

The prospects of this mine down to the 500ft. level as revealed by the nature of the ore shoots at the 400ft. level and the winzes down to 500 feet are shown to be very good in the present state of the workings, and there is no obvious geological reason why payable values should not be expected below the 500ft. level.

As a future underground prospecting campaign, parallel ore bodies which may not have outcropped could be sought for in the country rock by means of a diamond drill. A study of the manner of occurrence of the shoots already worked would have to play a large part in the location of these bore sites.

#### MORLEY'S FIND (SIX MILES NORTH OF RIVERINA AND 30 MILES WEST OF MENZIES, NORTH COOLGARDIE GOLD-FIELD).

(H. A. ELLIS, B.Sc., A.O.S.M., Geologist.)

Rich patches of gold bearing quartz have recently been found in this locality in a belt of folded sediments and greenstones of sedimentary origin underlying a soil-covered flat immediately east of a ridge of fresh amphibolite schist, which probably represents schistose basaltic or doleritic lavas. The regional strike of the schistosity is north and south, and the dip steep to the east. Steep opposed dips are frequent in the schistose amphibolites to the west indicating tight folding.

Extensive outcrops of fine grained biotite granite occur half a mile north-west of the main mining localities, and numerous smaller granite masses, pegmatite dykes, aplite dykes and barren quartz reefs traverse both the fresh looking greenstone and the weathered sediments in which the reefs occur.

The quartz reefs so far found to be gold bearing lie parallel to the planes of schistosity of the country rock, and are much faulted with pegmatite and aplite dykes frequently occupying the fault planes. In most cases the relation of the pegmatite dykes to the quartz reefs is clear, the dykes being younger than the gold bearing reefs, but in one instance, on Morley's P.A. No. 781U at the south end of the area, the relation of a particularly rich concentration of auriferous quartz to a pegmatite dyke in transverse contact with it is not so clear. Unfortunately, mining operations have destroyed much of the evidence which would have revealed the interrelation of these two bodies.

With the exception of the gold occurrences in Monkcom's P.A. No. 793U, and Morley's P.A. No. 781U at the north and south ends of the area respectively, the auriferous bodies are of the lenticular quartz reef variety occurring in shear planes on or near the axial plane of a tight fold varying in width from five feet to a few inches, with rich short shoots of gold bearing quartz showing the influence of secondary enrichment. The deepest workings seen were 50 feet, and in each case the high surface values had terminated at or before this depth. The pitch of the shoots at the north end of the area is at about 45 degrees to the south and coincides with the pitch of the quartz filled dragfold being worked on Monkcom's P.A. No. 793U.

In the workings on this latter P.A. the surface workings are in the tightly folded synclinal portion of a dragfold, and in a shaft 40 feet deep sunk 40

feet south of the open cut, an anticlinal crest of a quartz filled fold appears in the bottom of the shaft pitching south at about 45 degrees. The nature of this occurrence has been explained to the prospector and the best method of mining it by an inclined winze demonstrated to him. The possible recurrence of similar pitching quartz bodies below and above the one already being worked, taking into consideration the direction of the regional dip of the strata, was also stressed.

The two short, nearly horizontal shoots of quartz which gave sensational values in shallow workings just below the ground surface on Morley's P.A. No. 781U (to be converted to a Reward G.M.L.) were found on close examination to be occurring in the westerly dipping portion of a gentle dragfold, the upper limb of which has been eroded. In the more southerly of the two workings from which the specimen stone was taken, the western wall rocks, though highly weathered, disclosed one perfectly preserved dragfold, the axis of which was horizontal, and whose axial plane dipped steeply to the east, showing that the westerly dipping limb in which the auriferous quartz occurred unquestionably formed part of a gentle dragfold in an incompetent bed in a series of steep easterly dipping strata.

There were probably similar concentrations of auriferous quartz above those now worked out where the dip changed from west to east in the strata which have been eroded. The structure has almost certainly been repeated in the upward continuation of this fold, and if auriferous quartz had been deposited in it as seems most likely, then the gold has gone to form alluvial deposits to the east.

The more northerly of the shallow workings in which the rich stone was found appears to have a gentle southerly pitch, while the pitch of the more southerly workings appears to be horizontal. A slight change of pitch is indicated here. The westerly dipping bed has recently been found between the two worked out shoots, and although the wall rock is exactly similar, there is no gold-bearing stone in this central hole.

The concentration of values seems to be confined to the westerly dipping limb, and possible recurrences of gold ore may be found by prospecting along the strike north and south of the present workings or by sinking a winze in the easterly dipping beds below the worked out deposits in the hope that the dip will again change to the west with a deposition of quartz at or near the bends.

The pegmatite dyke seen at the south end of the south patch cutting across the shoot, and from which point the shoot extends in a northerly direction, may or may not have been responsible for the introduction of the auriferous quartz in the immediate vicinity. Insufficient evidence is as yet available from the present workings to determine this point. There is a considerable development of pegmatite and granite dykes in the vicinity, and none of the workings, either in the shaft sunk to cut a quartz reef north of the rich patches or in an open cut and trenches on the same reef, reveal the true manner of occurrence of the dykes.

The conception that the auriferous quartz is derived from a granite magma is considerably strengthened by the presence of good gold values

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