

"At the Cosmo Newberry there is an area of country some ten miles long and three to five miles wide, consisting for the most part merely of a series of small lenticular gashes in the greenstones, and from their appearance are not likely to live continuously to any great depth; their gold contents, too, are mostly low. A good deal of surface prospecting has been done here, but no work of any importance; several potholes have been put down, and one shaft has been sunk to a depth of about 30 feet.

"There is a Government well at the Ranges, but the supply of water is small, due to the well not being deep enough.

"Mount Shenton is the highest point on a north and south range of hills formed by a large belt of hematite-bearing quartz reefs; this belt is in greenstones, and the whole extent of the probable auriferous country is only some 10 miles by 2 (including Mt. Venn, which is the southerly extension of the range). This hematite-bearing quartz belt is some three miles long, but as far as tested is practically non-auriferous. Near Mt. Venn the belt dies out, but there is a larger extent of greenstone country. These greenstones are mostly massive, and are intruded by masses of porphyry; a few quartz reefs occur, but they are mostly small and irregular and low in gold contents.

"At Mt. Warren are a series of rough greenstone ranges extending over an area of some six or eight square miles; these greenstones appear to be similar to those usually comprising the auriferous series of our goldfields, but as far as could be seen in a cursory examination (owing to scarcity of water) quartz reefs are conspicuous by their rarity.

"A full detailed account of these districts will be given in the report now in course of preparation."

New Find 60 miles E.N.E. of Duketon.—Mr. Gibson prepared the following preliminary report upon this district:—

"I have visited the new find, situated on the south-east side of Lake Wells, in the vicinity of the Ulrich Range, and about 60 miles east-north-east of Duketon, and have made an examination of it as to its extent and probable resources.

"The workings are situated on the north-eastern side of a low rough ridge of greenstone hills, trending in a general north-west and south-easterly direction for five or six miles, and having a maximum width of a little over a mile, tapering to nothing at either end; these hills are entirely surrounded by sand plains and spinifex. The rocks which comprise this ridge consist of fine to coarse-grained massive and foliated greenstones (amphibolite), similar to those usually found forming the auriferous series of the Eastern fields, and are traversed by a large number of acidic dykes, varying from a coarse-grained granite to a fine, compact, quartz porphyry, the latter type being by far the more prevalent. These dykes vary greatly in size, and run in all directions, though the majority of them have a general north and south trend; they also appear to be newer than the quartz reefs which they frequently cut through; the greenstones are usually considerably crushed and foliated in close proximity to them. The north-eastern fall of the hills is into a long narrow arm of salt lake—probably part of Lake Wells—lying from about two miles away.

"This lake runs past the north-western end of the hills, and then turns and runs southerly, being crossed by the road about six miles west of the 'find.'

"The present workings are situated on a small gully running down the eastern fall: this has been worked at irregular intervals for a length of about 20 chains, and a good deal of work has been done. Most of the gold has been got in the wash right in the bed of the creek at a depth of from two to four feet from the surface, and usually at points where the gully is crossed by the granitic dykes which form natural riffles on the bed of the gully. No, or very little, gold has been got on the fall of the hills into the creek; and this fact, viz.:—that all the gold has been shed and carried into the bed of the creek, militates against the chance of any rich leaders being found. So far most of the gold found is pretty fine, the largest piece obtained being less than 10dwts. No specimens have been obtained, but one or two pieces of gold were found with small pieces of ironstone attached, which would show that the gold has been shed from a small ironstone leader, or leaders, in the greenstones, which has been completely denuded away. There are several other gullies in the hills, and these have all been tried for alluvial, and so far with negative results; the sides of the hills and the flats at the foot of them have also been tried in numerous places with similar results. At the time of my visit there were seven men at the 'find,' one of whom was employed in carting water from the soak 20 miles distant by road, the remaining six were engaged in alluvial working, and had obtained amongst the lot of them between 15 and 18dwts. of gold as the results of a week's work. These men professed themselves as very dissatisfied with the district, and gave it as their intention to leave the place within the next few days. On my way into Duketon I passed another party of five on their way out to the 'find'; this will make quite a sufficient number of men to thoroughly test the locality, if that has not been done already.

"While at the 'find' I saw several runs put through the shakers, and all of them with very disappointing results, mostly only a couple of small 'colours.' A party of four who were at the 'find' some weeks before the present party obtained 8ozs. 7dwts. of gold as the result of six weeks' work; while, in addition to this, one man got from 28 to 30dwts., but I was unable to ascertain how long it took him to get this amount.

"This district was originally prospected by H. Swincer, who is said to have obtained a little alluvial gold here about four years ago; a couple of years later, Kirkpatrick and party, as the result of several weeks' work, obtained a few ounces of alluvial gold; I was unable to ascertain the exact amount, but it was said to be somewhere about 10ozs.

"As regards the reefing possibilities of the district, I don't think anything of importance is likely to be found in this line. Quartz reefs are certainly fairly numerous, but they are small and very irregular, being for the most part merely short lenses or gashes running with the foliation of the greenstones, and are, I think, not likely to live to any great depth; they are also much broken and distorted, owing to the

intrusions of granitic dykes; the quartz is white and glassy, and, as far as tested, very low in its gold contents; a large number of samples were 'dollied' by myself, and the best result obtained was only slightly better than a trace, most of them being blanks. There is, however, one fairly well-defined line of reef—or, rather, line of lenses—traceable on the surface in a north and south direction for a distance of about 10 chains, the largest continuous length of quartz being about 60 feet, and having a maximum width of about three feet; it is, however, broken in several places by granitic intrusions, and the lenses of stone are likely to behave just as irregularly vertically as they do longitudinally.

"The stone in this line is the typical white glassy quartz, and near the north end has a considerable quantity of carbonate of copper associated with it, as well as occasional small pockets of galena. This line was carefully sampled by myself, and a large number of samples dollied, the best prospect obtained being equal to about 1 to 2 dwts. per ton. A few of the samples gave traces of gold, but the majority of them were blanks.

"Almost every one of these reefs show signs of having been sampled several years back, and the area of possible auriferous country is so restricted that two or three men could thoroughly prospect it, from a reefing point of view, in a couple of weeks, and I am of opinion that this has already been done. The country rock is extremely hard right on the surface, and under existing conditions, *i.e.*, with the nearest battery 60 miles away, and over heavy sand at that, reefs would have to be exceptionally rich to be of any use to the prospectors, and I do not think there are any reefs of this description in the locality; and in my opinion, even if the reefs were of fair grade, there is nothing of sufficient size or regularity to warrant even the thought of erecting a battery on the spot.

"With regard to other possible finds in the vicinity, from personal observations, there is no auriferous country to the south until the Cosmo Newberry Ranges are reached: none south-easterly till Mt. Warren—and this is an exceedingly poor belt; and none westerly or south-easterly till the Duketon-Erlistoun belt. To the north and north-east, beyond Lake Wells, low granite ranges and sand plains extend as far as can be seen, and these are said to extend in this direction for practically an unlimited distance.

"As to the water supply of the locality, a well has been sunk on the eastern fall of the hills, about a mile and a-half from the lake, in which water was struck at about 30 feet. This water is, however, too salt to be of use even as stock water. If a well was put down on the other fall, I think the chances are that this would probably be salt too, as the lake runs round this side of the hills as well, though at a somewhat greater distance—about six miles. I do not think a permanent fresh water well is likely to be found in the locality. The present water supply is from a soak in a small creek eighteen direct miles from the 'find' along the Duketon road; water has to be carted from here to the 'find' over heavy sand, and the supply is only very limited and unless replenished by rain is not likely to last many more weeks. Between this and Duketon there is no water except at a rock hole six miles from the soak; this, however, is most probably dry by now as there were only a few gallons of water in it early in November.

"I don't think the 'find' is of sufficient promise to warrant the Government going to the expense of putting down wells along the road, but if these are put down, almost the only places where they could be put would be (1) on the cork tree flat, 16 miles from Duketon, and (2) on the creek, a little below the present soak, and I am not in great hopes of a supply being obtainable at either place, especially at (1)—that is in shallow wells.

"If these wells are put down—and this applies to all shallow wells in the out back country—I would very strongly advise that they should be put down in the summer season, for if a supply is met with then it can fairly safely be relied upon as permanent, whereas if they are put down in the winter—usually the wet season—a fairly heavy supply of soakage water is often met with which goes dry, or nearly so, before the dry season is over, and this is often a very serious matter in that part of the State. The Cosmo Newberry Government No. 2 Well is a case in point; this well is now only making a few gallons of water per day, and that only after it has been sunk another five or six feet by private parties."

Windanya Group of Leases, Broad Arrow Goldfield.—In the month of June Mr. Woodward prepared the following report upon the Windanya Leases, near Broad Arrow:—

SITUATION.—Windanya* is situated about four miles in a south-westerly direction from Bardoc, a town upon the eastern railway line 418 miles from Fremantle and 31 from Kalgoorlie.

GEOLOGY.—*Superficial Deposits.*—The area in which this group of leases is situated may be described as a valley running in a north-westerly and south-easterly direction of about four and a-half miles in length by half a mile in width, the surface of which is covered by a deposit of rich red loamy soil broken by two small patches of diorite boulders towards the southern extremity, the only indication of the presence of quartz reefs being lines of strewn fragments of quartz.

Laterite.—This valley is enclosed upon its eastern and western sides by lines of low ironstone-capped hills (laterite).

Schists.—The basic series are here represented by hornblende schists met with in sinking beneath the red loam of the flats, and are found to be much weathered above the water level (about 200 feet), and even below it in the immediate vicinity of the lodes.

Granite and Porphyry.—The acid series are represented by a granite intrusion, which outcrops in one of the patches of diorite towards the south end of the valley and by numerous small porphyritic dykes met with in the lodes.

Quartz Reefs.—The quartz reefs in the oxidised zone are much iron-stained and often contain vughs filled with gossan, which are generally rich in gold. Below the water level the quartz assumes a more banded appearance, and often contains pyrites in considerable quantities which in the vughs sometimes

* Vide Lithograph I 17, issued by the Department of Mines.