mixed with rock. The nature of this deposit and the enclosing rock, which is a well stratified diorite having distinct vertical walls and bed joints, combined with the very decided needle attractions (being 90 degrees over an area 50 by 20 feet), indicates it to be one of decided and permanent importance, and is probably an outlyer of the range or series of deposits next to be noticed.

Nos. 11, 12 and 13.—These are areas of attraction which, although limited in extent, are of undoubted importance in establishing the sweep or trend of the ore ground and its relation to the zones or dykes of diorite traversing the lots. The average diameter of the indications at these points is about 12 feet, the attraction being 90 degrees probably over the apex of chimneys of cone-shaped masses, ascending from a main body of ore.

No. 14.—At this point, known as the pine stump, there are excavations disclosing ore of a very fair grade. The needle attractious extend over an

elongated area 48 feet by 12 feet.

No. 15.—This working is a few feet deep, uncovering the ore which seems to open out downward into a heaped or cone-shaped mass. The needle attractions cover an area of 22 feet by 14, being 90 degrees over the centre and diminishing outwards towards the circumference.

No. 16.—This is a small opening showing an excellent quality of magnetic iron ore, finely granulated and free from rock matter. The needle attraction

here ranges from 80 to 90 degrees over an area 20 feet by 6 feet.

Nos. 17 and 18.—Openings were made at these points from needle indica-

tions, the ore being found at shallow depths below the surface.

No. 19.—This last point examined was an outcrop of ore on the extreme northeast corner of Lot 27, on the face of the precipitous bluff overlooking the Burnt River. The ore is of excellent quality, and extensive shipments might easily be made. The presence of small particles of pyrites noticed are scarcely worthy of mention, the quantity being insignificant. This and the Howland Mine are the only points where traces of sulphur or pyrites were seen.

Conclusions.

In further considering the subject, the writer would direct attention to the excellent natural facilities for carrying on extensive mining operations at a minimum cost, particularly on Lot 27, where the deposits occur along the highest part of the slope, than which in regard to underground drainage and the transportation of ore to a railway, no more favorable location could well be chosen. In regard to the quality and quantity of ore, the first point may be answered by referring to the accompanying analyses, the main feature being the freedom from phosphorus, rendering the ore suitable to make the finest steel. The second point is not so easily decided, but enough is known to make it reasonably certain that the iron ore deposits in this region will afford ample scope for mining and a production limited only by the demand.

Depth of ore

The general trend of these ore deposits is northeast and southwest, similar to that of most of the best magnetic ore mines of New Jersey. The fact also that good ore has been found wherever there are needle attractions, is a proof of the success of the prospecting and developing operations. With regard to deep working and continuance of the deposits, it is worthy of note that the Howland Mine, where they have a shaft 85 feet deep, and are still in solid and improving ore-ground, was located on a small outcrop where the needle attraction was comparatively insignificant. The wide areas of attraction enumerated above, and their strength and tenacity, are evidences of the value and extent of these deposits; and they most assuredly warrant the outlay of capital in their thorough exploitation or development, with the view of establishing permanent mining operations.

Respectfully submitted.

(Signed) CHARLES SIMMONS,

Civil and Mining Engineer.

These properties will either be leased on royalty on reasonable terms to Lease or sale. good parties who will undertake to work them on their merits for all they are worth, or if preferred, they will be sold outright at a less price than it generally costs to connect an iron mine with a railway, these mines already having a railway running to them.

BELMONT MINE.

As an evidence of the value of some Ontario ores, the following particulars Belmont iron regarding the Belmont iron mine may be stated. This mine is situated about 110 miles east of Toronto, near the Canadian Pacific Railway, and the Central Ontario Railway. It was leased in 1891 to "The Belmont Bessemer Ore Co.," 29 Broadway, New York, who have an authorized capital of \$600,000. This Company have proved the extent of the ore deposit, which seems to be a large bed, by diamond drillings, cross-cuts, shafts and strippings, and are now building a railway at their own expense from the mine to "The Central Ontario Railway," a distance of nine miles.

The Belmont Bessemer Ore Co. state that as soon as the railway is completed in the summer of 1892, they intend to put on a force of 500 men at the mine and make large shipments of ore. This Belmont ore is a high grade magnetite, very free from impurities and particularly low in phosphorus, as

shown by the following analyses:

| No. | Metallic Iron. | Phosphorus. | Sulphur. | Silica. |
|-----|----------------|--------------|----------|---------|
| 1 | 64.26 | Faint trace. | 0.04 | |
| 2 | 65.36 | 0.002 | Trace. | 4.5 |
| 3 | 66.29 | 0.034 | Trace. | 3.19 |
| 4 | 68.88 | 0.006 | Trace. | 3.18 |
| 5 | 68 .8 5 | 0.008 | Trace. | 1.96 |
| 6 | 69.99 | 0.012 | Trace. | 3.ío |
| 7 | 68.65 | 0.029 | 0.042 | 4.95 |
| 8 | 69.85 | 0.013 | 0.012 | 4.73 |
| 9 | 70.326 | 0.0056 | 0.0023 | 0.875 |

For further particulars, apply to,

T. D. LEDYARD,

Dealer in Mines and Mineral Lands, 57 Colborne Street,

Toronto, Canada.

