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REPORT ON MAGNETITE DEPOSITS

IN COMSTOCK DISTRICT - TASMANIA

PRELIMINARY STATEMENT:

This report was undertaken in connection with a general investigation of the iron ore resources of Austfalia under the direction of Dr. W.G. Woolnough, Commonwealth Geological Adviser. After preliminary inspections the latter recommended that a survey of certain of the Comstock deposits be made in conjunction with a sampling campaign of accessible under-ground workings. To this end three caved adits were re-conditioned, while two others were found to be sufficiently open for examination and sampling purposes. A theodolite survey of the most promising bodies was then carried out. Other iron lenses immediately west of the area examined were not included in the survey as these were considered, after inspection, to be unimportant.

The accompanying topographical and geological plan defines the outcropping iron zones and shows the mine workings in correct relation to boundaries of mineral leases. Eight plans of the underground works (13 adits) are also included. These indicate the rocks and iron lenses encountered in driving and, in the five accessible adits, the position, width and numbers of samples taken.

Information concerning the inaccessible adits was obtained from reliable miners who were engaged in driving these works, and from previous Geological Survey publications.

Sampling was carried out by Mr. T.D. Hughes of the Geological Survey Staff, who also assisted in the survey.

The assaying of samples was undertaken by the staff of the Government Chemist and Assayer.

LOCATION AND ACCESS:

Comstock Township Reserve is situated three miles west-south-west of Zeehan railway station and the iron deposits are located 1¼ miles further west on mineral leases 59M/38 to 65M/38 in the name of G. Howard.

Zeehan, the nearest settlement, is connected with the Port of Burnie, on the North West Coast, by Emu Bay railway, in a distance of 88 miles. A Government railway line also connectes Zeehan with Strahan, on the West Coast, at Macquarie Harbour, in a distance of 29 miles.

Access to the iron deposits is gained by way of Zeehan - Trial Harbour road for four miles to the crossing of Comstock tramline. The latter is followed for half a mile westerly to the terminus and thence along the Kynance tram line for 1½ miles as far as Kynance Prospecting Syndicate's mineral section (661/M). From the latter, foot tracks deviate north-westerly and south-westerly to the several iron deposits.

PREVIOUS LITERATURE: Several official reports have been published in the past in which reference is made to portions of the Comstock iron deposits. The list includes the following:-

(1)	G.A. Waller:	Report on the Iron and Zinc-lead Ore Deposits of the Comstock District, 1903.
(2)	W.H. Twelvetrees and L.K. Ward:	The Ore-Bodies of the Zeehan field. (Geo. Survey Bulletin No. 8), 1910.
(3)	L.L. Waterhouse:	The South Heemskirk Tin Field (Geo. Survey Bulletin No. 21), 1916.

TOPOGRAPHY: The area is represented by low wooded hills and ridges rising to nearly 1,000 feet above sea level and 150 feet above narrow button grass plains to the west. On west side of the latter foot-hills merge into Mt. Agnew, the south-eastern peak of Heemskirk Range, which attains a height of 2,800 feet above sea level.

Drainage is effected by means of two systems. The waters of northern part of the area flow north by way of head tributaries of Pine Creek to join Pieman River, while the southern portion is drained by Kynance Creek flowing southerly to Little Henty River.

GEOLOGY: The Heemskirk Range to the west of the area consist of a granite batholith of Devonian age. The granite intruders quartzites and slates of Cambro-Ordovician age which are on contact on the lower eastern slopes of Mt. Agnew and extend easterly into the principal locality concerned in this report. Fringing the granite within half a mile of contact, dykes of Devonian serpentine intrude the Cambro-Ordovician sedimentary rocks.

From evidence obtained in various parts of the State it is generally conceded that the acid and ultra-basic igneous rocks were drived by a process of differentiation from the one parent magma. The acid rocks, however, ascended at a slightly later period than the consolidation of the ultra-basic type.

A feature of the serpentine dykes in some localities is the distribution of masses of lime silicate hornstone or massive diopisde, along the contact of serpentine with the intruded sedimentary rock. The hornstone is dense in form and consists almost entirely of silicates of lime and magnesia with small amounts of alumina and iron. Crystalline dolomite and diopside are also present in smaller quantities. Other associated minerals consist of phlogophite (mica), talc calcite, quartz, garnet, epidote, vesuvianite, serpentine etc.

This phenomenon is apparently due to the effects of contact metamorphism and the alteration has taken place in the outer part of the dyke rocks rather than in the adjacent slates and quartzites. The contact rocks were probably formed by assimilation of material from the ultra-basic rocks and the chemical reactions by magmatic emanations, in the form of carbonated vapours and solutions, issuing from the adjacent magma, which traversed

planes of weakness along the periphery of the serpentine dykes.

The serpentine composing the dykes is largely altered and decomposed especially adjoining the contact rocks where it usually appears in the form of a yellow-brown clay.

ECONOMIC GEOLOGY: (1) General:

The iron deposits consist principally of magnetite with minor amounts of haematite and limonite. They occur as irregaulrly shaped and discontinous lenses almost wholly contained in serpentine dykes and the associated lime silicate hornstone etc. It is probable that at least one of the lenses occurs in slates and quartzites, but this was not definitely proved.

At surface, the iron is very pure, being only slightly hydrated in some localities, and generally free from gangue minerals. It occurs as massive crustifications of magnetite and there is little doubt that it represents a secondary enrichment and concentration. At shallow depths the character of the deposits alters and the magnetite is present in intimate association with altered and decomposed serpentine and tremolite etc. in the form of clay and with lime silicate hornstone in places. Away from the influences of weathering the iron bodies are massive to a large extent, except for the inclusion of clay particles. Nearer the surface the magnetite is generally loosely compact and occurs as fine grains in the clay. In some instances the iron and clay appear as loose running masses, causing underground workings to cave and fill.

In general the massive parts of the iron lenses are non-crystalline but cavities are occasionally present in which well-formed rombic dodecahedra have crystallised out in clusters; suggesting pseudomorphis after garnet.

A little pyrite is directly associated with the magnetite below water level in some of the minor lenses, but generally the iron is free from sulphides. Small veins of pyrite occur rarely along the walls and in the vicinity of the iron bodies.

The origin of the magnetite deposits appears to be related to contact metamorphic effects of the granite intrusion. The iron lenses are, in no instance, far distant from the granite, and other lenses in adjacent areas occur almost at the contact. Elsewhere in the Heemskirk district similar magnetite deposits, occurring about the granite margin, are not confined to the basic rocks and are, therefore, not connected with anything in the nature of magmatic segregations. It is considered that the magnetite was deposited from solutions emanating from the acedic magma prior to consolidation of the granite massif. This took place at the same period, or immediately following the alteration of outer edges of serpentine dykes to lime silicate hornstone etc.

(2) History:

The Comstock iron deposits have been known to exist since about 1885. The first prospecting was undertaken by the Tenth Legion Company many years ago when exploring for silver-lead deposits. An adit was commenced from

south bank of Pine Creek and passed through several lenses of magnetite.

The area was aquired by numerous interests at various periods from 1887 to 1920. In the latter year, when the lease holder was G. & C. Hoskins Company Limited, a vigorous campaign was instituted to test the iron deposits of the district. In the following 16 years, 17 adits were driven with the object of proving the continuity of the iron below surface in the various o occurrences. During this period the leases were transferred to Hoskins Iron and Steel Company Ltd. and later to Australian Iron and Steel Ltd. The area covered by the deposits is at present leased in the name of G. Howard.

No other mining development has been undertaken and, with the exception of small samples for assay and experimental purposes, no ore has been removed from the property.

The area described below includes an east-west belt containing the Tenth Legion zones Nos. 1 and 2 and a north-south belt, commencing 20 chains south of the former and consisting of zones No. 3 to 11.

(3) <u>The Deposits</u>:

(a) Sections 60M/38 - 29 acres (Tenth Legion Mine) and 59M/38 - 10 acres - G. Howard, Lessee.

The Tenth Legion, or No. 1 zone, outcrops strongly along the top of a well defined ridge extending 12° north of west through the greater portion of the mineral lease, and rising to a maximum height of 170 feet above Pine Creek. The eastern end of the outcrop extends for a short distance into Kynance Prospecting Syndicate lease, No. 5142/93M. At surface the deposit consists of dense magnetite along a length of 1700 feet, which is exposed here and there over an average width of 240 feet. In places where outcrops are well defined belts of clay are exposed between magnetite lenses, while in other localities iron boulders obscure the underlying features.

Underground workings consist of adit cross-cuts numbered 1 to 4 and spaced at regular intervals along the northern fall of ridge above Pine Creek. The most eastern adit (No. 4) did not reach the objective but the remainder penetrated a zone of parallel composite lenses, dipping north at high angles. The lenses of iron ore are not well defined underground but have been divided for convenience of description into A, B, and C in that order from north to south.

As illustrated in Plan No. 2 the whole of principal series was passed through in No. 1 adit, B and C, together with several insignificant occurrences in No. 2 adit and C lense only in No. 3 adit. Each lense, with the possible exception of No. 1, is divided within itself into several sub-lenses by the inclusion of irregular bands of decomposed serpentine and lime silicate hornstone etc. which contains only a little magnetite of no consequence.

During the survey No. 2 adit only was open for inspection and sampling but information obtainable from various sources with regard to Nos. 1, 2 and 3 has been plotted in correct relation and shown on plan No. 2. The latter indicates "C" lense as being the most important, having an average width, excluding bands, of 49 feet. As this almost certainly corresponds with the strong outcrop along 1700 feet of the ridge top, the lense is the longest of the series. "B" lense was not cut in No. 3 Adit so that the length is limited westerly to a point between Nos. 2 and 3 adits. East of No. 1 Adit this lense probably extends to the termination of the outcrop, since the general width in that direction is sufficient to include both "C" and "B" lenses. The length of "B" lense has been taken as 1400 feet and the average width, excluding bands, as 28 feet.

The backs obtainable in the lowest adit (No. 1) for "C", "B" and "A" lenses are 100, 90, and 70 feet respectively.

(b) Section 59M/38 - 10 acres. G. Howard, Lessee

No. 2 Zone is situated on west side of Pine Creek, seven chains north-west of Tenth Legion Zone. Magnetite outcrops solidly along the upper part of a small ridge on a bearing of 292°. from eastern boundary of the section, for a distance of 350 feet. The outcrop then turns north and eventually curves to the north-east, making a total length of 530 feet with an average width of 35 feet.

No. 12 Adit (Plan No. 3) was driven as a crosscut south-westerly from a small branch of Pine Creek, 80 feet below the ridge top. Dense magnetite encountered at 120 feet was driven into for four feet before work was discontinued.

One iron lense only is present from surface indications but this was not proved owing to incomplete underground development.

(c) Section 61M/38 - 25 acres. G. Howard, Lessee

No. 3 Zone occurs about ¼ mile south of Tenth Legion Zone and extends west-north-westerly from eastern boundary of the enclosing mineral section over a maximum length of 600 feet. The greatest width of iron exposed at surface is 250 feet, about centre of outcrop, but is much less at either end. Solid magnetite is not prominent at surface.

No. 10 Adit (Plan No. 4) driven 303 feet north-easterly from south-west side of outcrop, passed through three magnetite lenses, separated by bands of decomposed rock. No. 1 lense commences 20 feet from portal and extends over a width of 31 feet. No. 2 lense was encountered at 94 feet and proved to be 63 feet wide. No. 3 lense was cut at 169 feet and continued to 272 feet.

The approximate amount of backs obtainable in adit on No. 1, 2 and 3 lenses are 15 feet, 25 feet, and 40 feet respectively.

Large quantities of magnetite coated with limonite are stacked at approach to adit.

(d) Section 62M/38 - 40 acres. G. Howard, Lessee

This area includes Zones No. 4 to 10. No. 4, 6 and 7 Zone, crossing northern boundary of the section, are present at

surface in the form of magnetite and limonite boulders and gravel with minor outcrops in some localities. No underground development has been attempted.

No. 5 Zone is exposed in north-east quarter of the section in the form of massive magnetite on a prominent hill-top, which rises 140 feet above Kynance Creek plains, to the west. The zone can be traced at surface for 460 feet along a north-west trending belt, with an average width of 73 feet.

Underground developments (Plan No. 5) consist of an adit and tunnel (Nos. 3 and 5) both of which were open for inspection. The adit is the lower opening, being 53 feet below tunnel, and was driven on a bearing of 303° for a distance of 245 feet from creek level on south-east side of hill. At 22 feet from portal, six feet of magnetite with some included clay crosses the adit. A little magnetite occurs in clay up to 106 feet. From that point a lense of danse magnetite extends for 50 feet. This was sampled throughout. Near centre of lense a small seam of pyrite traverses a clay band. On west side of the magnetite body the adit is caved and the remainder could not be examined, but it is reported that a mixture of magnetite and decomposed serpentine continues for approximately 30 feet farther. At 77 feet in adit, crosscuts open to the north-east and south west for 103 feet and 146 feet respectively. In north-east cross-cut no defined body of iron is visible although bunches of magnetite occur in serpentine clay along the lower part of the first 20 feet. Between 20 feet and 60 feet from adit veins and bunches of pyrite occur frequently. In the first few feet of south-west crosscut a little pyrite is visible in clay. At nine feet from adit the iron lense was cut and continued over a width of 84 feet.

No. 5 Tunnel commences on south-west side of hill at 42 feet below the crest. It was driven on a bearing of 71° and the level penetrated to surface on east side of hill in a distance of 237 feet. A body of fine granular magetite and clay, dipping at a low angle to the east, was cut at 87 feet from mouth and extended over a width of 138 feet. A cross-cut to the north-west, at 106 feet in tunnel, reveals similar material for 42 feet, also dipping easterly.

No. 8 Zone is situated in west-centre of the section on east side of Kynance Creek. Loose gravel and boulders of magetite and limonite cover the surface in a meridional direction along a length of 330 feet. Towards the north end 50 feet of solid iron is disclosed in an east-west trench. Two hundred feet further south loose hydrated boulders of iron are exposed in a shaft and trench. No.0 Adit (Plan No. 4) was driven northerly from the fall to Kynance Creek, on what appears to be a south-easterly extension of the zone. For the first 100 feet in the adit small amounts of magnetite were encountered, in the form of bunches and minor bands, scattered through serpentine clay. From the evidence obtained No. 8 zone is apparently of little importance.

No. 9 Zone trends north-westerly across a small branch of Kynance Creek in southern part of the mineral section. The strike is north-westerly along a length of approximately 240 feet and average width 60 feet. It is generally parallel to Zones 5, 6, and 7 and, like the former, the iron dips to the north-east. Dense magnetite outcrops on the hillslope 30 feet above No. 2 Adit.

Underground workings consist of No. 2 Adit (Plan No. 6) driven 142 feet north-easterly from a point on eastside of, and 40 feet above, Kynance Creek. At 62 feet from mouth pyrite occurs ober a width of two feet in serpentine clay. Solid magnetite of good quality commenced at 68 feet and continued for 63 feet, including a one foot band of decomposed serpentine at 119 feet from portal. A cross-cut to the east at 90 feet in adit exposed magetite along the first 37 feet. This included a narrow band of serpentine at 30 feet, corresponding with that encountered at 119 feet in adit.

No. 10 Zone strikes in a south-westerly direction along ridge from west side of Kynance Creek, across south boundary of the section and extends to the middle of abandoned lease 8431/M. The total length approximates 680 feet and average width 40 feet. Outcrops of magnetite occur in few localities but the surface is strewn with quantities of iron boulders. Two adits (Plan No. 6) were driven north-westerly from the fall to Kynance Creek with the object of cross-cutting the iron body. No. 1 Adit is located in the leased section at 60 feet below the highest adjacent outcrop on the ridge above. It commences on a bearing of 294° and at 27 feet branches deviate 69 feet north-west and 74 feet to the south-west. In the latter a lense of magnetite with clay inclusions extends across 42 feet and dips at 80° to the south-east. Magnetite is exposed for at least 55 feet in north-west branch and probably continues to the face, but the adit is caved and is now inaccessible for the last 14 feet approximately. No. 4 Adit is situated 4½ chains to the south and 27 feet lower than No. 1 adit. It was directed north-westerly for 260 feet towards a narrow outcrop of iron on the ridge above, but only penetrated three minor bands containing magnetite between 160 and 198 feet from portal.

(e) Section 65M/38 - 5 acres - G. Howard, Lessee

No. 11 Zone courses diagonally from north-east to south west through this section over a length of 590 feet. Solid magnetite outcrops strongly along the greater portion of this length, along the top of a prominent spur. Underground workings consist of an adit crosscut started near northern boundary of lease at 40 feet below outcrop. This was driven south-easterly and cut the iron lense at 146 feet from the mouth.

The latter proved to be 88 feet in width and consists principally of fine magnetite aggregates with interstitial clay and weathered serpentine. Occasional boudler-like masses of solid magnetite also occur. (See No. 11 adit on Plan 4).

4. Quality of the Iron Ore

In all 42 samples were taken as a series of sections across the lenses in the accessible adits developed on Zones No. 1, 5, 10 and 11.

The assays invlowed were carried out in the Mines Department Laboratory, Launceston.

From the assays of the sampled sections the following tables have been compiled.

ASSAYS OF SAMPLES FROM THE VARIOUS SECTIONS ACROSS IRON LENSES

Adit No.	Iron	Acid Insol.	Silica	Manganese	Phosphoric Acid	Titanic Oxide	Alumina	Lime	Magnesium Oxide	Sulpur	Sample No.	Width of sample Ft.	Width of sample in.
3	60.6	7.28	7.08	0.49	0.05	0.07	1.48	Tr.	0.62	0.07	1	6	2
"	61.5	0.96	0.92	0.15	0.07	0.04	0.87	Tr.	0.36	0.14	2	10	
"	59.5	1.20	1.08	0.04	0.14	0.04	0.57	0.06	0.13	0.16	3	10	
"	62.9	1.64	1.48	0.27	0.08	0.02	0.96	Tr.	0.72	0.13	4	10	
"	63.9	0.88	0.76	0.23	0.02	Tr.	0.54	0.06	0.62	0.07	5	10	
"	63.5	1.16	0.96	0.33	0.03	Tr.	1.32	Tr.	0.68	0.04	6	9	6
"	51.9	15.24	14.88	0119	0.09	0.17	2.27	Tr.	0.26	0.10	7	20	
"	58.1	7.20	7.04	0.23	0.09	0.11	1.86	Tr.	0.46	0.10	8	20	
"	56.4	9.20	9.00	0.25	0.10	0.16	2.03	Tr.	0.34	0.09	9	20	
"	52.6	13.40	12.96	0.27	0.08	0.17	2.17	0.06	0.36	0.14	10	12	
"	48.9	15.36	15.04	0.80	0.09	0.15	3.97	Tr.	0.32	0.15	11	12	
10th Legion)	65.8	0.92	-	0.80	0.08	0.02	1.67	Tr.	2.24	0.01	12	9	
"	67.0	0.88	-	0.80	0.03	0.07	2.20	Tr.	1.70	0.03	13	8	9
"	66.5	1.56	1.36	0.93	0.03	0.07	1.57	0.06	1.72	0.02	14	8	
"	67.3	1.08	-	1.12	0.08	0.03	0.90	Tr.	1.56	0.02	15	3	8
"	65.7	1.84	1.72	0.80	0.03	0.08	2.84	Tr.	1.62	0.02	16	6	6
"	68.2	0.76	-	0.53	0.02	0.04	1.21	Tr.	1.98	0.02	17	9	
"	69.1	0.48	-	0.71	0.02	0.03	0.48	Tr.	1.96	0.02	18	13	6

TABLE 1 (cont.)

Acid No.	Iron	Acid Insol.	Silica	Manganese	Phosphoric Acid	Titanic Oxide	Alumina	Lime	Magnesium Oxide	Sulphur	Sample No.	Width of Sample ft.	in.
2 (10 Legion)	67.4	3.32	2.08	0.28	0.02	Tr.	0.98	0.06	1.50	0.01	19	10	
"	65.0	5.80	3.12	0.31	0.02	Nil	0.41	0.06	2.30	0.12	20	10	
"	61.9	4.63	4.50	0.58	0.08	0.08	0.61	0.06	3.68	1.43	21	11	
"	67.9	0.68	-	0.90	Tr.	0.03	1.72	0.26	1.30	0.05	22	11	
"	68.0	0.40	-	1.02	0.02	Tr.	1.41	0.34	1.38	0.03	23	12	
"	67.2	0.52	-	0.76	0.03	0.02	1.05	0.22	1.36	0.05	24	10	
"	60.2	5.24	5.14	0.76	0.06	0.05	0.92	Tr.	0.74	0.10	25	10	
"	56.6	4.80	4.68	0.44	0.09	0.08	1.08	Tr.	0.10	0.18	26	10	
"	62.1	2.00	1.88	0.48	0.05	0.04	1.17	Tr.	0.74	0.10	27	10	
"	65.4	2.12	1.96	0.98	0.04	0.04	1.45	Nil.	1.22	0.06	28	10	
"	66.5	1.70	1.50	0.80	0.03	0.04	1.38	Nil.	1.20	0.04	29	10	
"	67.1	0.60	-	1.59	0.03	0.03	0.51	Nil.	1.36	0.04	30	10	
"	67.6	0.48	-	0.99	0.02	0.03	1.52	Tr.	1.30	0.04	31	10	
"	67.4	0.68	0.24	1.09	0.02	0.03	1.03	Tr.	1.42	0.03	32	10	
"	66.4	0.88	-	1.35	0.02	0.04	0.81	Tr.	1.30	0.07	33	10	
"	62.3	1.06	0.98	1.90	0.02	0.04	3.70	Tr.	1.42	0.05	34	15	
11	66.4	1.00	-	1.78	0.01	0.05	0.73	Nil.	1.52	0.02	35	20	
"	64.9	2.52	2.44	0.98	0.03	0.06	1.20	Tr.	2.88	0.08	36	20	
"	67.0	0.24	-	1.31	0.04	0.07	1.31	Tr.	1.54	0.06	37	20	

T A B L E I. (Cont.)

Adit No.	Iron	Acid Insol.	Silica	Manganese	Phosphoric Acid	Titanic Oxide	Alumina	Lime	Magnesium Oxide	Sulphur	Sample No.	Width of Sample ft.	in.
11	65.3	0.32	0.20	1.18	0.03	0.08	3.57	0.06	1.30	0.05	38	14	
"	64.7	0.70	0.66	1.02	0.06	0.04	3.01	0.06	1.40	0.07	39	14	
1	66.1	0.48	-	1.02	0.06	0.08	0.77	0.06	1.00	0.04	40	14	
"	66.6	0.44	-	1.43	0.04	0.05	0.98	0.06	1.06	0.05	41	14	
"	66.1	0.68	0.48	2.84	0.03	0.05	1.31	0.10	1.22	0.02	42	14	

T A B L E II

QUALITATIVE RESULTS OF FURTHER TREATMENT OF VARIOUS SAMPLES.

Gold	Silver	Nickel	Cobalt	Chromium	Sample No.
-	-	Nil	Tr.	Nil	1
Nil	Nil	-	-	-	8
-	-	Nil	Tr.	Nil	9
Nil	Nil	-	-	-	15
-	-	Nil	Tr.	Nil	18
Nil	Nil	-	-	-	24
-	-	Nil	Tr	Nil	27
Nil	Nil	-	-	-	30
Nil	Nil	Nil	Tr.	Nil	36
-	-	Nil	0.04%	Nil	42

TABLE 111

WEIGTHED AVERAGE ASSAYS OF CONSTITUENTS IN LENSES SAMPLED

	Iron	Acid Insol.	Silica	Manganese	Phosphoric Acid	Titanic Acid	Alumina	Lime	Magnesium Oxide	Sulphur
No. 1 ZONE ("B" Lense	66.5	1.23	1.20	.87	.05	.055	1.91	Tr.	1.81	.02
("C" Lense	66.4	2.90	2.14	.50	.03	.03	.71	.03	2.30	.32
No. 5 ZONE	61.4	4.35	4.20	.61	.05	.06	1.60	.04	.73	.13
No.11 ZONE	65.76	1.02	0.98	1.28	.03	.06	1.78	Tr.	1.78	.05
No.10 ZONE	66.27	.53	.46	1.76	.04	.06	1.02	.07	1.09	.04

It will be seen from the assays in Table 111 that the ore is generally of high quality and consists essentially of iron (61.4 - 66.5%), with inconsiderable amounts of impurities in the form of silica (0.46 - 4.2%, managanese (0.5 - 1.76%), phosphoric acid (0.03 - 0.05%), Titanic Oxide (0.03 - 0.06%), alumina (0.71 - 1.91%), lime (trace - 0.07%), magnesium oxide (0.73 - 2.3%) and sulphur (0.02 - 0.32%).

(5) QUANTITY OF ORE AVAILABLE

In estimating quantities of ore only those zones are included in which the iron lenses have been proved by underground workings to extend below surface at contact with the country rocks.

The tonnages given below are calculated according to the average percentage of magnetite as indicated by sampling the average lengths and widths as shown by surface and underground measurement, and the depths to lowest adit in each zone which the iron was proved to extend.

The following figures represent quantities of ore available for mining by open-cut methods:-

		Long tons.
No. 1 Zone	("A" Lense	60,540
	("B" Lense	443,710
	("C" Lense	986,300
No. 2 Zone		192,700
No. 3 Zone		269,200
No. 5 Zone		291,000
No. 9 Zone		58,280
No. 10Zone		144,500
No. 11Zone		273.500
		2,719,730

In addition moderate quantities of probable ore exist both in the developed lenses below the proved depths, and in the several small undeveloped bodies in this and adjacent area to the west.

The above estimates show that the quantities of ore obtainable at Comstock must be considered as small under present economic conditions. The deposits are of inadequate size to render uninterrupted supplies for a sufficient term to allow for amortization of plant and capital, in the consideration of large scale blast furnace smelting operations. It is in the development of small electric smelting units that the Comstock magnetites have potential possibilities in the future.

(6) MINING AND TRANSPORT:

The Comstock iron deposits are so situated, on hills and ridges rising above the general level of adjacent low-lying tracts that the ore could be extracted by open-cut methods of mining

However, since the ore bodies are comparatively small, and scattered over a wide area, mining costs would inevitably be high.

Transport to the sea-board at the port of Strahan could readily be made available by an extension of the railway line, of approximately six miles, from Zeehan to the deposits, making a total distance of 35 miles.

(7) CONCLUSIONS:

The survey of Comstock magnetite deposits has revealed that numerous short and narrow lenses occur in a sporadic manner in the locality. Several of the bodies have been proved by underground workings to extend to moderate depths below surface. The quantities of ore available are relatively small and, although open-cut methods are fesaible, mining costs would probably be high.

Rail transport to a shipping port, 30 miles in length, is available and an extension of the line for six miles from present rail-head to the deposits presents no difficulties.

F. BLAKE
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