2.—REPORT ON SOME SUGGESTED DAM SITES ON THE MURRAY RIVER.

(T. Blatchford, B.A.)

General Geology.

The Murray River in its upper course through the Darling Ranges passes through gorges cut out of granite rocks which are partly normal biotite granite, partly biotite gneiss. Numerous basic dykes intrude these granite matrices and form a broad network, the dykes striking in no regular directions. Their occurrence is similar in every respect to the dykes in the reservoir catchments at Mundaring, Canning, etc. The only other rock types are the weathered products of the granites and dykes, which, owing to the steep incline of the river banks and the narrow valley are of no great extent.

Suggested Dam Sites.

Several possible sites had previously been chosen by Mr. Dumas, but by mutual consent we reduced the number to three as being the most promising for the purpose required. To avoid possible confusion these three sites have been marked by the letters A. B. C., the first being the furthest up stream. Before going further with this report, I would like to make it clear here that nothing up to the present has been done in the way of accurate surveying or testing of the sites suggested. The whole scheme is still in the preliminary stage, and my observations are only to be taken as a help from a purely geological aspect in choosing what appear on the surface to be the most likely sites on which to concentrate by the usual engineering methods of testing out before actual construction is undertaken.

Site A.—This site is in a comparatively narrow section of the gorge and where there is high granite bottom and fairly steep sides, particularly the north bank.

The water at present is flowing through a narrow channel close up to the north bank.

North Bank.—This bank shows massive granite outcrops with very little covering. As usual the granite is jointed, but the joints are not numerous and appear to have a prevailing course parallel to the stream.

Bottom.—With the exception of the narrow portion above referred to the bottom as a whole is on massive granite with few joints.

South Bank.—This bank is not so massive or steep as the north bank. It has very little covering, however, and has the appearance of being massive.

At the base of the south bank a narrow basic dyke outcrops and apparently strikes more or less parallel with the river. This dyke is of no great width and as far as can be seen at present makes a close contact with the granite.

Geologically the main points are:—

(a) The north bank is steep and apparently massive.

(b) The south bank, though not so steep, has no great covering and will probably prove massive at no great depth.

(c) The only dyke and the main joints run parallel with the stream.

Site B.—This site is also in a narrow section of the gorge.

North Bank.—This bank is probably the most massive granite in any of the sections and presents a bare granite face, free from external joints. The only testing required would be for internal "flaking."

South Bank.—Unfortunately this bank is more broken than usual. It has a steep slope, however, with comparatively little earth covering. There is no reason to doubt that the rock will not become massive at a reasonable depth below the surface.

The Bottom.—The bottom is quite solid, and though mixed with a little dyke material, the two rocks are found to be "frozen" together, so there is no difficulty in that direction.

As in the case of Site A, a narrow dyke occurs at the base of the south bank and apparently strikes parallel to the water course.

The advantages of this site are:—

(a) Though lower than Site A it is considerably higher than Site C.

(b) The north bank appears to be almost ideal, while the south bank is fairly satisfactory and the bottom quite good.

It compares favourably with Site A, except that its base would be several feet lower.

Site C.—This site differs geologically from the first two in that a weir would be set on a very broad basic dyke which crosses the river more or less at right angles to the stream.

At the surface the dyke is very much jointed, and it would depend entirely on these joints going down too deep as to whether this site would be suitable. This, and the fact that the site is considerably lower than the first two, appear to me the controlling factors, for otherwise the bottoms, walls and span would all be satisfactory.

Conclusions.

I consider that any of these three sites chosen by Mr. Dumas would probably be suitable for the erection of a concrete dam, but recommend that before a final choice is made the usual testing out by sinking trial holes, etc., be first carried out. The choice will also largely depend on a survey of the sections and estimate in each case of the quantity of water impounded.

I would very much like to make another visit when this preliminary work has been completed.

3.—REPORT ON AN ALLUVIAL GOLD FIND ON YINIDING CREEK EIGHT MILES SOUTH-WEST OF TOODYAY.

(T. Blatchford, B.A.)

General Remarks.

Gold was first found by Prospector Brown near Yiniding Creek on Block 198, when he was looking for tin. He followed up the creek obtaining traces of gold as far south as his P.A. 44.

Since the discovery other prospectors have located gold on the sides of the hills flanking the creek, the reported recoveries now amounting in all to about 20 ozs.

As there is no water available for sluicing, the gold is recovered by passing the dirt through dry blowers or shakers.

Geology.

Although the slopes of the hills are largely covered with surface soils, there are sufficient rock outcrops and shafts to show that the country rocks consist of several types, amongst which the most important are normal granites, with their accompanying pegmatitic veins, epidiorite dykes, fine silky micaceous schists, quartzites and andalusite schists. With the exception of the first two, the remainder are old sedimentary types, which have been metamorphosed into their present form. These sediments are without doubt of Pre-Cambrian age and are possibly counterparts of the same rocks which occur in the Yilgarn, Coolgardie, N.E. and N. Coolgardie Goldfields, and which in many instances carry gold-bearing lodes and reefs.

The area had previously been examined by Professor Clarke, who has also mapped a narrow strip of country containing the same types, lying west of the Midland railway line and extending from Moora north to Mingenew.

Origin of the Gold.

The origin of the gold is, in my opinion, due to two sources: (a) ironstone leaders, (b) quartz leaders or reefs.

In a shaft sunk by Brown near the boundary of P.A. 45 he has cut through a series of ironstone leaders, one of which he assured me gave traces of gold sufficient to indicate that this is undoubtedly one of the sources. The shaft has been sunk near the edge of a heavy laterite covering in a rock which has every appearance of a weathered granite, though it may possibly be a gritty arkosic sediment. The frequent occurrence of quartz floaters and vein quartz in some of the other shallow shafts would suggest these as a second possible source of the gold, though so far no one seems to have found quartz veins carrying gold.

Occurrence of the Gold.

As far as could be ascertained, small quantities of gold are scattered over quite a considerable area, so far mostly on the hill slopes on the southern bank of Yiniding Creek. I am led to believe that the richest claim is in the creek bed. Gold has also been reported as occurring on a branch creek which passes through P.A. 51.

The gold I saw was what is usually termed "rough shotty," that is, fairly coarse angular pieces from a few grains in weight up to a reported piece of two ounces.

In comparison there is apparently very little fine gold.

The gold-bearing dirt on the slopes of the hills is shallow and lies on a clay or rock bottom. So far no deep ground has been found on the slopes. In the bed of the creek the wash is sometimes deeper, but owing to the steep sides has no great width.

As there are many on the field who have had little experience in mining, it would perhaps be as well to sound a note of warning as to the disabilities which will arise when the rainy season commences. In the first place it will not be practicable to use the dry-blowers or shakers, for the loam containing the gold has quite a large quantity of clay contents and will not readily dry sufficiently to be suitable for this treatment. If there is any intention of sluicing the material in the creek bed, the dirt should be thrown out before the creek commences to run, otherwise it will be found very difficult to work.

There is still another point that may be useful to the prospector. It is evident that nothing big in the way of alluvial gold will be found on the slopes or the upper reaches of Yiniding Creek itself, but if the gold found on the slopes is indicative of what may have been washed away in the past ages, there is at least a chance of richer accumulations occurring in the more extensive alluvial flats lower down the stream, and possibly in the Avon River itself. I therefore advise those who hold unpayable claims and who wish to continue prospecting, to try out the lower ground on a possibility, rather than continue where there is little or no hope of success.

Conclusions.

There is no doubt that small quantities of surface or alluvial gold occur over a considerable area at the head of Yiniding Creek, and I consider there is just a possibility of deeper auriferous alluvial ground being found on the flats lower down the creek, or in the Avon River.

There is also, of course, a chance of finding ironstone or quartz leaders carrying payable gold.

At present the number of men, 102 on the day of our visit, is excessive, and till something more promising is found, further prospectors should be discouraged from going on to the field.

4.—REPORT ON THE COASTAL LIME-SANDS.

(T. Blatchford, B.A.)

Owing partly to a discovery of a lime sand deposit near Quininup Brook which yielded a result of 84 per cent. lime carbonate, and partly the need for soluble lime compounds for agricultural and pastoral purposes, an investigation of this deposit was required, which eventually lead to several other coastal lime sand deposits being examined, the results of which are as follows:—

Geology.

Lime sand dunes occur right along the fringe of the western coastline from Augusta on the south to at least as far north as Geraldton on the north.

The origin of these heaps is no doubt due to the breaking up of marine shells by wave action against the beaches, and winds mixing these fragments with sand and heaping the particles up into dunes and ridges.

In all instances the composition is essentially the same though the proportions of sand and shell vary very considerably; the former—sand—apparently predominating near the mouths of rivers—for example, at Bunbury and Fremantle. At the base of some of the heaps, and particularly on the shoreline, black sand (magnetic iron oxide) and titaniferous iron are evident, but not in the main heaps themselves, which are relatively free of these heavier fractions.

Quininup Brook Deposit.

The Quininup Brook deposit lies a short distance in from the coast and seven miles south of Yallingup.