Old Mines in Limestone

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Montagu No1.

① Location and Access.

The old Montagu No 1 mine is situated on the northern side of the Austral Valley, 50 chains up the valley from the Smeltus Road. It lies 70 chains south-west of the Zeehan Railway Station.

The remains of an old wooden tramway can be followed from the Smeltus Road to the mine.

② History.

This area came within the scope of the South Balstrup Company floated in 1890. This company sank a shaft to 140 feet and had just cut galena when orders were received to close down.

"Some rather nice-looking galena mixed with siderite was lying near the shaft" ①

This shaft has been lost sight of, not even having been recorded by Waller in 1903. About 1894 O'Rourke started work to the eastwards of the old shaft and opened up good ore by driving adits and sinking winzes therefrom.

In 1896 a group of leading mine managers and local citizens at Zeehan formed a company to exploit O'Rourke's discoveries in depth. This was the Montagu No1 Company which sank a Main Shaft to 200 feet and opened out levels at 124 ft and 195 ft.

① A Montgomery "Report on Progress of Mineral Fields of County of Montagu" 1893 p 20.

The Company ceased work early in 1898. In 1899 a tribute party were working the accumulated dumps.

In 1903 T Currie held the section and opened up a group of cross bodies north of the old Adit workings. These sporadic discoveries and working continued up to 1905. Since then the area has remained neglected.

(3) Output and Profit

Accurate statistics are not available, but in all about 1500 tons of galena were produced. O'Rourke did well and made a modest competence. The Montague No1 Company did not pay a dividend but built up an effective plant from profits.

Tenghidal and party treating the dumps just about made wages, but T. Currie did well for two or three years

The ore actually sold by the Montague No1 Company was only a small fraction of the total ore produced. Except for the clean galena bands this ore was useless to them because of its disseminated nature and the presence of zinc, but it is valuable ore under present-day conditions.

(4) Geologic Environment.

(a) The Limestone Bed.

Our knowledge of established fact is at present confined to the existence of limestone in the shaft from about 140 feet downwards and in the east crosscut at the 195 ft level.

The shaft is located just north of the Balstrup Tear Fault and is therefore just within the Silurian rocks which are truncated southwards and brought into juxtaposition with the older slates & tuffs by the action of that fault

The limestone can thus be expected to continue beneath the overlying sandstones outcropping at the surface to the east, north and west. Westwards it is truncated by the Waller Upthrust which meets the Balstrup Tear Fault at Ruby Corner approximately 800 feet west of Montagu No1 Shaft.

Very little more can be said about the limestone bed in this locality at present. It is Block g of the original structural reconnaissance map. Based on the evidence of the overlying sandstones the dip of the limestone bed is probably at a steep angle to the north-east.

(b) The Waller Upthrust

This is located about 800 feet west of the Montagu No1 Main Shaft and forms the western limit of Block g. From its junction with the Balstrup Tear Fault at Ruby Corner it runs somewhat west of north, being represented by a mineralised zone which invades both the Silurian sandstone and grits and the adjacent slates and tuffs.

"On the southern side of the Comstock tramway this lode traverses conglomerate, and there is an impregnation of this rock with scheelite for some width." (2)

(c) The Balstrup Tear Fault.

The existence and position of this master fault as plotted on the original structural reconnaissance is confirmed by Professor Carey's photogeological interpretation map. It is probably practically vertical but this needs further confirmation.

It is important to note at this stage that Professor Carey has added another fault in this vicinity. It runs from the neighbourhood of the Foam Shaft in a direction slightly north of east and coalesces with

(2) Geol. Surv. Tas. Bull 8 p123.

the Balstrup Tear Fault at Ruby Corner. This adds to the significance of Ruby Corner.

(d) Meridional and Transverse Fractures.

Both to the east and west of the Main Shaft drives have been worked along galena concentrations which apparently occupy fractures orientated at about 320°. These were quite productive in the sandstones but down at the limestone level they were not sufficiently productive for profitable operations.

In addition to these fractures, work carried out by T Currie after the Company ceased operation disclosed a series of lodes running parallel to the Balstrup Fault.

"Last week's work on Mr T Currie's section (late Montagu or South Balstrup) produced some very nice patches of ore up to a foot wide. The lodes from which they were obtained appear to be of a different series to those worked by the former companies. These were north and south lodes, but the present are east & west lodes, to the north of the Main Shaft, and running with the strike of the hill, or the slope of which the shaft is situated. The original holders put in a main adit which was subsequently sunk through in the shaft, and by extending this 75 ft, the first east and west lode was cut, 40 ft below the level of the shaft collar. The lode averaged 3 in. or 4 in. of metal in picking ground and has assayed 900 oz Ag & 75% Pb for the last parcel of 10 tons, and there are about 30 or 40 tons at grass, estimated to yield 1 in 5 or 6. A parallel lode has been cut in a drive 40 ft above" (4)

(4) Z & D Herald 13/10/1903.

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" In the south-east corner of the section there is a large carbonate of iron lode, carrying fair seconds, which has been driven on for some distance north from the creek. This lode is a promising formation." (3)

(3) G.A. Waller "Report on Zeehan Silver-lead Mining Field" 1904 p 94.

The workings at neither the 124 ft or 195 ft levels were far enough north to reach these east-west fractures and their effect.

(5) The Ore-bodies

(a) Fissure Fillings.

The two lodes to the west and the two lodes to the east of the Main Shaft, where they have been worked in the sandstones, seem from the available descriptions to have been typical Zeeton fissure fillings. The same applies to the two east-west lodes worked by Currie.

The distances driven on these lodes has not been great, the maximum being 260 feet on No 1 East lode.

Down in the limestone it seems to be indicated, from what references are available, that these lodes behaved differently and were of a different character. Waller has this to say:-

> "A crosscut was driven from the shaft, to cut O'Rourke's lode, with very poor results. It is difficult, now, to get the whole facts of the case. Several of the men who worked for O'Rourke tell me they are convinced that O'Rourke's main lode was never cut in the bottom level, but only a parallel lode some distance to the west. They are very positive as to the presence of the streak of metal below O'Rourke's workings, and they say this metal was never seen by the Montagu Company." (5)

The probable explanation is that the lower level

(5) S.A. Waller: "Report on Zeeton Silver-lead Field" 1904 p 94.

being in limestone showed characteristic replacement ore and not the 'lode' features of the fissure fillings.

(b) Replacement Ore-body

Although there is no doubt about the existence of a replacement ore-body in the limestone, nothing is known as to its extent because the mine workings only penetrated the edge of it. The evidence establishing the existence of the ore-body is supplied by the nature of the ore in the dump and by the following description:-

"The main shaft is sunk 200ft, the bottom level having been opened at 195 ft. The eastern crosscut is driven 161 ft passing through a considerable amount of mineral matter, similar to what was met with in sinking, consisting principally of carbonate of iron, zinc etc considerably mixed up with broken country. At about 50 ft from the shaft, however, a small vein was intersected, which contained some very rich galena, assaying 200 oz per ton, but not in sufficient quantity to pay for driving. At 100 ft the crosscut entus soft decomposed puggy material, which gave a good deal of trouble in driving through its swelling and sinking, double sets of specially large timber having to be used. Further on the formation contains a little ore, and is driven on northwards for about 50 ft, but becomes broken by a poor lode of mixed material that crosses diagonally. In the drive southwards the formation contains ore

distributed for a length of 45 ft, which is being stoped out by a pass. Beyond that point the drive enters hard rock, and continues to be blank for 75 ft, while within the last 14 ft a nice stope of high grade ore was met with. The vein is from 1 ft down to 3 in. in thickness. It contains about 75 per cent of clean ore, of which a map sample showed on assay Pb 75%, Ag 190 ozs. The whole lode formation is about 3 ft between the walls, the ore vein being on the western side and the barren portion consisting of platey matter containing veins of carb. of iron and quartz. This is a continuation of the same vein of ore found in the upper level, only that it has been met with earlier than was expected, which thus shows that it is lengthening downwards and pitching northwards on its strike. In the upper level it continued for a length of 60 ft on the floor of the drive, but in the stopes overhead ran out to an apex in a height of 30 ft.

In crosscutting, various mineralised formations (in some instances containing a little scattered ore), have been passed through, a circumstance which gives the impression that at existing levels merely the cappings of large mineral bodies are being penetrated. (6)

It would thus appear that to the east of the Main Shaft the replacement ore-body extends well south of

(6) Z + D Heald 26/11/1897.

An interesting and important phase of the mineral constitution is the high Ag : Pb ratio. Assays of clean galena have given up to 200 ozs Ag. The silver ratio thus ranges up to about 3.0.

the crosscut. This is in concordance with the fact that at the Montagu Nol the Balstrup Tear Fault swings locally from its general strike of 275° to a strike of 300°.

Thus it can be expected that a due west crosscut would pass out of the ore-body as it approached Ruby Corner. The exploration of the ore-body in this direction must therefore be by a crosscut on a bearing of about 290° to be still in the limestone zone at the intriguing Ruby Corner.

Very little distance north was penetrated by the lower workings. Consequently we know nothing of the extent of the replacement ore-body in this direction. But the existence of the east-west lodes in the sandstones to the north, points to the possibility of extensive and intensive mineralisation northwards in the limestone.

(b) The Ore

(a) Constituent Minerals.

The mullock dump shows the general range of ore-types except of course the higher-grade ore which has been selected and sold.

The metallic minerals are galena and sphalerite. Gangue minerals are manganosiderite and quartz.

(b) The Ore Types.

The prevailing ore-type in the dump consists of dominant galena with subordinate sphalerite in a groundmass of manganosiderite and quartz. The groundmass as a whole is soft enough to be scratched with a knife. Therefore it would seem that silica replacement is subordinate to that of manganosiderite. The quartz, however, is developed

in the vughs as clear crystals.

Another type consists of galena + sphalerite + siderite — manganosiderite + limestone. The metallic minerals occur as bunches and veins in the unaltered limestone.

Still another type is indicated by the report of black pug at the 195 ft. level. This probably represents the manganocalcite phase of replacement with accompanying galena + sphalerite. It is noteworthy that the two previously described types are hard to break being tough rather than intensely hard, but the manganocalcite type even at the 195 ft level has broken down to soft black pug.

(c) The Concentrations.

These are what have been driven on in the endeavour to mine at a profit. They were sufficiently concentrated to provide picked ore of 60-70% Pb by selective mining, trapping and hand-picking. There was never a concentrating plant at the Montague No 1. The dumps have since been gone over using hand-picking and hand jigging.

The widths of these concentrations seem to have varied from a few inches up to 3 to 4 feet with a maximum apparently of 9 feet. They are apparently discontinuous both horizontally and vertically.

The actual metal contents of what at present remains on the dumps are unknown as this dump had not been sampled when cessation of dump stamping was ordered. Nevertheless by visual examination it could be profitably milled under existing conditions. This is of course only what is left after having had the eyes picked out of it.

(7) Mine Workings.

(a) Adits.

Altogether there are five adits. Four of these were put in by O'Rourke from just above creek level. The fifth was driven by Currie in 1903 about 5 ft above and to the east of the Main Shaft collar.

Currie also extended the old No 2 Adit an additional 75 ft and cut an east-west lode. The length of No 5 Adit is unknown, but it cut another east-west lode.

No 1 Adit is 150 feet in length. No 2 Adit as extended by Currie is 300 feet. No 3 Adit is 65 feet and No 4 Adit 120 feet in length. The workings from these adits are known as the 35 ft level.

(b) Shafts

The Main Shaft is 11' x 5' in the clear. It is 200 ft deep, the last 5 feet being the sump. It is apparently in good condition as the collar is standing and would probably only need timbering down to water level (35 ft level).

O'Rourkes shaft was sunk from the surface through the 25 ft level from No 3 Adit and ultimately reached the 124 ft level from the Main Shaft. It is small — 6' x 4'6".

(c) Crosscuts and Drives.

The east crosscut at the 124 ft level is 210 feet in length. The north drive on No 1 lode East is 60 ft and the south drive 210 ft. No 2 lode east has been driven on 50 ft south at which point a crosscut connects to the south drive on No 1 lode East 50 ft in length.

The east crosscut at the 195 ft level is 161 ft in length. Driving was mainly to the south being

upwards of 200 feet in that direction.

There has been no crosscutting west from the Main Shaft.

(8) Discussion of Possibilities.

The definitely established occurrence of replacement ore carrying lead, zinc & silver values indicates tangible possibilities. These are clearly enhanced when the geologic structure is taken into consideration.

The Balstrup Tear Fault forms the southern face of the buried limestone block q. The Waller Upthrust intersects the Balstrup Tear Fault 800 feet west of the Main Shaft and forms the western face of the limestone block. The Manganese Reverse Fault impinges on the meeting point of the Balstrup Tear Fault and the Waller Upthrust. In addition, into this meeting point at Ruby Corner there comes the fault depicted by Professor Carey.

Such a concentration of structures must surely point to the possibility of intensive and extensive mineralisation of the limestone. This mineralisation can be expected to spread into the limestone from the Ruby Corner focus eastwards, northeastwards, and northwards. The Montagu No1 workings are in the southern edge of the eastward extension.

(9) Recommendations.

The Montagu No1 presents an excellent opportunity to see and explore the replacement deposits in limestone at a depth of 200 feet. The unwatering and reconditioning of the Main Shaft

would allow examination of the replacement ore already penetrated. Drives westwards to Ruby Corner and eastwards beyond the existing crosscut would be the base for systematic drives into the hanging wall northwards.

In addition, once having reached Ruby Corner in crosscut at the 200 ft level, we would be at an excellent strategic point from which to explore the whole vicinity of the Ruby Corner focus. It will be remembered in this connection that in the very limited surface exploration in this vicinity the very rich niccolite-pyrargyrite vein was disclosed at a depth of 20 ft.