

REPORT ON THE MAGNET MINEMAGNETINTRODUCTION

The Magnet Mine was last examined in 1922, and a complete report thereon was prepared, and is embodied in Bulletin No. 33 - The silver-lead deposits of the Waratah District. A full description of the mine will not be repeated here but the report will be devoted to workings carried out since 1922, and occurrences disclosed thereby.

MAIN LODENo. 15 Level

The No. 14 level was the lowest one in the mine in 1922 and the crosscut had only reached the lode at the time of the writer's visit. Since then the shaft has been sunk a further 200 feet to allow of Nos. 15 and 16 levels being driven. At No. 15 level the crosscut has reached the lode a small amount of driving north and south has been carried, and a small amount of stoping performed. The No. 16 crosscut has not yet been commenced.

The same general conditions exist in the crosscut, as in those of the levels above, until the vicinity of the lode was reached. The Dundas slates and breccias were passed through until within a short distance of the lode, when as usual, they were succeeded by country necessitating timber, and the altered Websterite was entered. It was anticipated that the lode would be intersected at 425 feet, but it was not actually reached until 460 feet. On driving and stoping south it was found that the footwall of the lode turned to the east, and came back to the position where it was expected to be. The occurrence of the lode in the crosscut at a different place to where it was expected was thus only a local feature. The footwall has a more westerly bearing at this point than at the levels above and meets the hanging wall further south than usual. This is just one of the little irregularities common to lodes and there is no strict geological explanation of it.

No. 14 Level

The block of ore of the main lode has been stoped out overhead up to No. 13 level.

The hangingwall drive is being driven south on a few veins of ore which occur under the dolomite hanging-wall.

No. 13 Level

No work is being done on the Main lode at present, and the ore has been stoped out up to No. 12 level.

Nos. 12 and 10 Levels.

No work is being performed on the main lode at these levels. No. 12 lode is sealed off in connection with the drainage of the mine.

No. 9 Level

A new south footwall drive has been put in readiness for stoping ore in the old stopes between Nos. 9 and 8 levels, and three ore passes have been connected with the stopes.

Two new south central drives have been driven in the Main lode in second grade ore, and are opening up a large block of this type of ore for stoping.

No. 8 Level

A long drive has been driven from the Main cross-cut to the bottom of a rise which connects it with south adit. This drive was commenced in footwall country and had a general bearing of 210 degrees. At a distance of 375 feet from the cross-cut the old footwall drive and some connected workings were struck. The drive is in somewhat altered igneous rock all the way and contains veinlets of dolomite at intervals. Generally the nature of the rock cannot be distinguished in hand specimens satisfactorily, but it is undoubtedly altered websterite. At some points the foliated bastite alteration product is present.

In the beginning of the drive any veins of ore present were followed, but further south heads and walls were followed.

The rise to the south adit connects with a short drive several feet to the east of the dolomite hanging wall, and the lode channel under it at the level of the south adit. At the south adit the winze is therefore east of and in the footwall of the lode. Unless the winze passed through the dolomite hanging wall between the adit and No. 8 level the bottom of the winze at the latter level should also be in footwall country. The bastite at the face of the No. 8 drive confirms this view. The No. 8 drive would therefore appear to be in its southern portion to the west of the dolomite hanging-wall.

Short cross-cuts to the west would intersect the dolomite hanging-wall and show if there is any ore under it as in the south adit. If these crosscuts were extended a further 30 feet they would prospect any southerly continuation of the New Lode.

The old workings cut by the new south drive referred to above, consist of a drive to the south west and portion of an old drive to the north with a rise through the stopes. In the angle between the new drive and the south west drive some fine grained galena is exposed. Another lode runs from the rise to the old stopes in a south westerly direction across the old south west drive. To the west of the lode dolomite and dolomitised rock occur with some very coarse grained dolomite in the face.

It is difficult to determine the relation of this lode exposed here. It is undoubtedly the southern portion of the whole or part of the main lode, and the dolomite rather suggests the hanging-wall portion thereof. The very definite hanging-wall of the lower levels cannot be recognised however, and this rather supports the view that the general characteristics of the Main lode alter about the Nos. 8 and 9 levels, being different above and below these levels. This applies particularly to the definite hanging-wall of dolomite and the important footwall orebody of the Main lode which are characteristic of the lower levels. The exact characteristics at and above No. 8 levels cannot be sufficiently determined

owing to most of the old workings having closed in.

South Adit

The southerly continuation of the dolomite hanging-wall was cut in this adit when it was driven some years ago. Since the rise from No. 8 level was connected a short drive north has been put in to prospect the lode. It was driven in the footwall country to the east of the lode until the hanging-wall was met, when the lode was followed. A small quantity of ore (galena and blende in a carbonate gangue) is shown in the face. This lode represents the southerly continuation of the lode worked in the upper levels. Judging by the bearings of these levels the lode had a general bearing of 30 degrees and such a one would connect the lode in the south adit with that worked in, say, No. 5 level which is about the level of the south adit. The characteristics of the lode near the surface are different to those at depth, but cannot be determined owing to lack of facilities for examination.

It undoubtedly has a bearing of about 30 degrees and was much longer than at the lower levels. Judging by the plan the lode was longest at No. 1 level, and possibly Nos. 3 and 7 levels, and actually extended towards the south adit. As to whether any shoots of ore will be found between the south adit and the south end of No. 5 level cannot be stated and is a matter that can only be determined by prospecting. Ore certainly occurs at the south adit, and thus the continuation of the drive to the north is legitimate prospecting.

No. 3 Adit

This adit was driven in a direction about the level of No. 3 level and from a point midway between the entrances of No. 2 South adit and No. 4 adit. Slates and breccias of the Dundas series are exposed in the approach and the websterite dyke rock in the entrance to the adit. Weathered websterite was passed through, several narrow gossanous formations being intersected in it.

Drives were driven north and south on a lode at 220 feet and further west another drive north has a winze being sunk from it which is being connected to No. 4 level.. Ore containing galena and sphalerite is being passed through in this winze.

The adit continues past these formations for 200 feet the following being passed through

Dolomitised igneous Rock
 Soft reddish decomposed material.
 Jointed and decomposed igneous rock
 Fresh, jointed diabase porphyrite
 Orbicular rock (probably websterite)
 Decomposed diabase porphyrite
 Fresh diabase porphyrite with a few veins of
 calcite.

In the south drive from the adit, a formation containing narrow veins of metal was followed the walls consisting of weathered and dolomitised rock. After 200 feet the drive was turned to the west and continued as a crosscut. Several gossanous formations were intersected towards the face one of which was driven on both to the north and south. This probably represents

one of the formations cut in the adit. Harddolomitised rock with veins of dolomite and narrow veins of gossanous material, continues to near the face where variolite comes in.

New Lode

This lode has been exposed a short distance to the west of the hanging wall of the main lode and parallel thereto.

At the time of the writer's visit in 1922 this lode had only been cut at two levels viz. Nos. 9 and 14. At No. 9 level the ankerite hanging wall was not definitely defined and some of the workings appeared to be to the west of it. A winze had been sunk from one of the short crosscuts on a formation carrying one or more veins of fine grained galena, but no stoping had been carried out on this formation.

The continuation of the No. 14 crosscut had also exposed a formation carrying veins of metal west of the hanging wall. A nine inch vein of the fine grained galena gave an assay of 70% lead, 130 ounces of silver to the ton. It was then stated that such veins should be followed and that short crosscuts from the hanging wall drives would easily prospect the continuation of these veins. Since then a large amount of prospecting work has been carried out with satisfactory results. The full extent of the workings and occurrences on this lode are as follows.

No. 15 Level

The main crosscut intersected the main lode at 460 feet and passed through 16 feet of lode, intersecting the hanging wall of white dolomite, and passing through 11 feet of ankerite and ankeritised rock. It then passed through the new lode the formation of which was five (5) feet wide, and carried several veins of fine grained galena. A few feet of dolomitised rocks occur to the west of the lode and makes an irregular junction with the variolite in the face. The dolomite hanging wall has a bearing of 65 degrees and a dip to the north west of 66 degrees. The new lode has a strike of 46 degrees and a dip of 40 degrees to the NW. If these bearings continue the new lode would junction with the dolomite hanging wall to the north east - a feature which does not exist at any of the levels above No. 15. Whether this will be so, or is only a local feature, will be revealed when further development work is carried out.

An assay from a four-inch vein in the new lode assayed 200 ounces of silver per ton.

No. 14 Level

The new lode was cut in the extension of the crosscut in 1922 as described. Since then another crosscut has been driven further to the north east, and short drives from it, put both ways along the lode. These works exposed the lode at a point 170 feet to the north east along its strike from where it was cut in No. 15 level. The lode is here parallel to the dolomite hanging wall (bearing 40 degrees) and 15 to 20 feet to the north west thereof.

No. 13 Level

A greater amount of driving has been done in the

lode at this level than at any other. The lode was cut in a crosscut driven from a northerly drive off the main crosscut. After passing through the lode, the crosscut continued until the variolite was exposed 10 feet to the northwest.

The New lode is parallel to the Dolomite Hanging wall and is 20 feet to the north west thereof. It was cut at a point 115 feet along the strike to the north east of the point of intersection in No. 14 level.

The lode was driven on both to the north-east and the south-west, the total distance being approximately 200 feet. At the south-west face ore is exposed in the bottom of the face but not in the top. The the north east the formation varies from 3 to 30 feet the metal values also varying from point to point. Near the crosscut the lode is 3 feet wide and rests on a footwall of dolomite and dark dolomitised rock. At a distance of about 100 feet the ore makes over on to the hanging-wall, and 10 feet from the footwall. The drive was then turned to intersect the hanging-wall and followed it. In the face "seconds" were showing after a short blank had been passed through. A stope has been opened out above the central part of this north east drive, and shows good grade ore. The ore here is different to any other part of the New lode. It consists of galena, sphalerite, and the brownish manganese-siderite, typical of the main lode is exactly similar to the ore of the latter lode.

The continuation of the lode to the south west at this level could be easily prospected by one or more crosscuts north west from the hanging-wall drive.

No. 12 Level

This level is at present sealed off in connection with the drainage of the mine, and no prospecting work is being carried out. A short crosscut was driven off the hanging-wall drive but did not continue far enough to intersect the New Lode.

With the lode existing at Nos. 11 and 13 level there is no reason to expect that it would not be cut at this level.

This level offers great facilities for prospecting for the New lode if all the old drives are accessible. The north hanging-wall drive, the south hanging-wall drive, and the west crosscut off the south central drive provide points of attack over a length of 800 feet. Short crosscuts from the former two drives and an extension of the latter would quickly intersect the channel of the New Lode.

No. 11 Level

The main crosscut was extended through the dolomite hanging-wall and cut the New Lode. The lode was driven on to the south west for 175 feet and is parallel to the dolomite hanging-wall of the main lode. The ore was generally directly underneath the hanging-wall, but occasionally it made in the white dolomite to the east. No ore occurs in the drive in the last 15 feet. The face consists of nearly all white dolomite and a little green dolomitised rock and shows several walls dipping westerly.

The lode was cut at a point just above (up the dip) from where it was cut in No. 13 level, and though driven on south for 175 feet, the face is still 100 to 200 feet north west along the strike from where the lode is known to occur in Nos. 15 and 14 levels. Thus, unless

there are one or more shoots of ore with steep pitches to the south west, it is reasonable to expect ore south of the face in this drive.

About midway along the south west drive, a rise on the lode connects with No. 10 level.

No. 10 Level

A crosscut was extended west through the dolomite hanging-wall and a drive was driven south from it. This encountered old workings on the dolomite hanging-wall. No ore was exposed in the south end of the drive but a vein six inches in width made in the top of the face. A short crosscut west cut New lode where fairly poor and it was then stopped back alongside the first drive. A rise on the lode connects with the winze from No. 9 level. A winze almost immediately below this connects with the rise from No. 11 level. At the north end of the drive, the ore was followed, the hanging-wall of the New lode being kept on the western side. This hanging-wall appears to turn and run to the north west and a cave occurs to the west of, and ahead of the drive. The ore, however, seems to occur under a wall in the face which represents a true continuation of the true direction of the lode. This ore rests on a good footwall which however, has more ore to the east of it, and may represent the hanging-wall of the Main lode.

No. 9 Level

No further work has been done on the New lode at this level except to make new access to the top of the old winze and the connection of the latter with No. 10 level. In the winze the lode has been left intact underfoot, three feet of dolomite and dolomitised rock on top of the ore, under a good hanging-wall being removed.

Above No. 9 Level

No recent prospecting work has been carried out above No. 9 level in connection with the New lode. The only crosscuts west of the hangingwall drives, at the upper level are, two at No. 6 level.

The writer made a hurried examination of one of these in 1922 in the parts where it had not fallen in. The examination was hurried and no narrow veins were detected though they may have been missed near the hanging-wall drives, owing to the falls of rocks etc. It is probable that the New lode exists above No. 9 level and may be easily revealed by prospecting. One point to be remembered however, is that the dolomite hanging-wall seems to become less defined (judging by the exposures at Nos. 10 and 9) in the upper levels and it is just possible that the upper part of the New lode may have been stopped as portion of the Main lode.

The New lode has thus been exposed at all levels from No. 9 to No. 15 except No. 12 (where however, it will without doubt be found. It is parallel to the dolomite

hanging-wall of the Main lode and is 15 feet to 30 feet to the west thereof. It will therefore have a general strike of 30 degrees and a dip to the north west of 55 degrees.

The lode consists of veins and patches of galena and sphalerite in a formation with a width ranging up to 10 feet. The galena is generally fine grained and has a much greater silver content (100 to 200 ounces per ton) than the coarse grained galena of the Main lode. This fine grain of the galena may be due to the higher silver content, a state which is repeated in other parts of the world. The blende or sphalerite is the usual dark variety (marmatite). The gangue consists of dolomitised igneous rock, the white dolomite (or ankerite) of the hanging-wall and a carbonate slightly different to this ankerite. This carbonate is probably of similar composition to the ankerite but seems to be restricted to the New lode, and portion of the veins of the Main lode immediately under the dolomite hanging-wall. The ore resembles that of the main lode at only one locality viz; the stopes at No. 13 level where coarse grained galena and mangano-siderite are present.

The lode occurs in the zone of dolomite associated with and west of the dolomite hanging-wall of the main lode. The relations of ore and dolomite are such that the ore is either contemporaneous with the dolomite, or what is more likely is prior to it. The ore and mangano-siderite of the main lode are definitely earlier than the dolomite which has replaced them. The ore and carbonate of the New lode may represent another phase of the mineralising solutions different to those which formed the Main lode. There is another possibility however, viz: that the New lode was formed by the same solutions of the Main lode (this certainly was the case at one portion of No. 13 level) but that the later solutions which formed the dolomite or ankerite traversed the channel of the New lode and altered its nature by chemical re-action. This alteration consisted of the formation of fine grained galena rich in silver in place of the coarse grained galena, and the alteration of the mangano-siderite to a carbonate probably of the nature of ankerite. The enrichment of the galena is difficult of explanation unless an additional silver was introduced by the ankerite-forming solutions. An ore similar to that of the New lode occurs in some portions of the hanging-wall veins of the Main lode. These veins are close to the zone of the ankerite and have the same bearing of the New lode and evidently have been formed by the same processes as the New lode.

The New lode, although it cannot be compared in size and importance with the Main lode, represents a decided acquisition to the Magnet Mine. It has so far been exposed from No. 9 to No. 15 levels - a vertical distance of 500 feet, and there is no reason to expect that it should not continue below No. 15 level, while it is probable that it is found above No. 9 level. The most southwesterly points where it has been cut are in the main crosscut at Nos. 15 and 14 levels. The most north easterly point is that at the face of the northern drive at No. 13 level. The distance between the points is approximately 460 feet so that there is reason to expect a length of at least this dimension. The greatest length driven on it so far is about 200 feet at No. 13 level. The width of the lode ranges up to 10 feet but is usually 3 to 5 feet. It consists of veins and patches

of galena throughout the formation, and will provide "seconds" with in some places "firsts". The higher silver content of the galena will increase the value of the "seconds" from the lode and has been found already will improve the silver content of the concentrates produced from the Mine.

WATER SUPPLY AND POWER

The Magnet Mine is, as far as possible worked by the hydro-electric power, derived from the water conserved in the Company's dams. For 9 or 10 months of the year, there is a sufficient supply of water to generate enough power for all purposes. During dry weather, especially the summer season there is not sufficient water to provide power for all purposes. The hydro-electric power is devoted to pumping purposes and steam is used for all other purposes where possible such as winding etc. These periods however, always entail a more or less complete cessation of underground working, especially breaking of ore. This annual period of reduced activity in the production of ore is a disadvantage which should be overcome if possible. One solution lies in the provision of larger supplies of water in order to enable sufficient power to be developed to work the mine continuously.

Several possible dam sites have been revealed by the survey of the Arthur River between the No. 1 dam and the intake of the new race further downstream, carried out under the instructions of the General Manager Mr. R. Hales. The construction of one of the dams would provide sufficient water to enable the mine to be worked almost, if not entirely, continuously.

CONCLUSIONS

The above descriptions of the works carried out since 1922 show that they are of considerable extent, and have been largely devoted to developing the Main lode and also prospecting for any continuations of it outside the known orebody and for the New lode.

These works have maintained and even increased the reserves of ore in the Main lode by making them available for ready stoping. The extensive prospecting of the New lode has proved it to be, although comparable to the New lode, a decided acquisition to the mine, and one which will increase the resources thereof.

In conclusion, the writer desires to express his appreciation of the assistance of Mr. R.G. Hales, General Manager, and the staff in facilitating the examination of the workings, mine plans etc.

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Hobart
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