TR3-36-42

The Stormont Bismuth Mine

by K. L. Burns

Location.

The Stormont Bismuth Mine is situated in the valley of the Lea River, about two miles west of Moina in North-West Tasmania.

There are two main groups of workings—the main workings on Castle Creek, a tributary of the Lea River, at 4026E-8903N, and workings near Fletchers Adit, on the bank of the Lea at 4032-8907.

Access.

An all-weather road from Moina crosses the Iris on a substantial bridge at 4053-8914. From there the old track described by Reid (1927) swings south-west, obliquely up the hill, while the present timber track climbs north-west, up the hill, then swings south-west along the Lea River-Ti Tree Creek divide, joining the old track at 4039-8905. The track junction is immediately north of a saddle, from which a track leads north-west down into the Lea River at Fletchers Adit. The main timber track ends at 4028-8092, with a wide overgrown track for the remaining 300 yards to the Castle Creek workings.

Previous Literature.

REID, A. M., 1927.—Stormont Bismuth Prospect, Moina. Unpublished Report of Tas. Dept. of Mines, dated 30.10.27.

SCOTT, J. B., 1929.—Stormont Mine, Moina. Unpublished Report of Tas. Dept. of Mines, dated 27.9.29.

BROADHURST, E., 1934.—The Black Bluff, Bell Mount, and Stormont Districts, 1934.

KEID, H. G. W., 1943.—The Moina Mineral District. Unpublished Report of Tas. Dept. of Mines, dated 18.10.43.

NYE, P. B., AND BLAKE, F., 1938.—The Geology and Mineral Resources of Tasmania. *Tas. Geol. Surv. Bull.* 44, p. 86.

General Geology.

The ore-bearing rocks are folded and faulted Moina Sandstone and shale, with overlying Gordon Limestone which has been converted in places to magnetite and garnet rocks.

There is a widespread superficial cover of Tertiary basalt and agglomerate, and Pleistocene fluviatile and talus deposits, which are of no immediate interest although the latter contains pockets of gold-bearing wash.

The bismuth ores occur as two types, disseminated orebodies and lode deposits.

Lode Deposits.

These outcrop on rock benches cut in the side of the Lea River near Fletchers Adit, which is about 200 yards downstream from the island in the river shown on the County Devon Mineral Chart. A little development of these has been done recently, on consolidated lease 80M/55 (P. Doyle), by E. Fletcher and K. Pickett, of Ulverstone. The most prominent lodes are numbered 1-4 on the accompanying plan.

Outcrop is restricted to the river banks, and present development has done very little to assist the natural exposures. However, it is clear the lodes strike north-west across the river, parallel to the small folds shown in the section, and the break-thrust through Fletchers Adit. The lodes in the quartzite tend to be en echelon in plan, and are tension fillings along the crests of small folds in the quartzite. The lodes in the magnetite rock occur in one member of a set of conjugate shear joints concordant with the synclinal axis.

No. 1 lode, the "Silver Lode", is several ramifying veins with vughy quartz, occupying tension joints in quartzite and a small fault. A narrow cut on the south bank has exposed two inches of coarsely crystalline sphalerite, galena, and chalcopyrite, with reportedly a little silver and gold.

Thirty yards west are weakly-mineralised gash veins, and about 10 feet east of No. 2 lode, a shale band in the quartzite is partly sericitised.

No. 2 lode occupies a small fissure, only a few inches wide. The ore is galena and chalcopyrite, with biotite and quartz gangue. The walls are white sandstone, speckled with aggregates of fine magnetite crystals and biotite.

Fletchers Adit is driven on a thrust fault, the east wall of the drive being Moina Sandstone, the back weakly mineralised skarn (magnetite) rock with some pyrrhotite on the dump.

5 cm

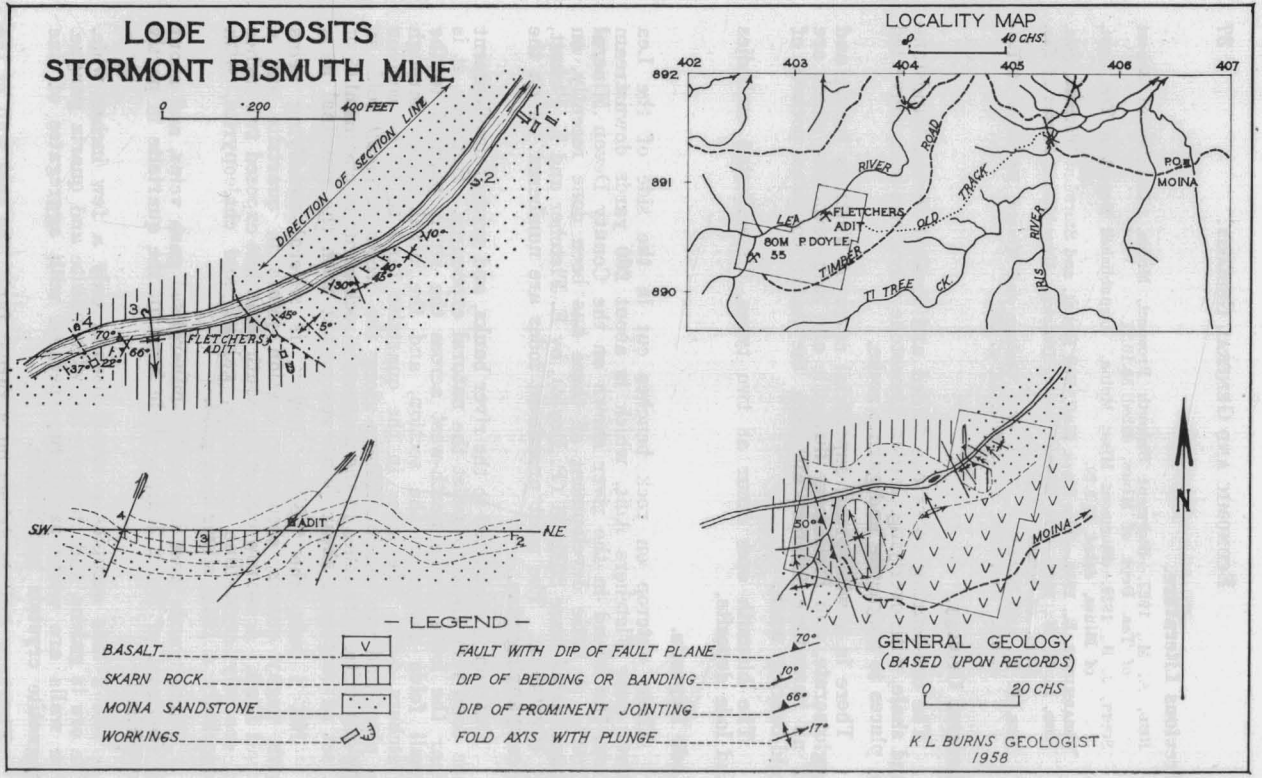

Figure 12

The magnetite rock extends from Fletchers Adit upstream to No. 4 Lode. It is banded, probably parallel to bedding, and contains pockets of large, well-formed oligoclase crystals and spherulitic chlorite. It is cut by a prominent fracture system of which the member striking 310° is occupied by numerous small quartz, magnetite and pyrite reefs averaging ½-inch width. No. 3 Lode is one of these, about four inches wide with coarse pyrite and black marmatite (sphalerite). The sphalerite, as in most of the lodes, and especially No. 1 Lode, acquires a blue iridescent coating on weathering.

No. 4 Lode is the most promising seen, and occupies a fault. Mineralisation in its vicinity extends over three feet on the northern bank, but the lode is either absent or very narrow on the southern bank, and a shaft sunk away from the river on the south bank failed to reach bedrock. On the north bank, the only worthwhile ore is concentrated into a 4-inch banded vein, the outer two inches mainly pyrite, with the inner two inches coarsely crystalline chalcopyrite, galena, wolframite, sphalerite, and periodically bunches of bismuthinite. The parts of the vein break cleanly from each other and the walls. A sample taken across the full vein width assayed 0.2 per cent bismuth with a trace of gold, while a sample from the central portion assayed 0.4 per cent bismuth with a trace of gold, which is as expected since bismuth is concentrated in the central portion. These values are quite uneconomic.

Prospects of Lode Deposits.

The widest and richest lode deposit, No. 4, is quite uneconomic, and all the lodes are valueless. This confirms the findings of Reid (1927) and Keid (1943). It has been shown that the lodes are related to minor structures concordant with the small scale folding—this control is so local that the lodes will be spasmodic and irregular in nature, and unlikely to persist. If the stronger and more peristent structures are examined, it is seen that mineralisation of these (the break thrust through Fletchers Adit and the fault through No. 4 Lode) is also of too low a grade and too narrow to be worthwhile. Further investigation of the lodes is unwarranted.

Disseminated Deposits.

The disseminated ore bodies are larger and more persistent than the lodes, and one, the Castle Creek orebody, has been worked. The future of the mine depends on these bodies.

Broadhurst classified the disseminated orebodies into flatlying bodies related to folding, and vertical bodies related to faulting. Mapping shows that the orebodies are parallel to bedding in the skarn rock—the skarn rock west from Fletchers Adit is the flatlying centre of a syncline, as is probably the orebody north-east of the Castle Creek workings. The Castle Creek orebody is almost certainly parallel to bedding, which is here steeply dragged against the fault just east of the open cut, giving a vertical orebody running obliquely into the fault.

The orebodies are restricted to the skarn rock, and reconnaissance shows the skarn rock is formed from only the lowest horizons in the Gordon Limestone (with, perhaps, the top shale beds of the Moina Sandstone: see Broadhurst, Keid). The ore is therefore stratigraphically controlled.

The various orebodies can be shown to occur in outliers of the basal limestone preserved in synclines or down-dragged wedges against faults, the strike of these structures being north-west. For the most part these are concealed beneath basalt, except near Fletchers Adit and in Castle Creek. Since detailed mapping could predict the position of the orebodies concealed beneath younger rocks, investigation of the mine area with this in view is well justfied.

Economics of Disseminated Orebodies.

A chip sample across about 12 inches of the face of the open cut above Fletchers Adit assayed 2.52 per cent bismuth, 4 dwts. 14 grns. gold per ton. Mapping suggests this is part of a fairly large flatlying disseminated orebody largely concealed beneath basalt talus on the south bank of the river west from Fletchers Adit. While the grade would not persist at this value, this orebody does warrant further exploration.

Keid (1943) gives production figures for the worked-out Castle Creek orebody, but, unfortunately, no gross tonnages are available to enable an estimate of grade to be made. Mr. P. Doyle has kindly supplied figures which include two assays of crude ore mill feed at 1.01 and 0.92 per cent bismuth. This orebody was worked marginally, but with oil flotation and higher metal prices to offset risen costs, an orebody of 1-2 per cent bismuth may be profitable today.

For record purposes, some figures supplied by Mr. Doyle, referring to the Castle Creek orebody, are appended.

Conclusions.

The lode deposits near Fletchers Adit are uneconomic, and it is extremely unlikely workable lodes will be found.

The disseminated orebodies in the skarn rock are much larger, and geological investigation to outline these and predict their occurrence under the basalt is warranted. The orebody largely concealed beneath talus on the hillslope west of Fletchers Adit, and exposed in the open cut above the adit, is the most suitable for immediate prospecting.

APPENDIX I.

Assays, Castle Creek Orebody, Stormont Bismuth Mine.

21.8.29—Crude ore mill feed Bi 1.01%.
Passed 7/16, retained on 1/4 Bi 0.56%.
Passed 1/4, retained on 1/8 Bi 0.96%.
Passed 1/8, retained on 1/16 Bi 1.04%.
Passed 1/16 Bi 1.07%.
Table Feed Bi 0.64%.
Jiggings Bi 1.6%.
Cencentrate Au 4:19:7 Ag 4.16:16 Bi 32.86%

Rock contains fair proportion of surface material and loam.

5.8.29—Average grade ore with a good percentage of surface material.
Mill feed Au Tr, Ag Tr, Bi 0.92%.
Jig feed No. 2 Bi 0.56%.
Jig feed No. 1 Bi 0.40%.
Table Seconds Bi 0.96%.
Jig Tails Bi 0.4%.

Shipments.

25.10.28—Bismuth Concentrate, 4 bags: 3 cwt. 3 qr. 10 lb.: Bi 66.8%, Au 5.36 oz., Ag 7.035 oz., Pb 7.8%.

21.1.29—4 bags, conc. 9 cwt. 2 qr. 5 lb. Bi 65%, Au 5 oz. 7 dwt. 4 grn., Ag 7 oz. 9 dwt. 0 grn., Pb. 1.5%.

30.10.29—Concentrate 430 lb. Bi 66.8% Au 5 oz. 9 dwt. 0 grn.; Ag 7 oz. 0 dwt. 0 grn./ton.

20.6.30—Concentrate 1069 lb. Bi 65%; Au 5 oz. 9 dwt. 0 grn.; Ag 7½ oz./ton.

7.8.30—Concentrate 575 lb. Bi 64%; Au 12 oz. 19 dwt. 0 grn.; Ag 9½ oz./ton.

1.9.30—Concentrate 562 lb. Bi 64%; Au 10 oz. 8 dwt. 16 grn.; Ag 11 oz./ton.

1.10.30—Concentrate 588 lb. Bi 62.6%; Au 10 oz. 9 dwt. 0 grn.; Ag 9¾ oz./ton.

6.11.30—Concentrate 630 lb. Bi 64.4%; Au 21 oz. 4 dwt. 16 grn.; Ag 11¾ oz./ton.

10.1.31—Concentrate 586 lb. Bi 64.27%; Au 21 oz. 7 dwt. 0 grn.; Ag 10 oz./ton.

17.1.31—Concentrate 606 lb. Bi 65.81%; Au 21 oz. 13 dwt. 12 grn.; Ag 10.6 oz./ton.

21.2.31—Concentrate 586 lb. Bi 64.83%; Au 12 oz.; Ag 7 oz./ton.

9.3.31—Concentrate 597 lb. Bi 64%; Au 9 oz. Ag 9 oz./ton.

6.2.31—Concentrate 588 lb. Bi 64.83%; Au 12 oz.; Ag — oz./ton.

6.5.31—Concentrate 643 lb. Bi 67%; Au 11 oz.; Ag not assayed.

7.9.31—Concentrate 588 lb. Bi 56.68%; Au 40.3 oz./ton.

24.11.31—Concentrate 633 lb. Bi 60.37%; Au 33 oz./ton.

16.4.32—Concentrate 645½ lb. Bi 62.74%; Au 13.94 oz./ton.

9.9.32—Concentrate 714 lb. Bi 64.38%; Au 12.58 oz./ton.

15.11.32—Concentrate 694 lb. Bi 53%; Au 11.2 oz./ton.

14.2.33—Concentrate 702 lb. Bi. 60.35%; Au 10 oz./ton.

31.3.33—Concentrate 691 lb. Bi 58.3%; Au 12.27 oz./ton.

13.4.34—Concentrate 318 lb. Bi 51.23%; Au 15.54 oz./ton. Ag not assayed.

APPENDIX II.

by G. Everard.

The following specimens were collected by Geologist K. Burns at the Stormont Bismuth Mine, Moina:—

Opposite Fletcher's Adit.—Mass of quartz crystals cemented with limonite and containing spherules of chlorite.

Opposite Fletcher's Adit.—Glassy greenish felspar and carbonate of the same colour. On refractive index, the felspar is probably oligoclase.

Near Silver Lode.—Fine-grained rock made up of minute needles of actinolite.

2 *Lode.*—Dark spots and bands consisting of masses of minute crystals of magnetite in white sandstone. Small books of biotite are present also. The black mineral in the other specimens is biotite.

Fletcher's Adit.—Pyrrhotite.

Silver Lode (1 Lode).—Vein quartz containing sphalerite, with a bluish iridescent surface.

Skarn Rock opposite Fletcher's Adit.—The rock contains a quartz vein carrying magnetite and a little pyrite.

3 *Lode*.—Vein quartz with pyrite and black marmatite sphalerite.

4 *Lode*, near Fletcher's Adit.—Several pieces of lodestuff carrying pyrite, sphalerite and galena.