

GLADIATOR (LATE AUGUSTA) GOLD MINE.

MT. MARGARET GOLDFIELD.

(K. R. Miles, B.Sc. (Hons.).)

The Gladiator Gold Mine is situated some 4 miles due west of Laverton. The company at present operating this mine holds a mining reserve which includes G.M.Ls. 2212T, 2213T, 2128T and T.A. 85T, the workings of the late Augusta G.M.

The rocks in the vicinity consist of fresh fine-grained greenstone lavas (probably typical trachy-andesites), medium-coarse grained greenstone or epidiorite, and decomposed greenstone schists (probably sheared greenstones).

Running through the area in an approximately north-south line with a broad arc facing eastward, are four roughly parallel bands of highly ferruginous banded jaspilite, each dipping 60°-70° E. Of these bands, which range from 8 to 14 chains apart, the two western lines are most continuous, and are traceable over a total length of about 90 chains. The two eastern bands, consisting of greatly folded, broken and irregular lenses, cannot be followed for much further than half a mile. About 45 chains to the south-west of the main shaft is a bold ridge, 14 chains long, of highly contorted jaspilite, enclosed by G.M.L. 1868T, late "Monarch." This ridge is running in a north-easterly direction about 35° to the line of the parallel bands, and is apparently the middle limb of a sharp dragfold which at its northern extremity pitches steeply N.E., and at its southern end steeply to the south.

To the north all the jaspilite bands disappear under a wide expanse of alluvial soil, while to the south the western-most line, after a break of about 70 chains, is traceable in an approximately continuous line for many miles south of the mine. The Gladiator G.M. is situated on the westernmost jaspilite line. This "line" appears to consist of two or more parallel bands varying in width from 10 to 100 feet and closely folded together in some places.

Broadly speaking, the rock on the western side of this line is of the fine-grained greenstone type while that on the eastern side is the coarser grained epidiorite.

Both the greenstone and the jaspilites have been intruded by later dykes of fine-grained quartz porphyry which has here and there been sheared to a "felsite." Gold-bearing quartz veins have been later introduced into all of the above rock types.

THE ORE BODIES.

There are two lodes, the Main Lode which had been worked prior to the mine being taken over by the present company, and the West Lode, which has been located since that date (1931) and was, at the time of inspection (June, 1938) in course of development.

The Main Lode.

This consists of a quartz reef varying in width from 6 inches to 5 feet, which occurs running longitudinally through an 80ft. wide band of jaspilite. The jaspilite has been intruded by quartz porphyry

which in the upper levels runs in a number of parallel bands or tongues following its strike and dip. In the lower levels the number of these tongues is reduced to two. In places this porphyry has been sheared to a soft felsite. The quartz, which has later intruded the jaspilite and porphyry is frequently to be found following the contact of these two rocks.

The jaspilite, at its contact with the quartz, is mineralised and here usually carries fair values.

Where the quartz lode forsakes the jaspilite contact and cuts through the felsite (or porphyry), as can be seen on following the lode down from the No. 3 (280ft.) level through the No. 4 to the No. 5 (450ft.) level, the values invariably drop. The quartz appears to have formed in tension cracks in the jaspilite and greenstone. In places the lode has a marked "herring-bone" structure, i.e., numerous roughly parallel vertical veinlets may be seen emerging on both sides of, and approximately at right angles to, the central "back bone" of the quartz reef.

Stoping has been carried out extensively in the upper levels, down to about 350 feet. At the time of inspection the Main Lode had been opened up over a payable length of about 450 feet on the No. 5 (450ft.) level and the main shaft was being sunk in preparation for development on the No. 6 (600ft.) level.

Surface boring has located a further extension of the Main Lode at approximately 750ft. V.D. A longitudinal section showing the stoping at present completed suggests a northerly pitch for the values, but the writer has been assured that only the richest parts of the lode have previously been worked and that moderate values for the most part extend throughout the length of the lode. There are, however, reported to be two richer shoots of ore on the No. 3 level, one at approximately 50 feet south of the main shaft which pitches steeply to the south and another about 80 feet north of the main shaft pitching steeply to the north.

The West Lode.

This lode consists of quartz in bleached and mineralised fine-grained greenstone. It is situated on the western or footwall side of the Main Lode. The quartz reef is very irregular in width and varies from thin stringers up to lenses 3-4 feet wide. Slight bleaching and mineralisation of the greenstone extends over a width of 12 to 15 feet.

The lode runs in the direction of N. 17° E. making an angle of 35°-40° with the Main Lode. It was first found on the No. 3 (280ft.) level where it was opened up for a distance of about 320 feet south of the main shaft. The lode dips very steeply to the east (80°-85°), steepening to almost vertical at the south end of the mine. On the No. 5 level it has been opened up for a length of about 480 feet and the quartz here appears rather more regular. At the time of inspection the northern end of this level (at about 200 feet north of the main shaft) ceased in quartz porphyry, a dyke which here cuts the lode, and runs approximately east and west. It appears probable that by piercing the porphyry dyke, a northern continuation of the lode should be located. No free gold was to be seen in the quartz of this lode which will probably prove to be rather spasmodic and low in value.

PRODUCTION AND GENERAL REMARKS.

A previous investigation of this mine, then the Augusta, G.M.L. 371, was made in 1905 by C. G. Gibson (Bull. No. 24, pp. 21-22). Prior to that time the lease was the property of the Golden Rhine G.M. Co. It had been worked by them from 1897-1903, during which time Mines Department records show that 15,497.5 tons of ore were treated for an average yield of 14.2 dwts. per ton. From 1905 to 1911 production was continuous, 12,969 tons yielding an average of 21.1 dwts. per ton. No production is recorded from 1911 to 1913, but from 1913 to 1915, and from 1916 to 1920, figures show that 4,883.51 tons of ore were crushed for a total of 1,655.55 ozs. of gold including 21.61 ozs. of specimen gold. The average yield for this period is thus 6.6 dwts. per ton. The average grade of ore produced since 1897 is then 13.96 dwts. per ton, but this includes a number of very rich patches found in the upper levels only.

The present company put through several trial crushings at the State Battery, Laverton, early in 1938, the details of which according to official returns are as follow:—

	Ore treated. tons.	Gold therefrom. fine ozs.	Grade dwts. per ton.
February, 1938 ...	109.25	11.15	...
March, 1938 ...	122.50	25.72	...
March, 1938 ...	205.25	60.83	...
	<u>437.00</u>	<u>97.70</u>	<u>4.46</u>

Minerals in the ore associated with the gold, which is usually in a very fine state, are quartz, pyrite, pyrrhotite, with small quantities of calcite in the bleached lodes. Graphite frequently occurs on the contact walls of the jaspilite; and the greenstone, where it lies in contact with jaspilite, frequently shows a narrow chloritic schistose zone.

Water level is at approximately 180-200 feet V.D.

Since the writer's inspection in June 1938 the company has completed the erection of a 10-head battery and cyanidation plant, and has now commenced production (December, 1938).

RECOMMENDATIONS AND CONCLUSIONS.

It appears certain that the management will have to depend almost entirely upon the Main Lode for its payable ore—at least in the earlier stages of production. The grade of ore in the West Lode, probably will prove, on the average, to be very low and the values irregular in occurrence. No obvious structural control for the presence of the ore bodies has been noted. The jaspilite band which lies immediately east of the Gladiator line and which parallels it so closely, could well bear further investigation, by drilling, for the presence of further parallel lodes. The fact that prospecting at various times has shown traces of gold there rather supports this suggestion. There appears to be no obvious geological reason for suggesting that the Main Lode channel may not prove to extend further, both south and north of the points to which it has so far been developed.

THE MARY MAC GOLD MINE, G.M.L. 2261T, LAVERTON.

K. R. Miles, B.Sc. (Hons.).

The following notes are the result of a brief inspection of the Mary Mac G.M. made in September, 1938:—

The Mary Mac G.M.L. 2261T, is situated on a strong ridge of highly dragfolded and very ferruginous banded jaspilite which runs in a direction slightly west of south from Laverton. The lease is about 110 chains south of the town, its northern boundary passing about 2 chains south of Enniskillen Trig., J.H.R. 16. The country on both sides of the jaspilite ridge is a sheared and decomposed greenstone.

The main shaft underlays at about 60° E. which is the dip of the jaspilite at this point. There are two levels—the upper (No. 1) at about 150' on the underlay and the lower (No. 2) at about 200' (underlay depth).

The lode material consists of mineralised jaspilite and stringers of quartz and, in places, thin wedges of sheared greenstone enclosed in the highly folded jaspilite. The dragfolds have a vertical or steep northerly pitch for the most part. The values follow no defined lode channel or wall, and workings so far appear to have been confined to the oxidised zone above the water table.

The lower level consists of a winding drive extending for about 200 feet north of the main shaft. The upper level extends for approximately 400 feet north of the main shaft, following the jaspilite through-out, and about 600 feet south of the main shaft to the water shaft. A crosscut just south of the main shaft cuts through the jaspilite-greenstone contact and runs westward for about one hundred feet in greenstone.

Preparations have been made to break out ore of good value on the No. 1 level at approximately 300 feet south of the main shaft. Here the lode material consists of jaspilite and decomposed greenstone schist, folded into a number of broad noses which pitch away steeply in a direction slightly south of east. Values up to 15 dwts. per ton are reported here.

A considerable amount of stoping has been carried out both north and south of the main shaft, above the No. 1 level. The water table is at about 180' V.D.

According to Mines Department records production at this mine was continuous from 1909 to 1913 during which period 4,756.5 tons of ore yielded 2,566.17 ozs. of gold at an average grade of 10.8 dwts. per ton. Since 1913 there is no record of any further mining activity here.

From 1934 to April, 1938, however, retreatment of tailings on this lease has produced 1,678.26 ozs. of gold.

At the time of inspection (September, 1938), preparations were being made for the erection of a small mill and treatment plant, and a gas producer was then being installed.

No large bodies of quartz nor any extent of small veins were noticed. Apparently the mine has not been opened up to any extent below water level, but the spasmodic distribution of values, in crumbly jaspilite, and the lack of definition of apparent lode channel,