

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.	Gold therefrom.	Grade dwts. per ton.
	tons.	fine ozs.	
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.

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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,

rather suggests that there has been considerable surface secondary enrichment and a sharp drop in values may be expected where the lode enters the zone of sulphides below the water table.

NOTES ON THE GEOLOGICAL STRUCTURE OF PORTION OF THE MT. MARGARET GOLDFIELD.

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

An examination of air-photos of different portions of the Mt. Margaret Goldfield furnished evidence for the conclusion that the Laverton-Morgans district would prove an area of which an interpretation of the geological structure could readily be obtained. This idea has been fully borne out after a field season of areal and detailed geological mapping.

A description of the general geology of the area under consideration will be found elsewhere (page 15). In brief it appears to consist essentially of a thick series of basic lava flows, tuffs and agglomerates, and (probably intrusive) coarse-grained greenstones, interbedded in which are a number of horizons of thin, acid-sedimentary rocks. This series of basic, predominantly igneous, rocks and thin sedimentary bands, has been tentatively called the Greenstone Complex. It has been intruded and replaced in a number of localities by masses of granite and/or gneiss. In areas reasonably suspected of overlying this rock type, outcrops are generally poor and structural information is almost completely lacking.

THE BROAD GEOLOGICAL STRUCTURE.

As was found in the re-survey of the South Yilgarn Goldfield in 1935-36, the key to the elucidation of the major geological structure—and also some of the minor folding—was provided by a study of the distribution of the thin sedimentary layers in the Greenstone Complex. These are represented by banded ferruginous quartzites, or jaspilites, and blue-grey graphitic slate, described elsewhere (page 16).

An illustration of the structure of that portion of the Mt. Margaret Goldfield which has been mapped up to the end of the 1938 field season (December, 1938) is provided in Plate VIII. This structure-contour plan represents the outlines of three distinct sedimentary horizons, which on the eastern (Laverton) side of the area, are represented by jaspilite beds. The Mt. Crawford-Laverton line marks a fairly continuous jaspilite zone, and the Lancefield-Euro line is traceable as a discontinuous line of outcrops of jaspilite running from a little north of Lancefield to the north shore of Lake Carey. The Gladiator-Mt. Jumbo horizon of jaspilite runs in an almost continuous series of outcrops from Gladiator down through Mt. Margaret and Morgans, and up to Waihi.

The Windarra-Ajax horizon consists of a fairly continuous jaspilite line running southerly from Windarra to about 5½ miles south of Mt. Ajax, where it swings westward. Its north-westerly continuation is represented by a few broken outcrops only. North of a point 10 miles due east of Mt. Korong, all trace of this horizon is lost in a wide expanse of granite and/or gneiss.

The contour line immediately west of Morgans-Waihi represents the outcrop of a fairly continuous band of graphitic slate and jaspilite which probably constitutes the same sedimentary horizon as the Lancefield-Euro and the Mt. Crawford-Laverton beds. The same horizon is also probably represented by a short line of graphitic slate which runs in a direction slightly east of north through Murrin Murrin.

West of Murrin Murrin the structure line which passes through Mt. Flora indicates the approximate position of a broken line of jaspilite outcrops, which have not yet been mapped in detail. North of Mt. Flora, and both north and west of Waihi, are extensive areas of granite and/or gneiss.

The rocks of the Greenstone Complex have undergone primarily two sets of folding, the axes of which lie approximately at right angles to each other. This folding is reflected in the distribution of the rock types in the area.

In the first system the axes of folding trend north-north-west and south-south-east, swinging further west in the northern portion of the area so far mapped, and they represent a series of parallel anticlines and synclines. As indicated by a constant fairly steep regional dip to the east throughout the area, these folds are almost uniformly overturned towards the west. Two of the major folds in this system form a more or less isoclinal anticlinorium and synclinorium on the eastern side, while there is a third broadly asymmetric synclinorium or major synclinal fold on the western side. This axis of the major anticlinal structure, swings from S.W. to S.S.W. from a point 9 miles west of Mt. Windarra to 5 miles east of Mt. Margaret, and thence probably continues southwards down the centre of Lake Carey. The axis of the eastern major syncline passes southwards between Mt. Crawford and Lancefield and through Laverton along a line which runs through a point approximately 3 miles east of Childe Harold. The axis of the western major syncline probably runs from a little east of Monument Hill to a point approximately 3 miles east of Yundamindera.

The second system of folding which is superimposed upon the first, consists of a series of cross-folds whose axes run approximately E.N.E.-W.S.W., and which have produced changes in strike in the rocks of the Greenstone Complex, resulting in the broad curving, and the convergence and divergence of the lines of the jaspilite outcrops as illustrated by the structural lines in Plate VIII.

The most striking feature of this structure-contour plan lies in the two central concentric structure lines which form a wide belt sharply curved to form a rather flattened double parabola, with convexity facing southwards in the vicinity of Mt. Margaret, where it shows a steep southerly dip. The regional southerly dip at Mt. Margaret thus becomes the pitch of the major anticlinal structure. This structural pattern represents portion of that which is produced by the imposition of a broad east-west synclinal crossfold upon a major anticline whose axis lies approximately north and south, and is overturned steeply to the west.

The complete structure would show a second flattened parabolic curve with convexity and dip to the north in such a position as to be diametrically opposite the first, at some distance south of Mt. Margaret.