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PENGUIN SILVER – COPPER CLAIM

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Report by Experts concerning the Penguin Silver and Copper Claim
on the North Coast of Tasmania, with a few notes by Gilbert Elliot.

Melbourne, January 2nd, 1882.

Gilbert Elliot Esqre,
South Road, Brighton.

Dear Sir,

MICROFILMED

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In accordance with your request I inspected your silver mine and other mining prospects at the Penguin, principally under the guidance of Mr. Sullock; having arranged my journey to Mt. Bischoff so as to be able to devote a full day to the inspection and to examine the prospects along the beach at low tide. In the following I now beg to give you a report of this inspection

The Silver Mine - I inspected this mine about eight years ago, shortly before it was given up, and from observations I then made, assisted by plans of the workings shown me by the manager, I came to the conclusion that there existed no real well defined lode on the ground. The country rock - which consists, to all appearances, of an intrusive feldstone all along the beach to even beyond the site of the pyrites outcrop to be noticed further on - seemed to be traversed in all directions by veins of such ores as iron pyrites, associated with copper pyrites, galenite with zinc blende and tetrahedite (?) which latter gave by assay a high percentage of nickel and copper, and several hundred ounces of silver per ton. I place the query sign behind the name intentionally, because the mineral was never properly analysed and found in crystals to identify it as tetrahedite. The veins sunk and opened out upon were those in which this valuable ore was first discovered at the surface, but they proved very irregular in dip, strike, and thickness, and the tetrahedite next to disappeared in them. Other veins containing only iron pyrites and zincblende that did not extend to the surface intersected them; and, in fact, the manager was altogether in uncertainty which vein to follow, and how to work. In addition to this, in consequence of the dressing of the ore not being properly understood, the rich, rather soft, silver ore, through being mostly crushed into fine slime, was washed away; and what was saved consisted only of iron pyrites, blende and some galena poor in silver. These were the main causes of the failure of the first company; and though in my report I described the further opening of the mine (by a shaft outside the reach of the flood tide) as a legitimate and promising mining enterprise, laying stress upon the probability of occurrence of other veins and patches of the rich silver ore in depth, strike, and laterally, to be opened by drives north and south, and crosscuts east and west. Still the company dissolved and the plant was sold. The ore vein which you have now since opened, confirm only my first impression of the general richly metalliferous character of the formation. Those about one chain east of the shaft I consider, however, to fall within the category of those formerly worked. They are not true lodes, and cannot be depended upon for extent in strike and dip, and as to ore contents. Your proposed mode of opening them by a crosscut from the shaft, is no doubt the best one, and I should not be surprised if on breaking into and following them you find nests and strings of rich silver ore. I so advisedly nests and strings, for the reason that this is the general mode of occurrence of this class of ore; and according to all mining experience, nowhere has it yet been found comprising exclusively massive lodes, and but very rarely in larger accumulations within other lodes.

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Regarding the vein opened by the other three excavations about 200 feet west of the shaft. It resembles by its extent, fine hanging wall, and altogether better definition, a lode more than any of the veins to be seen about the shaft; though from analogy I should likewise not much trust upon its permanent character in depth. Still the fact that it is best defined as yet discovered in the ground, and moreover that you have found in the stuff worked out from the excavations, pieces of tetrahedite, renders it in my opinion specially worth being prospected. And this prospecting would likewise best be effected by a crosscut from the shaft, the driving of which would also form a capital mode of exploration of the country lying intermediate between the vein and the shaft. I am nearly certain that other veins, and likely of a valuable character, will be intersected.

Having herewith given you my observations about the mining features of this part of your lease, I need scarcely draw your attention to the fact that the mining work in such ground as that under notice requires especial care and intelligence on the part of the mining manager in regard to noticing and following all traces or indications of richer ores. The dressing of the ore stone for the saving of such an ore as tetrahedite demands also special attention - certainly far more than has been devoted to it by the first company. Classification by hand should, in my opinion, have a larger share in this work.

The next mining feature I have to notice is the massive outcrop of iron pyrites about 400 yards west of the shaft. This was altogether a new feature to me and I have to congratulate you upon its discovery. It consists, as far as I could see, of a lode like body of iron pyrites, the outcropping masses of which are distributed over a width of about 1½ chains, and extending from the low tide line up to and into the rise near the road, a distance of several chains. Here and there between the pyrites blocks there are masses of a hard brown chert or quartzite, which at nearly every place where broken showed fine specks and coatings of native copper. This chert is no doubt a product of alteration of the original gangue-matter, and native copper distributed through it is derived from decomposition of the iron pyrites, which evidently contains - i.e., the exposed portion - a certain, though perhaps only a small, percentage of copper. I have nowhere in the Australian Colonies seen so massive development of iron pyrites, and consider that for the manufacture of sulphuric acid alone its working should be profitable, whilst the copper contained in it, to be extracted from the residue, would afford additional profit. But independantly of this, there is I think, also a fair chance of its containing veins and patches of real copper ores, such as copper pyrites and hornite, and perhaps also of other more valuable ores. As far as the extent of your lease is concerned, the opening of this ore outcrop can unfortunately only be effected within reach of flood tide. The most advisable mode in my opinion would be by a shaft sunk about the middle of the lateral extent of the mass and as near to the road as possible. As an assay of the pyrites for gold, copper and silver would be highly advisable Mr. Cosmo Newbery could easily pick a fair sample from the bags of ore you shewed me at Lyell and Gowan's, i.e., supposing you approve of this suggestion.

I have now finally to report that I inspected under the guidance of Mr. Dale, the copper ore discovery, called the "Devon Consols", lying about 1½ miles southward from the last described ore outcrop on the beach. There is a mass of soft ferruginous gossan exposed on both steep slopes of the range bounding a small watercourse. The gossan contains abundantly distributed, more or less throughout its extent, fine fillaments and occasional larger plate-like specks of native copper. The quantity of this copper appears at first sight considerable, but, from

002 experiences of such occurrences, I very much doubt that it would pay to extract it. There are several shafts sunk on the gossan outcrop and in one, sunk on the northern hill-slope about 10 feet above the bottom of the gully, a body of iron pyrites, stated to be about 9 feet wide, was struck at a depth of about 9 feet containing larger and smaller patches of a black friable substance, which I was informed, consisted of black oxide and sulphide of copper, several assays of it having proved it to contain (if I remember correctly) from 32 per cent to 60 percent of copper. As I was for mineralogical reasons doubtful about the stated nature of the substance, I obtained from one of the shareholders on the ground a specimen, which he considered a fair average sample of the pyrites with patches of the black stuff enclosed. This sample was subsequently examined in my presence at Mt. Bischoff by my friend Mr. Morley, and I am sorry to say that the results proved that my doubts about the substance being oxide or sulphide of copper were well founded.

The mineral namely proved to be nothing else but a product of decomposition of the iron pyrites, containing only a small per centage of copper. The assays before mentioned must have therefore have been made of a different black substance than that given to me. As the rock in which the pyrites occurs seems to be similar to that on the beach in which your outcrop of this ore is enclosed, and considering the nature and trend of the latter, there is indeed some probability that both occurrences form part of one and the same massive lode which extends from the beach for several miles inland. The best mode of fairly and cheaply testing the nature of the undecomposed ore beneath the gossan would be, as I pointed out to Mr. Dale and the other shareholders, by adits to be driven on the course of the gossan into the bounding hills of the gully. The ore would thereby not only be well exposed, but above each adit there would also be a good height of backs, perhaps from 90 to 120 feet, available for stopping.

I remain, Dear Sir, Yours faithfully,

George H. F. Ulrich.

In the margin were the following remarks:-

- ① I don't think they do; James Bray declared them to be true lodes.
- ② We here found copper pyrites in large lumps.

Extracts from Reports of G. Thureau F.G.S. to the Tasmanian Government dated Hobart December 30. 1881.

- ③ The Penguin Silver Lead Mine was the first^③ that was discovered on the North Western Coast of Tasmania and some considerable amount of work appears to have been done periodically. These workings were all flooded, as this company's main shaft is subject to immersion at high water.

The country rocks are similar to those already described; in addition, a dyke of hornblende porphyry, interspersed by large patches of iron pyrites, traverses the ground causing probably the transmutation of the argillaceous deposit - deposits into hornstone, which occurs here in massive beds, made the more prominent on account of its containing native copper, in scaly and trackly forms. At low tide this coast presents a very peculiar appearance; ferruginous veins traverse the rocks there exposed to view, as occurring in several places and at various angles to each other; and in the eastern portions which appear to be more metalliferous than the remainder, huge blocks of hornstone and jasper crop out, containing large numbers of pyrites stained green, thus indicating the presence of copper along that channel of country.

The eastern lode in this company's ground has a strike of S. 26 degrees W., with an underlay of about 80 deg. W., at a distance of 124 ft. east of the main shaft; the vein matter is impregnated by silver-lead ores; blue and green carbonates of copper stain this formation and the adjacent strata.

④ In their main (whim) shaft, which is 70 ft. deep a vertical leader 14 in. thick was followed to the 60 ft. level from which depth some rich ores were raised. There is however a great deal of difference in the ores in these workings and those obtained by the adjacent Neptunea Co., because the former are mixed with copper pyrites; they are also very much richer in silver, and they contain less lead. The samples I was able to collect contained mostly "fahlores" or argentiferous grey copper ore embedded in quartz, calcite, and heavy spar, and all these were accompanied by a considerable percentage of iron pyrites. The eastern lode and the vertical leader in the shaft, run nearly parallel with each other; another leader was intersected 30 ft. west of the shaft, at the 60 ft. level, which gave rich ores, and in a winze sunk 30 ft. deep on its underlay a considerable improvement was observed. Still further west another surface formation was discovered beneath a "gossan" carrying galenites and fahlores. This vein is about two ft. wide and occurs along one good wall. It produced, beside the other ores, a little native silver in contiguity to the hornblende porphyritic dyke already referred to as containing native copper with associated ores and some 500 yards west of the main shaft.

Altogether the mode of occurrence of these various metalliferous deposits at the Penguin proved the place to be rich in valuable metals from a mineralogical point of view, and more so from assays constituting the basis of very satisfactory evidence in support of more extensive operations being undertaken at greater depths, either by means of ordinary mining operations, i.e. shafts, crosscuts, and levels, or as a preliminary, to employ the mining diamond drill which would perforate and prove the value of these deeper located deposits in a very short time, besides affording inexpensively, substantial proofs of their permanency in depth or otherwise.

III Cupriferaous Ores near Penguin.

⑤ The Watcombe Prospecting Co. have been engaged in tracing the continuation of the hornstones inland, which, it will be remembered, were described as being charged with copper, and its ores, and for this purpose a number of surface cuttings were made along the supposed course of same as observed by the compass. Indications were followed carefully as they presented themselves, and rough assay, made from time to time, one of which gave 5 oz. of silver per ton, and 3 per cent of copper, thus demonstrating that the "gangue" still remained metalliferous, tho' it was filled between the walls, which were 6 ft. apart with fragments of rock vein stuff. Subsequently, a prospecting shaft (5ft x 4ft) was sunk to a depth of 26 ft. (on the slope of the hill), in which the track of the lode was again out in the western end of the shaft; here it was enclosed in metamorphic schists interspersed with iron pyrites. The lode is composed of pieces of wall rock, bluish hornstone, and the vein matter shows traces of silver ore, copper, and iron pyrites, and stains from carbonates of copper. As these features repeat themselves near to, and for some distance along the surface, it would be judicious to test the deeper ground in preference to any more surface exploitation in future.

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One and a half miles south of the Penguin township the Devon Consols Copper Mining Co's. workings are located, 350 ft. above sea level, on a western tributary of the Myrtle Creek, which flows into the River Leven. The deposit which is being tested observes a strike of S. 66 deg. W. and is of quite a different character than any other I have observed in the vicinity. Several surface cuttings and two prospecting shafts sunk on the vein three chains apart expose the features of a well defined and good looking metalliferous deposit. This vein was discovered in the gully and on being found to continue on both sides of that water-course it was noticed that the "cap" was formed of an ochreous, porous and brittle rock, deep brown in colour. Curiously enough, native copper in long hair-like hexagonal prisms is defused throughout this substance presenting a very interesting feature. As the vein occurs in a dense green feldspathic porphyry, with large crystals of felspar, which however, nearer the vein becomes soft or "kindly" and steatitic, the development of the deposit in such country and under such favorable conditions, augurs well for the future at greater depths, as similar to other deposits.

Beneath this "cap" this vein 2 ft. in width, is parted into two ore-carrying bodies, a "horse" of greenish soft rock, strongly resembling the soft decomposed "lava dykes" of the Bendigo quartz reefs 1 ft. wide, occupying the centre. At a depth of 18 ft. the vein has become 5 ft. in width, having a slight western underlay, and every indication of forming eventually a strong deposit in depth. The intrusive mass, or "horse" disappeared at this depth and in place the vein becomes highly cupriferous in the centre of the formation. The ores consist of grey and black (soft) oxides of copper, mixed with particles of native copper; the former gave as per Mr. C. Newbery's assay 32 per cent of copper, or, the ore taken from the vein as it comes, 19 per cent to the ton, which is certainly a very satisfactory return; the ground can easily be worked in the initiatory stages by means of adits; a good and sufficient supply of water for mining purposes can be secured at reasonable expense, and useful timber is abundant on the ground.

In the margin were the following remarks:-

- ① This has not happened once during the ten years the the shaft has been sunk. The shaft is altogether unaffected by any sea water.
- ② The Neptune Co. is purely a lead mine. The Penguin ores are copper and silver.
- ③ This is a continuation of the large copper lode on the beach, vide plan attached to these papers.
- ④ Also a continuation of the lode exposed on the beach.
- ⑤ Prof. Ulrich was not aware of these assays when he wrote the last paragraph of his report.

Don River, October 10th 1881.

The Penguin Silver Lead and Copper Mining Company.

Gentlemen,

In accordance with instructions to report on the claim I beg to state that on arriving on the ground I found a shaft down 70 ft. and east of this shaft 3 separate lodes shewing very good silver and lead with a mixture of green chlorides and carbonates of copper and lime.

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These lodes are distinct from each other about 6 ft. and run north and south.

- ① West of the main shaft about two to three chains, there is another lode containing silver lead, which in my opinion will prove very rich when worked below the surface.

The third lode is a copper lode which crops up above the surface for a great distance. This lode contains very rich malleable copper, and this lode alone could pay the Coy. 30 per cent on an outlay.

The Coy. have only to sink the existing shaft 40 ft. and drive east and west thereby cross-cutting all the lodes in the eastern section of the claim.

All minerals on the Coy's. lease can be shipped to any port of Australia at very little expense. The lease is on the sea coast, and all the lodes can be traced on the surface towards the hills and beyond them for some miles.

It is my opinion that this mineral section is a property very valuable to the shareholders.

I am Yours &c.

(Signed) James Bray, Mining Manager.

Concerning the report of James Bray, I must remark that altho' he has great experience as a mining Captain in Cornwall, Peru, Chili and Australia and is a careful man of sound practical judgment, he cannot express his views in writing. After careful inspection of the leases, he told me that the formation east of the shaft consisted of three lodes, distinct from each other tho' only separated by a few feet. That they were easily accessible from the workings, and well worth driving into.

That the lode 200 ft. west of the shaft was a champion lode, having unusually strong walls and well fed by at least three large veins, which he traced to the hanging wall.

That the copper lode 400 yards west of the shaft was the largest formation of its kind that he knew of.

That all the lodes containing grey copper ore, rich in silver and likely to increase in quantity and quality below the surface.

That the lodes should be followed seawards and under the sea, where in his experience the best results had been obtained.

That the country tho' hard outside the lodes, was very kind inside them; and that he felt certain there were strong formations increasing in width below the surface and holding rich silver ores, with much probability that gold too, might be associated with the galenite; which happened in course of the operations when the mine was worked in 1871-72

Gilbert Elliot.

- ② Note. The Champion Lode shown on the plan.

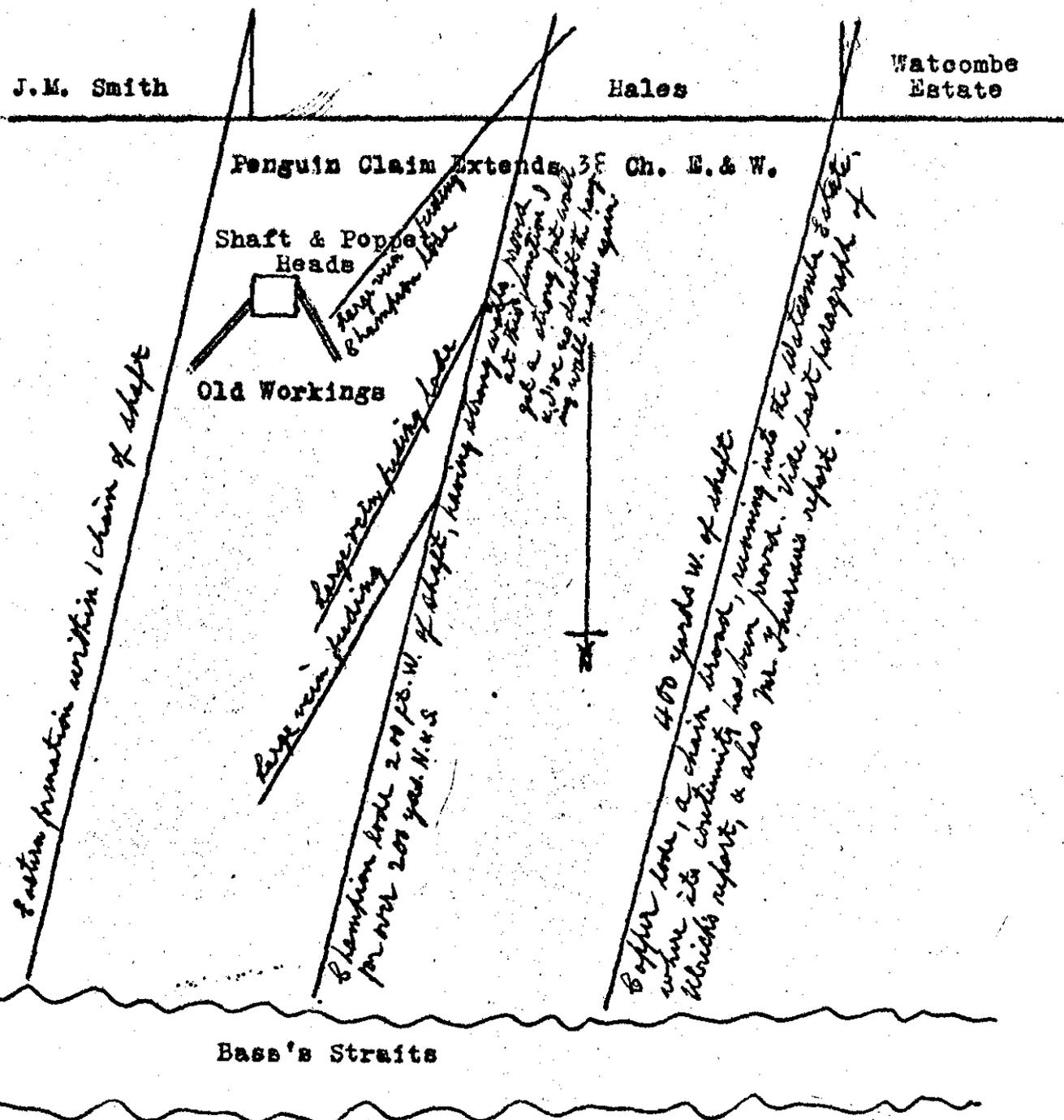
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J.M. Smith

Hales

Watcombe Estate



The 38 chains of E. & W. Beach, constituting the Penguin Lease is seamed by veins and lodes passing to the southward, where several companies are working inland on the continuity of the lodes, which have been proved to extend at least five miles south. Besides those shown above, there are many other veins and lodes which have not been explored.