

in quartz showing small flakes of biotite mica dollied from the reef on Butcher and Sheen's P.A. No. 787U to the north.

The several reefs so far opened up show that the high values obtained at the surface do not continue below 50 feet, that the shoots are short and of irregular value, and that the thickness of the reefs is extremely variable, both along the strike and down the dip. The deposition of gold in cellular portions of the quartz, as well as in joint planes in decomposed wall rock, indicates the influence of local enrichment due to solution and deposition of primary gold. Prospecting work done to date (November, 1937) shows that the country rock is liberally intersected with pegmatite and granite dykes and that the reefs are faulted.

The area is one admirably suited for the prospector, but the work recently done by the Riverina Gold Mining Company, who held sampling options on the areas, has shown that there is not sufficient thickness of quartz nor continuity of values at even shallow depths to meet the requirements of a mining company.

The flat soil-covered country south of Monkeom's P.A. No. 793U at the northern end of the locality, and east and north of Morley's P.A. No. 781U at the south end, through which a drainage channel runs in a south-easterly direction, is likely to contain alluvial gold, and offers excellent chances of giving payable results from a series of closely spaced hand bores sunk to bed rock.

KING OF CREATION GOLD MINE, MT. MARGARET GOLDFIELD.

(By R. A. Hobson, B.Sc. (Hons.).)

The King of Creation Gold Mine is situated approximately 36 miles north of Laverton, and two miles east of the Erlistoun Road. The operating company holds a mining reserve and four leases (2289T, 2141T, 2327T, 2224T). At the time of inspection (November, 1937) work was confined to lease number 2141T.

The rocks in the vicinity are mainly metamorphosed sediments, consisting of phyllites, graphitic schists and quartzites, with lenses of massive greenstone. The broad distribution of these rocks has not been mapped, but they are known to extend several miles eastward of the workings, and a lesser distance westward. In the workings they have a general north strike, and dip westward at steep angles.

Access to the main workings is by a vertical shaft, approximately 130 feet deep. North from the main shaft the Water Shaft and the North Shaft give access to smaller workings, which are not connected with each other.

DESCRIPTION OF ORE BODIES.

Main Workings.—The main workings consist of an open cut and two levels—at 96 feet and 145 feet respectively. The 96ft. level consists of three approximately parallel drives, having an *en echelon* arrangement and connected by crosscuts. Going south the drives are stepped west, and will be referred to as the East Parallel Drive (this drive is north of the Main Shaft), the Drive off Main Shaft, and the Main South Drive respectively. From about

the centre of the Main South Drive a winze gives access to the 145ft. level, at which level approximately 160 feet of driving has been done.

At the surface the open cut has a length of 270 feet, a maximum width of 40 feet, and an average width of 25 to 30 feet. The open cut extends to the 96ft. level, and has been the main source of ore crushed. At the 96ft. level the ore body has a stope length of 290 feet, and a maximum width of 40 feet. The ore body is of the lode type, and consists of quartzite, with minor quantities of phyllite, and varying quantities, frequently large, of vein quartz. Its strike and dip are parallel to that of the enclosing country, i.e., strike is north and dip west at steep angles. Best values are reported to be in vughy quartz or in open textured quartzite. At the south end of the open cut the lode formation is seen to continue at the surface for 150 feet, but values are reported to be unpayable.

Normal water level is at 100 feet, and therefore all ore from the open cut has come from within the zone of oxidation.

The lode formation at the 145ft. level is quite defined, but values are reported to be very erratic. Although this level is 45 feet below normal water level the rocks are still very weathered, and the zone of primary ore has not yet been reached. No work was in progress at this level at the time of inspection.

A structural control is not apparent from an examination of the present workings, but the general *en echelon* arrangement of the ore bodies suggests control by folding. There is nothing to suggest that the lode formation will not continue downwards, but the possibility of lower values being obtained in the primary ore due to the absence of secondary gold should be borne in mind.

Above the South Drive off the Main Shaft the ore body has a stope length of 100 feet, a maximum width of 10 feet, and an average width of approximately 8 feet. A continuation of this ore body north of the shaft consists of stringers of quartz in phyllite. No work was being done in this ore body at the time of inspection. In a winze and a crosscut, which intersected this lode formation 45 feet below the 96ft. level, values were found to be unpayable.

In the East Parallel Drive a large body of quartz has been driven on for 90 feet, but, except where originally intersected in the crosscut from the North Drive off Main Shaft, has been found to contain no values.

Water Shaft Workings.—The Water Shaft is 122 feet deep, and there are two levels at 60 and 100 feet respectively. Numerous small bodies of quartz have been intersected, but none have been stoped. A small quantity of ore has been obtained from an open cut, which is 70 feet long and has an average width of 6 to 7 feet.

North Shaft Workings.—The north shaft is 100 feet deep, and there are three levels at 40, 60 and 100 feet respectively. A quartz reef, striking and dipping parallel to the country, and having at the surface a length of 230 feet and an average width of approximately 8 feet, has been worked by an open cut to the 40ft. level, and stoped from the 100ft. level. The maximum stope length is 80 feet at the 100ft. level. Stoping is confined to the footwall portion of the reef, and there are also large quantities of quartz

in the drive south of the stope. Payable values were evidently confined to portions of the reef. No work was being done on this reef at the time of inspection.

PRODUCTION.

For the periods 1904-1913 and 1926-1937 Mines Department records show that 20,475 tons of ore have been crushed for a total of 4,464.84 ounces of gold, including only 11.66 ounces of specimen gold. From 1913-1926 no production is recorded. The average grade of the ore produced is therefore 4.4 dwts. An inspection of the yearly returns indicates that, except for 1904, the yearly average grade has not exceeded 9.4 dwts. gold per ton. The ore bodies are therefore to be regarded as of low grade.

CONCLUSIONS.

At the time of inspection work was confined to one ore body, from which the greater part of the ore crushed has been obtained. The average grade of the ore produced has been low. The present examination has not revealed any geological difficulties, and no reason is apparent why the lode formation should not continue downwards. The presence of the best values in vughy quartz or open textured quartzite is suggestive of secondary enrichment. No free gold, visible to the naked eye, is reported to be present in the ore body. All the ore so far produced has come from the zone of oxidation, and although the workings extend below normal water level the zone of primary ore has not yet been reached. Any general increase in values immediately above the zone of primary ore should be regarded as evidence of secondary enrichment, and values in the primary ore should be expected to drop away.

There appear to be no geological difficulties to complicate the testing of lodes immediately below the present workings.

REPORT ON THE CLACKLINE FIREBRICK CLAY PITS (SOUTH-WEST DIVISION).

(By R. S. Matheson, B.Sc.)

The brickyards embrace portions of Locations 18, 19, 171 and 172 (Lands Dept. Litho. 2A/40), and are situated on the north side of the Great Eastern Railway approximately one mile west of the Clackline Station.

GENERAL GEOLOGY.

The rocks of the area bear a striking resemblance to those of the Yilgarn System,* and consist of interbedded greenstones and erosion sediments which have undergone a high grade metamorphism. The main rock types are schistose greenstones, mica schists, sillimanite schists and garnet schists, and they have been intruded by granite and epidiorite dykes. The general strike is N.N.W. and the dip 70° W.S.W. The country has been highly folded and sheared, but too small an area was mapped to arrive at any reliable structural interpretation. Some evidence suggesting the existence of minor structure can be seen in the workings, but it could not be interpreted.

* G.S.W.A. Bulletin No. 97 in preparation.

Weathering has been the main process in the formation of the clays. The quality of the clay depends on the extent of weathering and the nature of the parent rock, and variations in quality are bound to occur vertically and along the strike of any rock band.

The following materials are used by the management in the production of the firebricks.

1. *Kaolinised Schistose Greenstone* (No. 1 Clay).—This material is puggy and white, and has a banded appearance due to the presence of black streaks. A gradation from this material, through biotite schist to only partly weathered greenstone schist, was observed. This alteration is identical with that seen by the writer in the underground workings of Marvel Loch Gold Development, N.L.** The kaolinised schistose greenstone is the predominant type of clay and its occurrence can be seen on the accompanying map (Plate I.).

2. *Kaolinised Dolerite* (No. 3 Clay).—This material is blocky, cream coloured, and contains scattered black specks, but there is no suggestion of banding. The clay is believed to be a weathering product of a dolerite dyke, because of its similarity to the decomposition products associated with the dolerite dyke outcropping in the creek, east-south-east of the north pit.

3. *Sillimanite Schist*. (No. 4 Clay).—The material is white to straw coloured, and sillimanite can be seen in the hand specimen. The sillimanite is a metamorphic mineral, and variations in the percentage of sillimanite in the rock are bound to occur.

4. *Kaolinised Mica Schist*.—The only occurrence of this material is in the crosscut off the east side of the north pit, and a gradation from white kaolin to hard mica schist was observed.

Mica schist is used in the manufacture of some bricks and at present is obtained from a point about one mile north of the brickyards. A band of mica schist occurs in the north pit and should be tested for its suitability in brick making as it is more conveniently located for cheap mining.

5. *Pegmatite*.—Decomposed pegmatite veins and stringers occur abundantly throughout the workings, and the material is being used as a "filler."

NORTH PIT.

The pegs, which were placed as guides for stripping the overburden from the useful clay bands, are shown on the map, but a little explanation is necessary.

The kaolinised schistose greenstone band is divided by a fissure along the north drive, into two qualities of clay, and the position of the fissure at the surface has been pegged. The higher quality kaolin lies to the east of the fissure, and the quality decreases as the biotite schist, in the face of the west crosscut, is approached.

The kaolinised mica schist band in the crosscut from the east side of the pit is 18 feet wide, but apparently lenses out before the east crosscut from the north drive is reached.

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