way of prospecting, but the boring machine will soon test the country, and I have great hopes of their finding fresh water in the flat a little to the South-East of Golden Valley, which is divided from the salt flats by some hard ridges of rock.

Prospectors who intend to test their claims would also do well to construct dams before the rains; but these will have to be puddled when the first shower falls, as the sandy loam of the gullies will not hold water unless it be puddled, when it becomes quite impervious.

The country to the East and South, as far as I can judge from a distance, appears to be similar in character, and I hope as soon as the rain sets in to be able to take a long trip in the direction of the Hampton Plains.

As a whole this country is very promising, and I hope that it will be thoroughly prospected as soon as there is rain. Rich alluvial deposits will probably be found both in the Golden Valley itself and in the South.

I returned by the York road, which passes through very similar country, but as it follows for the most part the low drainage line, it is, from a geological point of view, very uninteresting; moreover, the scrub and thickets are so dense that it is a very rare thing to get a glimpse of the surrounding country, and, with the exception of Mt. Stirling, very few hills of any size are seen. There is, however, one point on the road of some interest, where some nice looking quartz reefs cross the schistose rocks near Nulligan.

All the rocks crossed on this line have a N. and S. strike, but a variable dip sometimes E. and sometimes W., for as they are always inclined at a very high angle, little change is required to turn the dip from one direction to the other.

SECOND REPORT.

Issued in May, 1888.

York to Northam, Newcastle, New Norcia, and the Wongan Hills.

To the North of York the road follows for some distance the valley of the Avon, passing over hard crystalline rocks, *e.g.*, hornblende schist, gneiss, and granite, with numerous dykes and quartz veins; some of the latter are iron-stained and of a granular character, much resembling the auriferous stone of some parts of the Colony.

On leaving the river the road crosses a small rise, capped with clay and clay ironstone, then descends into the valley of the Mortlock, where rocks similar to those nearer York are met.

Between Northam and Newcastle the river flows North-West through a rocky gorge, which in all probability follows a fault occurring across the strike of the series of schistose and gnessic rocks.

The road to the North from Newcastle, for some way follows the Toodyay Brook, then turning North-West crosses a series of very rough schistose hills, after which it passes over high ground covered with sand and clay ironstone for about 30 miles, when, near the junction of the Perth road, the country begins to fall toward the East Moore River, and the crystalline rocks re-appear, with a series of quartz reefs of a very promising character. Similar country extends for about fifteen miles. The road then follows the Victoria Plain, the alluvial deposit of the East Moore River, which has high hills of crystalline rocks on each side. Continuing Eastward, towards the Wongan hills, for a few miles there are ranges

often capped with ironstone gravel, and the remainder of the distance lies over sand plains which here extend much further to the Westward than they do further South.

WONGAN HILLS.—These hills are situated about 60 miles N.N.E. of Newcastle. They appear from the Westward as two or three isolated peaks, but on approach they are found to be the highest points and to form the abrupt termination of a range, which runs from this point in a N.E. direction. They are flat-topped hills, presenting a bold escarpment to the S.W. of about 300ft. above the surrounding clay flats: this face is probably caused by a line of fault, which would also account for the springs near their base.

The rocks are mostly metamorphic and crystalline, hornblende schists with veins of radiated actinolite, small beds of chloritic and micaceous schists and small quartz veins. These rocks strike N.E. and S.W., following the direction of the range, dipping at an angle of 60° to the N.W., and making their appearance again in a small hill to the N. called the Little Wongan. Granite rocks form the low ridges to the N. and S.; they are often almost covered by sand or ironstone conglomerate.

The highest peaks of the range are capped by a ferruginous conglomerate, nodular clay ironstone gravels, intermixed with sand or clay, clays and ferruginous sandstones horizontally bedded. These beds also cap the low granite ridge, but occupy many different elevations owing to the upheaval of the Wongan to the N.E. of the fault.

The recent deposits are sand, clay, and loam. Of these the sand greatly predominates, forming large plains to the W. and N., occasionally interrupted by large salt flats and clay pans.

The loam forms patches of rich red soil (generally thickly timbered with gimlet wood).

There is very little to be seen of the Plutonic rocks at the surface; a few small diorite dykes occur in the range, and probably some of the granites at the low foot hill are intrusive.

Quartz in this district is quite a rarity, and what there is of it is of a yellow glassy appearance, containing either pyrites or brown hematite.

Gold has been discovered on Mr. Paine's claim, which is situated on the top of the Little Wongan, a small hill about 6 miles North of the range. The reef is about 18in. wide, between well defined walls, dipping at an angle of about 65° in a N.W. direction, its outcrop following the strike of the rocks N.E. and S.W. At present they are engaged in testing it in depth, and are down about 10ft., in very hard ground; they have not opened the reef along its outcrop sufficiently to determine what body of stone carries gold, but where they are sinking they have obtained very good specimens and prospects, both from the reef and the casing. This reef is worth opening up, but unless it proves very rich, or makes a larger body of stone for some distance along its course, it will not pay to work, as the reef itself is so small, and the country so hard.

A prospect has also been obtained from a small hill to the South of the latter, held by Messrs. Glyde and party. The reef runs in a N. and S. direction, dipping at an angle of about 25° W. The stone here is very similar to Mr. Paine's, but contains more hematite: the size of the reef as yet is unknown, as they have not yet sunk through it, and the workings are too much in their infancy for me to express an opinion. Very few of the other claims have any sign of a reef at all on them, but were taken up, in the hope, I imagine, of striking a reef in depth, and this idea I would strongly advise prospectors to give up till we know something more of the behaviour of reefs in this particular district.

From the nature of the rocks and the great scarcity of quartz in the part of the district I have seen, I do not see any prospect of its turning out a rich gold-field, but if prospectors intend to give it a trial, I would advise them to go prepared to make some flying trips to the N.E., as the ground all around the present discovery is already taken up, and nothing is left but clay or sand flats.

South of the Wongan Hill, for some miles, there are nothing but sand plains and salt lakes or swamps, but where the ground rises more towards the ranges clay ironstone, ferruginous sandstones and clay make their appearance, and here and there an outcrop of rock is exposed in some of the deep gullies. From Bulgate the road descends into the valley of the Toodyay Brook, where the same rocks are met with as were first passed over on leaving Newcastle.

THIRD REPORT.

Issued in July, 1888.

Cossack, Roebourne, Mallina, Peeawah, Croydon, the Pyramid, and Wood Brook.

Cossack.—The first thing that strikes one on landing at Cossack is the black appearance of the rocks and the black streaks down the faces of many of the cliffs, which, from the sea, look as though tar had been poured down them. These streaks were at first taken for coal, but as they would not burn were put down as of volcanic origin, and indeed this part of the country presents at first sight very much that appearance; however, on examination, they proved to be veins of black tourmaline in a compact hornblende rock, evidently intrusive, as it has no signs of bedding, and much resembles diorite in character. There are also veins of quartz and hornblende, the latter generally very green in color, intersecting these rocks. These rocks form the rough bold cliffs and headlands which separate the sea from the low salt swamps that lie between Cossack and Roebourne. The sea finds its way round the back of these rocks at spring tides, covering them with a layer of water which evaporates before the next high tides, leaving its burden of salt.

On the Roebourne side of this swamp some low rocky ridges of ferruginous quartz make their appearance through the alluvium of the plain, and in these gold is said to have been found some years ago. The stone looks very well, but so many more tempting things have been found in the district that no attention has been paid to them of late.

Roebourne is situated eight miles inland from Cossack on the Western side of the Harding river. It is built round the base of a hill called Mt. Welcome, which forms the Eastern end of a small range following the coast in a South-Westerly direction. The rocks of this range are very similar in appearance to those of Cossack, but as they show signs of bedding must be of sedimentary origin. They contain many dykes. On the Eastern side of the large alluvial flat of the Harding, which is about eight miles wide, is Mount Hall. This small range is composed of hornblende schists with trap dykes, and lies in the fork of the Harding, which a little higher up has split into two branches, one, the Western, flowing through a gorge past Roebourne into the sea at Cossack, and the other, the East Harding, flowing through the large alluvial flat it has formed, and which joins the large alluvial plain which here stretches all along the coast up to the ranges, which in some places are thirty miles inland. The surface of this plain is often broken by low ridges of rock, and it is skirted along