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REPORT ON THE SCAMANDER MINING DISTRICT IN APRIL, 1897.

Mines Office, Launceston, 15th May, 1897.

SIR,

I HAVE the honor to submit the following Report of an examination made of the Mining Field in the vicinity of the Scamander River, in pursuance of your instructions.

The principal rocks of the district consist of slates and sandstones, frequently a good deal metamorphosed. No fossil evidence has, so far as I am aware, been found to prove their age, but they probably belong to the Lower Silurian series. Their general strike is approximately parallel to the Scamander Range, *i.e.* N. and S., and they dip at high angles to the west. Close to the Scamander Bridge they are penetrated by a belt of granite, which forms an anticlinal ridge, the sedimentary rocks dipping in opposite directions on either side. For some miles north and south along the coast they are overlain by Marine Tertiaries, which are also seen in isolated patches in other parts.

The mines may be roughly divided into two groups, viz., those in the igneous rocks, as the old Scamander and Beulah Mines, and those in the sedimentary rocks, including the Eastern Proprietary and Yarmouth Mines; but it is noticeable that whereas the lodes in the Eastern Proprietary and adjacent properties have a general strike of north west and dip to the south west, the Yarmouth lodes strike about north east and dip slightly to the south east.

The only properties on which any work was being done at the time of my visit were those of the Eastern Proprietary Copper and Silver Mining Company and the Beulah Silver Mining Company, and at the latter only by tributors.

The former company holds an extensive property consisting of ten sections, 233-93M, 232-93M, 57-93M, 56-93M, 370-93M, 228-93M, 229-93M, 230-93M, and 564-93M, which extend in a north-westerly direction from a point near the head of the right or East Arm of the Scamander River, distant by the river about five miles from the bridge. The total area is 474 acres, 160 acres of which, contained in Sections 56-93M and 57-93M, are held as reward claims for copper. The outcrop of the main lode can be traced with few breaks for over two miles in a north-westerly direction from the most southerly block, and consists chiefly of siliceous ferruginous matter showing no copper-bearing minerals to the naked eye, though I believe traces of copper can generally be obtained by analysis. In Section 57-93M a tunnel was driven 43 feet in a south-easterly direction in gossan assaying fairly well for silver, but with little or no copper, but, copper and iron pyrites and blende were obtained from a small prospecting shaft 15 feet deep sunk a little below the tunnel; this shaft is now full of water.

The main workings are on Section 56-93M, where a long tunnel has been driven along the lode, starting on the north side of a large creek running through the section in a north-easterly direction.

The outcrop forms the crest of a ridge which rises some 600 feet above the level of the tunnel; and at a point in Section 229-93M about 500 feet above the mouth of the tunnel there is a strong outcrop cutting the main lode at an angle of about 45 degrees, but apparently without faulting it.

The point of intersection of the two lodes is, approximately, 40 chains horizontally from the mouth of the tunnel. The tunnel, starting at a point about 130 feet above sea level, has been driven a distance of 870 feet in a general north-westerly direction, and several good shoots of ore, apparently dipping south, have been passed through. In the back of the tunnel the ores are mostly oxidised, consisting of earthy black and red oxides and blue and green carbonates of copper, but underfoot copper glance predominates, and this with copper pyrites will probably be the principal ore below the water level. Copper glance or chalcocite when pure consists of 79·8 per cent. copper and 20·2 per cent. sulphur, but usually contains one or two per cent. of iron. The lode is a very wide one, and the necessary precaution has been taken of driving cross-cuts at intervals of 50 to 100 feet, which prove the lode formation to be from 20 to 40 feet wide, and some promising veins have been cut carrying carbonates, oxides, and sulphides of copper. The bulk of the formation consists of slaty lode-matter much kaolinised, yielding a small per-centage of copper, but, from the nature of the ores at this level, it does not admit of concentration.

At 440 feet from the entrance a strong body of ore was cut about 8 feet wide carrying copper-glance and tile ore (mixed oxides of copper and iron), and a winze was sunk to a depth of 85 feet, which at the time of my visit was full of water to within about 12 feet of the tunnel

level. Mr. Cameron, the mine manager, informed me that cross-cuts had been driven at 80 feet, 15 feet W., and 19 feet E. in lode-matter all the way, but as the water became too heavy for baling an opening was made at 47 feet and cross-cuts at this depth showed the lode to be 39 feet wide. A drive was also put in south along the lode, and the ore stoped out to within a few feet of the tunnel.

From this stope and from the ore obtained in driving the tunnel, about 120 tons of hand-picked ore were sent away, returning an average of 28 per cent. copper and 17 ozs. silver per ton. There are also about 300 tons of second-class ore at grass, which appear to have been very carefully sampled, and assayed from 10 to 15 per cent. copper and 10 ozs. silver per ton.

A few feet beyond the winze a rise was started to connect with the surface in about 200 feet for air. This was put up 136 feet. For the last 80 feet it carried little or no copper, and, as the air in the end remains good, it has been discontinued for the present.

The last cross-cuts were at 832 feet from the entrance, 24 feet east and 10 feet west, through slaty lode-matter impregnated with iron pyrites. The face at present shows similar material, with a good deal of kaolin, and on the hanging-wall is a thin vein carrying black oxide of copper. Some 45 feet ahead of the present face, crystals of chloro-bromide of silver (embolite) are said to have been found in a trench on the surface, and the intention is to extend the tunnel under this point in the hopes of meeting a rich shoot of ore.

On the whole the prospects disclosed by the tunnel working are decidedly encouraging, but it is certain that before the mine can hope to produce regular supplies of ore, a main shaft will have to be sunk and equipped with machinery. A rough cart-road has been made from the tunnel to the landing at the head of the East Arm of the Scamander, and from here the ore hitherto sent away has been taken down to the bridge in boats: this necessitates a lot of re-handling, and eventually a good cart-road or tramway will have to be made to connect with the main road.

The other work done on this property consists in a few trenches across the outcrops of two parallel lodes in Section 370-93M, exposing some very promising looking gossan. One of these outcrops can be traced on to the adjoining Section 341-93M, locally known as Loane's Section, where a tunnel has been driven on the lode for about 100 feet in a north-westerly direction through alternate bands of slate and sandstone striking north and south. In the face of the tunnel there is a foot of good-looking gossan, with a bunch of ore consisting principally of arsenate of iron with a little copper pyrites. At the entrance to the tunnel a shaft was sunk about 25 feet, but it was full of water, and I could not learn what the lode was like in the bottom. The lode has been cut again in several trenches higher up the hill, and in one of these, about 80 feet above the tunnel level, shows about one foot wide with well defined walls standing almost vertical and striking north-west. A sample from here assayed by Mr. Ward, Government Analyst, yielded 2·2 per cent. copper, 1 dwt. 15 grs. gold, and 8 ozs. 9 dwts. 20 grs. silver per ton.

Another strong gossany outcrop was seen on this Section, but no work has been done on it.

Further north, on what is known as Cramp's Section, a shaft has been sunk 100 feet, but it was inaccessible owing to water and bad air. So far as I could learn, no driving has been done from the bottom, but the ore on the top shows copper and iron pyrites, with stains of blue and green carbonates of copper.

North Scamander.—This Company holds Sections 718-93M and 719-93M, situated to the south of the Eastern Proprietary tunnel. The only lode on which any work has been done, so far as I saw, was one exposed in the bed of a creek running in a deep rugged gully through Section 719-93M. A shaft, which I was informed was 25 feet deep, was full of water at the time of my visit, as were also one or two trenches, and it was impossible to tell accurately the strike or width of the lode, which is evidently a very strong one. The ore at surface shows a dense mixture of blende, pyrites, and galena, with bunches of fairly pure copper pyrites and strings of clean galena. In places there is a good deal of pyrrholite or magnetic pyrites, which had a sensible influence on the needle. The gangue is very hard and siliceous, and the lode-filling does not seem to be much oxidised or leached. A sample which I took of some of the blende and pyrites returned 6 per cent. of copper, 1dwt. 15grs. of gold, and 5ozs. 15dwts. 12grs. silver per ton. This lode seems well worth further prospecting, but water is likely to prove troublesome. As, however, the ore is so little oxidised, a tunnel might be driven with advantage.

On Section 353-93M a very strong outcrop is seen, and several trenches have been cut across it, in one of which I noticed a siliceous gossan formation about 6 feet wide. The outcrop can be traced to the top of the ridge about 530 feet above sea level. This hill offers very good facilities for tunnelling along the lode, though it is probable that here, as in the Eastern Proprietary, the oxidised zone will extend to a considerable depth.

Several other similar outcrops were seen on the adjacent sections, and there is evidently a wide belt of country traversed by a series of parallel lodes which, from the results obtained in the Eastern

Proprietary Mine, seem worth further prospecting. It is all open country, easily accessible, with an abundant supply of good timber.

The old Scamander Mine is situated on private property, about a quarter of a mile above the Scamander Bridge on the south side of the river. It was started more than 11 years, and some high grade ore was obtained assaying up to nearly 200 ozs. silver and 9 dwts. of gold per ton, but it proved very refractory, and the mine being situated so close to the river, the water was heavy. A tunnel was driven about 200 feet to the contact of the igneous and sedimentary rocks, and several veins of quartz were cut which are said to have yielded rich silver ores.

An underlay shaft was sunk near the entrance of the tunnel, and higher up the hill a main engine shaft was sunk 130 feet deep, but these were both inacessible owing to water. The ore at grass shows principally crystalline arsenical and iron pyrites, zinc blende with a little galena and copper pyrites in a quartzose matrix.

On the north side of the river, about three-quarters of a mile from the bridge, are situated the Beulah, South Beulah, and Scamander Bell mines. The granite has here weathered *in situ* to a very considerable depth, but in places large kernels of undecomposed granite are met with, surrounded by decayed rock.

On the Beulah (Section 371–93M, 80 acres), two lodes have been worked from a series of shallow shafts and trenches, and in one place on the No. 2 or east lode a length of about two chains was stoped to the surface from a depth of about 40 ft. The lodes consist of iron-stained quartz, the silver being chiefly in the form of chloride in cavities in the quartz. Where the quartz is more solid a good deal of pyrites occurs which is also said to assay well for silver and gold. The lodes vary in thickness from a few inches up to a foot, and as exposed in the upper workings seem to be striking a little east of north, and dip at angles of about 45° to the east, but they are somewhat erratic. No. 2 lode is about 200 ft. east of No. 1, and about 200 ft. east of No. 2 a main shaft was sunk to a depth of 110 ft. At this depth water was struck, but only rose a few feet, and at 100 ft. a cross-cut was started and driven 134 ft. west, but was discontinued after meeting some hard granite "boulders" without cutting the lode. Except where these solid kernels occur, the ground is very soft, as may be judged from the fact that the main shaft, which is 9 ft. by 3 ft. 3 in. in the clear, was sunk for 14*s.* 6*d.* per ft., and the cross-cut driven for 7*s.* 6*d.* per ft., and it is a pity that this cross-cut was not continued. At present the mine is in the hands of tributors, who are burrowing out the more easily accessible parts up to about 40 ft. in depth. Since the beginning of 1896 about 51 tons of ore have been sent away, the average assays from which were 92½ ozs. silver per ton, one lot of 6 cwt. going as high as 241 ozs. For these figures I am indebted to Mr. Gaunt, the Legal Manager of the Company.

On the South Beulah (Section 648-93M, 40 acres) several shafts were sunk some years ago, but very little driving was done. To the east of the Beulah are two Sections, 933-93M and 934-93M, belonging to the Scamander Bell Company. A small vein of quartz and gossan is exposed in a trench, from which I broke specimens showing chloride of silver. A shaft was sunk 60 feet last year and a cross-cut driven 20 feet west, but not far enough to cut the lode. Large "boulders" of undecomposed granite were encountered in sinking this shaft, considerably increasing the cost. The ore bodies at present exposed in these mines are small and patchy, and unless larger lodes are discovered by cross-cutting they will not pay to work when the solid granite is reached.

Some three miles to the north of the Beulah is the property of the Yarmouth Proprietary Company, which holds Sections 743-93M and 744-93M of 40 acres. A creek runs through the centre of the sections from west to east, in the bed of which three lodes have been cut running about north east. On what is known as No. 1 lode (the centre one of the three) a shaft was sunk close to the creek (which has been here diverted for some chains in length). This shaft is 37 feet deep, and an opening was made at 32 feet and a drive put in north east about 20 feet, the lode in the end being full width of the drive, but the water was too strong to cope with the windlass, and driving was discontinued. These particulars I obtained from Mr. Brooks, the late mining manager, as the shaft was full of water at the time of my visit. The stone at grass shows a highly siliceous matrix, carrying a large proportion of crystalline arsenical pyrites with strings and splashes of galena and copper pyrites, picked samples from which have assayed up to 14 dwts. gold and 40 ozs. silver per ton.

This lode has also been cut in a trench on the north side of the creek, and shows about six inches of gossan, samples from which, Mr. Brooks informs me, had assayed 3 dwts. gold and 9 ozs. silver per ton.

About two chains higher up the creek No. 2 lode has been cut in several trenches, and, as far as could be seen, is about two feet wide, carrying arsenical pyrites and a little copper pyrites with stains of malachite. A sample which I took from here yielded 1 dwt. 15 grs. gold, 2 ozs. 15 dwts. 12 grs. silver per ton, and 3·5 per cent. copper.

What is known as No. 3 lode is east of No. 2, but sufficient work has not been done to determine its strike or dip. A few pieces shot from the capping show an intensely siliceous matrix, in which I noticed a little pyrites and blende. The country rock consists of slates and sandstones, in some places much indurated and altered to quartzite.

On this and the adjoining sections several other outcrops were seen similar to those near the Eastern Proprietary, but no work worth mentioning has been done on them. These properties are very easily accessible, the Yarmouth Mine being only about half a mile from the main road, about 8 miles from St. Helen's.

I also paid a hurried visit to the Silver Echo Mine, which, though not exactly in the Scamander District, is apparently on the same belt of country as the Eastern Proprietary Mine. It is situated to the north of Constable's Creek, about five miles from the town of St. Helen's. This property has been taken up at different times for tin, gold, and silver, but very little work was done until it came into the hands of the present holders, Messrs. H. Grant and party, of St. Helen's, who have shown their faith in it by the work they have done.

The workings are situated on Section 330-93M, at about 350 feet above sea-level. A creek with steep hills on either side runs through the section from south to north, and along the bed of this a trench about six feet wide and four feet deep has been cut in a southerly direction for forty feet through a big quartz outcrop, which I judged to be about thirty feet thick. The quartz again outcrops some distance up the hill on the west of the creek, and its strike is apparently about thirty degrees east of north. At a height of 750 feet above sea-level, or 400 feet above lode in the creek, on the eastern spur another outcrop of a gossany character is seen striking north west towards the present workings, and, Mr. Grant informed me, could be traced south east as far as Constable's Creek—about a mile and a half away. In the hope of cutting this lode a tunnel was started from the end of the trench and driven a total distance of 161 feet. In places the cleavages and joints in the schists show scales of native copper, but the lode was not cut, and it is probable that the junction is further north. Close to the mouth of the tunnel a shaft was sunk about fifteen feet on a large body of pyrrholite, which Mr. Grant informed me was giving way to cupriferous iron pyrites in the bottom. A sample I took of the pyrrholite gave traces of gold and silver and 0·1 per cent. copper. The main mass of this magnetic pyrites, though attractable by the magnet when powdered, does not affect the compass needle, but at one place there is a very decided deflection, the needle pointing due south. In the quartz are several small veins carrying black and red oxides of copper, and there is one vein about a foot wide of iron pyrites containing a little copper, a sample from which gave traces of gold and silver and 0·3 per cent. copper.

The ore as at present exposed is mostly of low grade, but, with such a big formation, there is much encouragement for further prospecting by driving along and cross-cutting the lode in the hope of meeting richer veins and shoots of ore. The country rocks are similar to those in the neighbourhood of the Eastern Proprietary Mine, and I noticed several indications of gossan outcrops.

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J. HARCOURT SMITH, *B.A.*,
Geological Surveyor.

The Secretary for Mines, Hobart.