

REPORT ON THE OCCURRENCE OF COAL
NEAR CATAMARAN RIVER, RECHERCHE
BAY.

(One Plan.)

Government Geologist's Office,
Launceston, 20th February, 1902.

SIR,

I HAVE the honour to report that, in accordance with your instructions, I examined the seam of coal near Catamaran Creek, Recherche Bay, on the 4th January. Ordinarily, only barges of 60 or 70 tons burden make the voyage, but I had the advantage of a special trip by the s.s. *Nubeena*, with the Honourable the Minister of Mines and others. The ordinary barges, I understand, draw about 6 feet, and go alongside the wharf, where there are 9 feet of water at high tide. A little way out from the mouth of the river there is deep water, and harbour works would be necessary in the event of a large trade. For the present, these would probably not be required.

Recherche numbers 50 or 60 inhabitants, about half of whom are employed at Messrs. M'Dougall's sawmills. It is the most southerly settlement down the Channel. The bay, from its position, is sheltered from westerly storms, but is fully exposed to weather from the south-east. The dangerous-looking reefs out at sea, in front of the bay, carry in their significant names reminders of several disastrous wrecks.

Due west from the bay the country is flat for about a mile, and is not more than 50 to 80 feet above the sea; it then rises into spurs of a coastal range of hills.

GEOLOGY.

Some of the reefs at sea are known to consist of diabase (dolerite), and the same rock is seen at sea-level at Recherche itself. The flat land and the lower part of the hills, however, are formed of sandstone, crowned on the summits by diabase. The same problem as that which constantly confronts the observer in other parts of the Island is present here, viz., whether these sandstones pass below the diabase caps, or whether they are abruptly cut off by an intrusive mass. My observations so far lead me to conclude that

both of these phenomena have occurred in different localities, and that each case must stand on its own merits. At Recherche, I could see nothing to guide me in forming an opinion as to what happened there. Intrusive dykes have been reported by Dr. Milligan to the south of Recherche, but these are quite compatible with the diabase on the mountain top overspreading the coal measure sandstones.

A belt of sandstone appears to fringe the coast from Southport to Recherche. Coal seams and carbonaceous markings are contained in these beds, and the impressions of fossil plants point to some of them being the lower members of the Mesozoic. The Southport and Ida Bay strata, containing *Pecopteris lunensis* (R. M. Johnston), *Vertebraria australis* (M'Coy), plentifully [at Southport], and *Zeugophyllites elongatus* (Morris), sparingly [at Ida Bay], seem almost to be passage-beds between the Permo-Carboniferous and Mesozoic, or, perhaps, the lowest beds of the Mesozoic. The beds at Recherche are a step higher, being decisively Mesozoic, as they contain the characteristic plants of the Upper Coal Measures in Tasmania. Mr. R. M. Johnston on this occasion quickly collected from the spoil heap *Thinnfeldia odontopteroides*, var. *obtusifolia* (R. M. J.), *Zeugophyllites elongatus* (Morris), and *Phyllothea australis* (Brongt.); and Mr. M'Dougall gave me a fine specimen of the first-named plant.

The following table will give an idea of the geological horizons of these beds:—

UPPER MESOZOIC	Recherche Coal	<i>Fossil Plants.</i> <i>Thinnfeldia odontopteroides</i> , var. <i>obtusifolia</i> (R. M. J.) <i>Zeugophyllites elongatus</i> (Morris) <i>Phyllothea australis</i> (Brongt)
	Ida Bay Coal	<i>Pecopteris lunensis</i> (R. M. J.) <i>Zeugophyllites elongatus</i> (Morris) <i>Vertebraria australis</i> (M'Coy)
LOWER MESOZOIC	Lower Sandstones	<i>Vertebraria australis</i> (M'Coy)
	Southport Coal	<i>Pecopteris lunensis</i> (R. M. J.) <i>Vertebraria australis</i> (M'Coy)
PERMO-CAR- BONIFEROUS	Mt. Cygnet Coal	<i>Vertebraria australis</i> (M'Coy) <i>Gangamopteris spatulata</i> (M'Coy)

The exact position of the Southport beds is, perhaps, still doubtful, but, at any rate, that of the Recherche seams is well established. The characteristic plants of the Lower Coal Measures, *Glossopteris* and *Gangamopteris*, are absent, while *Thinnfeldia* and *Zeugophyllites*, the Upper Coal Measure plants, are present.

DESCRIPTION OF SEAM.

The seam which I visited at Recherche is situated on Section 5248-93M, 317 acres, in the name of Major Lloyd Hood, north of and adjoining Catamaran River. It has been opened upon by a couple of shafts, a little over a mile due west of the harbour. The track to it is an easy one, along an old abandoned wooden tramway, formerly used for conveying timber to Messrs. M'Dougall's sawmill. One shaft was under water, and had, I was told, been sunk for the purpose of draining the other, which had been cleaned out for this visit. The latter had been sunk to the floor of the first coal seam, a depth of 21 feet, and presented the following section, as far as I could identify it in the wet weather which prevailed at the time:—

Soil.....	11 ft. 6 inches.	
Coal.....		10 inches.
Dark matter, undetermined.....	1 ft.	2 "
Coal, mixed with clay.....		4 "
Clay.....		3 "
Soft mixture.....		2 "
Coal.....		6 "
Parting.....		2 "
Coal.....		3 "
Splint coal.....		3 "
Coal.....	1 ft.	11 "
Parting.....		$\frac{1}{2}$ "
Coal.....		9 "
Band.....		3 "
Clean coal.....	2 ft.	8 "
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		9 ft. 6 $\frac{1}{2}$ "
Clay.....	said to be	8 ft.
Coal.....	said to be	7 ft.
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Total.....		24 ft. 6 $\frac{1}{2}$ inches

In the above 9 ft. 6 in. seam I believe there will be found to be, approximately, 6 feet of workable coal; the rest is clayey and dirty, or shaly. I was informed that a second seam exists 8 feet lower down, and has been proved by a drill to 7 feet thickness.

The coal in the upper part of the top seam is decidedly inferior in quality to that of the layers which rest upon the

clay floor. This is what might have been expected, as the sandstone roof is here absent, and the soft soil offers no obstruction to the downward percolation of water, which must necessarily affect the upper layers of coal injuriously. As the standing water had only been recently bailed from the shaft, I do not consider the samples which I caused to be broken from the seam can give quite fair criteria of the quality, but they were amply sufficient for comparison with many other assays of Tasmanian coal seams examined under similar conditions.

From the samples, which were broken from the seam in the presence of the Honourable the Minister of Mines, I selected a block large enough for a fair assay, and one which, in its solidity and variety of structure, fairly represented the average quality of the seam. The coal was dull black, with some shining layers passing through it. It has been assayed by Mr. W. F. Ward, Government Analyst, who has reported as follows:—

“The coal was evidently ‘weathered,’ which has probably lessened its coking qualities and increased the moisture. Different portions of the lump varied greatly in appearance. It was therefore sampled in two separate portions, with results following:—

	Top. Per cent.	Bottom. Per cent.	
Fixed carbon.....	65·8	66·7	} Coke
Ash (white and very light)	8·2	8·6	
Gases, &c., lost at red heat	21·0	20·3	
Moisture lost at 212° F....	5·0	4·4	

The ‘top’ coal gave a soft and powdery residue after heating, the ‘bottom’ coal coked partially, the low ash is a hopeful feature; sulphur was not determined, but judging by the colour of the ash this should be small; a determination of this constituent in a weathered sample is of no value.”

The coal was broken in large pieces from the 2 ft. 8 in. layer at the bottom of the shaft, and the “weathering” referred to by the Analyst may have been due to the weather-side of the sample. The edge of the seam has no doubt been exposed to the water for many months. Although some parts of the sample were dull and others shining, the analysis shows very little practical difference in composition.

It is gratifying to see such a small percentage of ash, while the proportion of fixed carbon is higher than in most Tasmanian coals. It exceeds that of Mt. Nicholas by 15 to 20

units. The nearest approach to it is the Sandfly coal. An analysis of that coal (upper seam) is stated in the Tasmanian Official Record, 1892, p. 118, as—

Water.	Vol. Hydro-carbons.	Fixed Carbon.	Ash.	Sulphur.
5.0	23.8	62.2	8.7	0.8

which approximates in constitution to that of the Catamaran Creek.

As might be anticipated, the high percentage of fixed carbon in this coal causes it to give out a good heat on an open fire.

The steam-raising values of different coals may be calculated from their composition, and hence analyses are highly useful in furnishing an idea of the results to be expected from subsequent trials. It is satisfactory to find in the present instance that the assay results have been confirmed by small working tests by several individuals and companies.

Mr. F. H. Piesse, Manager of the Huon, Channel, and Peninsula Steamship Co., Limited, Hobart, informs me that ten bags of this coal was used on the s.s. *Nubeena*, and the results were so satisfactory that an order was given for twenty tons, which, unfortunately, could not be delivered.

Messrs. O'May Bros., steamship owners, Hobart, report to me that they ran the s.s. *Victory* for one day with the coal, which burned very well indeed. They describe it as a good steaming coal, leaving a nice white ash.

The Hon. W. G. Gibson, M.L.C., writes to me in reply to my enquiries: "Two bags of this coal were burned in my furnace, but this could not be said to be a test or trial worth having. However, it certainly burned very well indeed, and we considered it much superior to any other Tasmanian coal we have had to deal with."

The quality therefore appears to be highly encouraging. Two further questions are, how much coal is likely to be available, and how is it to be worked?

The limits of the sandstone system are visible with difficulty, owing to the scrub and humus which conceal the bed-rock, and would take some time to ascertain, but I believe that it may extend a good way up the hill before meeting with the diabase. A fair-sized area is no doubt available for working.

About three-quarters of a mile north of what I may call the main shaft, another shaft has been sunk through 33 ft. of sandstone, when water prevented further work. This is over the hilltop, to the north of the present shaft.

It is no doubt a continuation of the same measures, and the same seams will probably be found on that side of the hill at a somewhat deeper level, owing to the dip of the strata a little north of west, at an angle of from 6° to 8° .

Another shaft has been sunk half a mile south, but without getting coal.

From the direction of the dip and the proximity of the seam to surface at the main shaft, the same seam cannot be struck nearer to the shore line, but ought to be found in the hills both north and south. Unfortunately, where it has been opened upon it is too near the surface to have a good working roof, and the hill plunges north with the dip of the seam. The latter cannot be expected to gain cover until it has traversed the small valley to the north, and passed under the base of the hill, where the sandstone will protect it. To attempt to follow it along its dip will mean endless trouble with water; though, as a ready make-shift method, this plan seemed to recommend itself to some of those interested, as enabling coal to be got out at once to help pay for development expenses, until the value of the seam is better proved. This is a matter which must be left to those immediately concerned; but for permanent work, shaft-sinking on the northern hill will have to be resorted to.

The occurrence of a lower seam—the alleged 7-ft. seam—below the clay in the bottom of the shaft is encouraging. It is apparently a part of the upper seam, from which it is parted merely by clay.

Before going to any substantial expense in laying out work, the ground ought to be judiciously prospected by boring, for the purpose both of testing the extension of the known seams and their freedom from injurious alteration by the eruptive rock, and also of seeing whether any fresh ones exist in still more favourable positions for working. The locality where the present seam is exposed is well situated with regard to the shore; a tramway of less than a couple of miles would connect it with the wharf, but the distance could be decreased by the discovery of a seam below the flat country traversed by the old tramway. Against such advantage, however, must be placed the drawback of water, of which this low land must hold large quantities.

Altogether, the undertaking has the elements of success. The coal appears to be suitable for domestic and steaming purposes; the position of the field on the shores of an ocean highway and within 60 miles waterway from Hobart is a highly important feature. The only drawback is that the

work will be shaft-mining; but coal ought to be able to bear that cost here, as it does elsewhere. I must repeat that proper precautions should be taken to ascertain by boring the extension and character of the seams before the owners commit themselves to any heavy expenditure on permanent works. First prospecting, then vigorous development. With these, I see no reason why this new coal field should not soon occupy an important position as a producer.

Under the conditions of my visit, no survey was possible, but the annexed sketch map indicates the locality and general geology.

I have the honour to be,
 Sir,
 Your obedient Servant,

W. H. TWELVETREES,
Government Geologist.

W. H. WALLACE, *Esq.*,
Secretary for Mines, Hobart.