

is a definite Dandaragan Ridge as suggested by Campbell and Blatchford, but which was not observed by the writer, it can best be explained by a normal erosion scarp in the soft Cretaceous beds which certainly do not extend eastwards to Moora.

The Dandaragan Scarp is considered to be a normal erosion scarp. Mt. Misery and Yandan Hill, both lying to the west of the Scarp, are suggestive of erosional outliers from the main mass, while the beds of which the upper part of Mt. Misery is made up are similar in all respects to the lower beds exposed in the main scarp. If there were a fault between the two with a downthrow to the west, one would expect to find Mt. Misery composed of Cretaceous or even younger rocks. There is nothing in the area to suggest this. In a report published by the writer in 1931* he suggested that the Poison Hill-Quinn's Pole Scarp, west of Gingin, which appears to be continuous with the Dandaragan Scarp was due to faulting, the evidence being the alignment with the main Darling Fault Scarp further south and the presence of a number of mound springs with a north and south alignment (roughly parallel with the scarp) on the sand plain to the west. The fact that the writer has since found that these springs do extend much further south, well out from the Darling Fault Scarp and apparently unconnected with faulting, and also the strong evidence obtained at Dandaragan lead him to alter his earlier views and to believe that the Dandaragan and the Poison Hill-Quinn's Pole Scarp are nothing more than normal features of erosion.

A striking feature in the sand plain and one which suggests reflected sub-surface structural conditions is seen in a mass of hills including Walyering Peak, about six miles west of Mt. Misery.

Viewed from some distance to the south the main hill is seen to be double-topped, Walyering Peak being the more westerly of the two, the other lying about 1¼ miles east being unnamed. There is a broad saddle between the two and the higher ground on both peaks is capped with duricrust. The striking feature of the peaks is that their outer slopes are gentle, conforming to the contour of the main hill while the slopes facing each other are steep and, although low, are of scarp-like appearance. The obvious easterly dip at Mt. Misery on the east and the appearance of dip slope topography in the two peaks themselves and in subsidiary hills on the western side of Walyering Peak suggests that the hills as a whole are a topographic reflection of a buried anticlinal structure. The features described above are illustrated in the accompanying sketch. From the top of Walyering Peak there is a similar suggestion of dip slopes to the south but to the north the hills run in irregular rolls as far as can be seen and further search to the north was not considered important until the suggestion of structure at the southern end was proved.

Owing to the complete mantling of the underlying rocks by loose sand and duricrust it was not possible on a reconnaissance to prove or disprove the presence of anticlinal conditions. It was noticed, however, that whereas most of the duricrust was of a coarse gritty nature and therefore formed in a sandstone or grit, there were fragments lying around the sides of the hills with a fine-grained laminated structure probably derived from a shale. It should, therefore,

*"Inspection of Gingin District for the Department of Agriculture," by F. G. Forman. G.S.W.A. Ann. Prog. Rep. for 1930, p. 8.

be possible by detailed survey with proper instruments to work out the structure of the underlying rocks.

PETROLEUM PROSPECTS.

It can be said immediately that the area of igneous and metamorphic rocks of the interior tableland to the east of Moora is hopeless as regards petroleum prospects.

The presence of a supposed seepage of mineral oil in the coastal sandhills could not be confirmed owing to the failure of the original discoverer, Mr. Booter, to locate the occurrence. However, from his description and from my own observations of the locality it is highly improbable that an oil seepage exists.

The presence of a structure suitable for the retention of petroleum in commercial quantities in the vicinity of Walyering Peak can only be proved by detailed structural survey, assisted possibly by the sinking of shallow test pits or bore holes, by which to identify key horizons. Topographic suggestion of structure in this locality is certainly promising and justifies further work to supplement the at present meagre evidence.

As there are no naturally exposed sections in the area examined, very little of a definite nature can be said of the sub-surface formations. A study of the core from the Moora Bore leads one to expect that the sand plain country is underlain by strata of Jurassic age, which being predominantly argillaceous would serve well as cover rocks for the retention of petroleum.

The Jurassic strata are presumably underlain by rocks of Permo-Carboniferous age, by analogy with the Irwin River area further north where these two series are well exposed for study. Whether any of the Jurassic or Permo-Carboniferous strata are likely in the past to have been possible source rocks for petroleum the writer is unable to state, owing to insufficient personal knowledge of the areas in which these rocks outcrop.

Both the Jurassic and Permo-Carboniferous series where exposed to the north include porous beds suitable as reservoir rocks for the retention of oil, and there is little doubt that they should extend south under the area examined.

RECOMMENDATIONS.

If further work on the Dandaragan area is undertaken it must include not only the proving of the structure near Walyering Peak or the discovery of a suitable structure elsewhere, but a detailed examination of the large area of country to the north, where the rocks underlying the Dandaragan area presumably outcrop, with the object of deciding whether possible source rocks for the generation of petroleum are likely to exist.

Not until good structural conditions are found and the strata proved likely to be petroliferous, is further development of the area in any way justified.

PALMER'S FIND—YELLOWDINE, W.A. (F. G. FORMAN, B.Sc.)

LOCATION.

Palmer's Find is situated on a low rise on the western side of a salt lake about 8¾ miles S.S.E. of Yellowdine Siding on the Eastern Goldfields Railway, and about two miles east of the 8-mile peg on the road running south from Yellowdine to Parker's Range.

GEOLOGY.

The country rock in the vicinity of the find is a hornblende quartz schist, which is part of a long narrow band of basic rocks which extends southwards from the railway just east of Yellowdine.

The eastern boundary of the schists is hidden by the mud covered floor of the salt lake, but rocky headlands projecting into the lake east of the find indicate that the schists extend in this direction for at least a quarter of a mile.

To the west of the find, the rocks are hidden by a continuous soil covering, but the dark red loamy nature of the soil for some distance to the west, indicates that the schists extend in this direction, but for what distance is uncertain, as time did not permit of a search for the western boundary being made.

The light coloured sandy nature of the soil along the Parker's Range road between Yellowdine and the turn off to Palmer's Find, suggests in the vicinity, the presence of granite or some other rock of acid type.

The gold occurs in steeply inclined quartz reefs associated with pegmatite veins and small masses of granite, all of which are intrusive into the basic schists. The reefs strike north and south, but their dips are uncertain owing to the shattered condition of all the rocks near the surface, and the fact that the walls of the reefs have not been, at the present stage of development, anywhere definitely exposed.

THE REEFS.

At the time of my visit three quartz reefs were being developed, known as Whindfield's East, Whindfield's West and Egan's reefs. A fourth large composite reef of quartz and pegmatite forms the backbone of a low hill to the west of Whindfield's West reef. I was informed by Mr. Whindfield, senr., that low values occur in this reef.

WHINDFIELD'S EAST REEF.

This reef lies along the Western boundary of P.A. 3213 and is exposed in costeans over a length of about 300 feet, with a width of from 5 to 21 feet. At the Northern end of P.A. 3213 an open cut has exposed the reef for a length of 70 feet and a width of 16 feet, and high grade ore is being taken out.

Pan samples from various parts of the reef show good values, over 1 ounce to the ton. Assay results shown to me by the option holders, indicate that high values obtain over the full length of 300 feet at present exposed.

WHINDFIELD'S WEST REEF.

This reef on P.A. 3195 lies parallel to and about 60 feet west of Whindfield's East reef. It has been exposed in costeans showing high values for a length of 300 feet and has been developed by an open cut at its northern end for a length of about 60 feet. At the northern end of the cut the reef appears to be about six feet wide and makes a sharp bend to the east, towards Whindfield's East reef.

EGAN'S REEF.

This reef lies north of the other two on P.A. 3205. It outcrops for several hundred feet in length. It has been opened up at its southern end by an open cut over a width of nine feet, the stone to the bottom

of the cut, 20 feet, all showing high values. Assay results shown to me by the option holders, indicate that the high values extend north of the open cut for a length of about 100 feet, north of which values are low.

The quartz in Egan's reef is characterised by a large amount of arsenopyrite which is spread throughout the stone. The quartz is pegmatitic in character, containing scattered crystals of felspar, while in places the quartz gradually merges into a typical pegmatite, though still carrying gold.

Granite and pegmatite are exposed on the surface on the eastern side of the reef from the open cut to a distance of about 100 feet to the north, and granite can be traced southwards to where it outcrops to the west of Whindfield's West reef. The impression I obtained was that Egan's reef is separated from the two southerly reefs by a continuous granite bar, but sufficient work has not yet been done to enable the true relationship of the three reefs to be stated with certainty.

CONCLUSION.

The even distribution of high values over a total length in the three reefs of 700 feet and the good width of the reefs make the find a most encouraging one, but the full extent of the discovery cannot be gauged until further work has been done.

Very few specimens were seen in which any free gold was visible, but all the stone tested gave uniformly high results when dollied, showing that the gold is evenly distributed through the body of the quartz, and is, therefore, not a product of secondary enrichment. The high values obtained at the surface can therefore be expected to continue with depth.

LODE MINING AT YINNIDING CREEK,
TOODYAY DISTRICT.

(F. G. Forman, B.Sc.)

At the time of Mr. Blatchford's last visit to the field, February, 1932, a considerable amount of prospecting had been done in shaft sinking, etc., but without success. The only appreciable amount of gold which had been obtained, apart from the alluvial in Yinniding Creek, were 20 ozs won from a narrow lens of quartz found by loaming up the side of the hill, but which was much broken and cut out completely.

Slater's Workings (G.M.Ls. 11PP, 12PP, and 15PP).

The principal new workings are on G.M.L. 15PP, where an adit has been driven into the hill in a southeasterly direction for a distance of about 200 feet. An auriferous lode was cut in the adit workings 140 feet from the mouth, and this has been opened up by a south-west drive for a length of about 130 feet. The country rock exposed in the adit is a fine-grained light-coloured mica schist of sedimentary origin showing distinct bedding planes dipping to the southeast at an angle of 20 degrees. The lode formation on which the drive has been opened is a band of quartzite interbedded with the mica schist, and containing numerous veins and veinlets of iron-stained auriferous quartz running parallel to the bedding. The quartzite is usually hard and vitreous, but there