

TASMANIA

LEGISLATIVE COUNCIL.



COAL SOUTH OF OATLANDS. (Mr. Gould's Report)

Sir,

GOVERNMENT GEOLOGIST

I have the honor to state the result of my examination of the line of country recently surveyed for the Railway, with reference to the existence of known deposits of Coal, and the probability of further discoveries of it.

Under your instructions, I have made a general Survey of the country adjoining the Line of Railway for several miles on either side, commencing from a point about six miles north of Oatlands and terminating southward at Richmond.

Of the Plans enclosed, No. 1 represents the general structure of the country and approximately shows the distribution as well as extent of the formations met with; while No. 2 contains the details of a Survey, more carefully conducted of the locality in the neighbourhood of Colebrook Dale, which has been investigated minutely.

Throughout the whole distance nearly the same formations are encountered, consisting of the upper and lower coal measure sandstone, and intersecting and overlying masses of trap; none of the rocks older than these disclosing themselves, excepting perhaps at the extremities, both north and south, where small areas are occupied by probable extensions of part of the upper palaeozoic beds, immediately underlying the coal measures. The structure of the country is extremely simple. A table land gently sloping to the north, forming an inclined plane, of which the average elevation at the highest point, near Lake Tiberias, is some 1460 feet from the level of the sea. This is ridged in on either hand by ranges disposed upon the east and west, so as to leave a moderately regular flat valley, varying from five to seven miles in breadth.

The floor of this valley or plain is almost entirely composed of sandstone, the bounding ranges of trap. In the latter pauses or openings occur, from the existence of interruption in the trap; and these conduct to other plains of sandstone at a similar level upon the outer sides of them.

The watershed lies a few miles north of Lake Tiberias.

Ten miles south of Lake Tiberias the table land is abruptly scarped by the valley and gorges of the Coal River and its tributary rivulets, - a fall of some 200 feet taking place between the flat-topped hill at Hunter's Swamp and the upper end of the valley of Jerusalem and the Coal River. Before the latter reaches the lower country it pursues its course for many miles through a deep and narrow gorge, with cliffs on either side of several hundred feet in height, eroded by its own long-continued action on the easily destructible sandstone.

(2)

Southwards the valley of the Coal River expands but little, until after its junction with the White Kangaroo Rivulet, - being limited upon the east, until near that point, by a high and much broken country of sandstone, and upon the west by a series of trap hills, - forming a but little interrupted range extending south-easterly from Mount Mercer and terminating in Gunning's Sugar-loaf; and even south of this the breadth of the valley rarely exceeds one or two miles. In this case also the floor of the valley and the lower grounds are chiefly occupied by sandstones; the main ranges and the summits of some less important hills by trap, which, here as well as on the table land, is in most instances greestone.

Tertiary deposits of gravel conceal the sandstone through the entire breadth of the floor of the valley for some miles north of Richmond, and are themselves overlaid by and associated with flows of vesicular basalt, which occasionally bursts through and is involved with each of the other formations at points of the valley as far as Lower Jerusalem. Interesting tufaceous deposits of fresh-water limestone occur in connection with them in the immediate vicinity of Richmond, from which specimens of many remains of land and fresh-water molluscs have been obtained.

The sandstones are separable into two divisions slightly unconformable to each other; but this is not to be arrived at without great difficulty, from the great resemblance of certain beds in each of them. Continued borings would be necessary, in many instances, to determine this question, and to entirely settle the position of the lower beds in all localities. A sharp quartzose sandstone, more or less ferruginous, in thin layers with much false beddings, and forming a worthless barren country, serves as the type of the upper beds: bluish grey sandstone variegated with dark specks, friable, thickly bedded, alternating with a large proportion of shale and clay, and frequently changing into a fair soil, of the lower; but brownish variegated sandstones frequently occur, of which it is difficult to say, without long and careful examination, whether they are a portion of the upper or lower series.

The upper beds are much more extensively developed throughout the whole line of country examined than the lower, - the position of the latter I have broadly expressed upon the Chart in those localities where I recognised them by a darker shade of colouring, - complete definitions being impossible without a survey on a much more elaborate scale; and it is in this division that the search for coal should principally be conducted, as the Coal is chiefly confined to it; but thin seams and carbonaceous bands also exist in the upper. The line of junction of the two divisions often displays numerous rolled pebbles of shale and sandstone, and fragments of coal from the destruction of the older seams. Fossil woods occur abundantly near the top of the lower division, - silicified trunks of trees of great size being apparently exposed. Fragments of these are occasionally met with on the trap ranges, having apparently been entangled in the flow as it poured over the denuded surface of the sandstone. In the immediate vicinity of the trap ranges and dykes the dip a slight but general and regular rise of both divisions in the north, - the lower, however, rising faster than the upper, - ~~was~~ so that after disappearing under the Flat-top Hill, it emerges upon the York Plains beyond at a higher level.

Throughout the whole of the country examined the occasional occurrence of coal indicates its wide-spread distribution; and it is probable that more important seams than those hitherto discovered would result from the minutely extended search, by means of borings, which would be conducted in the event of cheap

means of transport being provided, - the formation in which the coal occurs being identical with that affording the much thicker seams upon the east and west, along the coast, and at Hamilton respectively.

Inaccessibility has caused no steps to be taken to examine the coal in the numerous places where it occurs; and time did not permit of textending my own operations from the locality near Jerusalem in which I have lately been engaged, under your instruction, in exploring the seams existing there.

From the information of Mr. Jillett, I state that a seam of coal, proved to the thickness of fifteen inches, crops out in the bed of the York Rivulet, in the position indicated on the Plan at the north-east corner of Lot marked J. Lucas, 100; and, from my own observation, that a carbonaceous seam of some thickness contours the hill, some thirty, or forty feet above the level of the plain, lying on the western side of the York Town Rivulet, and known as Mr. Lord's Big Hill, - the position of the seam being indicated by springs. These facts, coupled with the appearance of variegated sandstone, indicated the probability of workable seams existing at a moderate depth along a great portion of the York Plains; and, in fact, within the limits suggested by the dark shading of the Map. South of the York Plains, the country is, to a great extent, occupied by the upper division: and the depths at which coal might be anticipated would, therefore, be increased: but in the valley extending five or six miles north from Lake Tiberias there are again favourable indications of the presence of the lower or coal-bearing divisions. These extend westward also from this point, and then west of Pike's Hill, and in the valley of the Jordan; while coal has actually been discovered - though of what thickness record does not remain - in the River Jordan, and upon Fourteen Tree Plain, in the position indicated on the Map.

Round Lake Tiberias and for some distance south of it, the upper beds predominate, and appear to be of great thickness; and the coal is not again met with until a point three quarters ~~xxxx~~ of a mile on the north of the northernmost boundary of the Coal-mine Reserve, in a creek, descending on the northern side of it from the ~~East~~ Flat-topped Hill. This commences the coal of the Jerusalem Basin; and, throughout the greater part of the distance from this point to the junction of the Coal-mine Rivulet with the Wallaby Creek, it is probable that coal would be discovered by boring at a moderate depth, at a distance of one mile in latitude further down the rivulet. Coal crops out, as is ascertained by shadow sinking, for nearly three quarters of a mile along the course of the Coal-mine Rivulet, as I shall detail presently in referring to Chart No. 2.

East of the Coal-mine Reserve, and starting from the north west of Lot 583, a creek runs easterly to the river; and, in its course, discloses in several places the crop of a seam, which when opened, proved to be three feet in thickness, and probable corresponds with the three-foot seam along the Coal mine Rivulet, and is favourable to the continuity of the seam in the Coal-mine Rivulet beneath the greater portion of the Coal Reserve. This seam was only opened on the crop where it was much decomposed, and time did not permit to put in a drive sufficiently far to get it in the solid; it is, moreover, on private property.

Carbonaceous seams shows at various points in Brewer's Valley and south-east of Jerusalem but coal does not actually crop out until a point in the river about four and a half miles south from that Township, at which a seam is occasionally

exposed, and loose blocks are washed up by floods. It appears to have a large amount of ash, and is chiefly interesting in indicating the position of the lower division. Two points in the Native Hut Rivulet are marked upon the Chart, at which seams of one foot and eighteen inches in thickness crop from among variegated sandstone and coal measures. These also are continued on the eastern side of the Gunning's Sugar-loaf range, in the valley of the same rivulet, down to its junction with the Coal River. The ranges generally, west of the Jerusalem Road, consist of combinations of trap with the upper coal-measure sandstones; and in this part it is, as a rule, only in the beds of the valleys that the lower coal measures are sufficiently denuded for exposure.

Referring now to Chart NO. 2, illustrating the remarks which immediately follow, I have the honor to inform you of the steps taken to prove the extent of the originally discovered seam, which I pointed out in a previous communication to have been worked for some time at a distant date, and favourably reported on by Count Streletzki, and subsequently abandoned, as well as for the purpose of procuring samples from unquestionably the same seam for trial. Having, with some difficulty, discovered the position of the old workings, which had entirely fallen in, and the entrance been concealed beneath the talus of the hill above, I re-opened them and procured samples, which at this present moment, are being submitted to trial, and will be reported upon hereafter.

The cliff in which the open cuttings from I to F are shown exhibits an excellent section of the junction of the upper and lower coal measures, about 20 feet of yellow false-bedded sandstone resting irregularly upon bluish-grey sandstone, and having at the junction fragments of shale, pebbles, &c., as before described, - the entire section being -

- 20 feet upper sandstone, yellow with much false bedding
- 30 feet bluish-grey sandstone, thickly bedded
- 4 feet clod or carbonaceous shale
- 2-6 feet coal.

In following the old workings, which extend for a distance of more than one hundred yards, the thickness of the seam diminishes, and the seam itself in the far end of the workings by what appears to be a local disturbance. The thickness of the seam is very variable, ranging from 2 feet 4 inches to 18 inches in the various open cuttings and shafts in the neighbourhood of the main drive. The average may be taken at two feet; and I have specified it in the reference to the accompanying Plan in the two-foot seam. This seam is stated to have been obtained in the old workings in the branch creek, or Flat-top Rivulet; was struck by myself in a bore at 37 feet at a point just below the junction of the two creeks, and crops at the surface in the drives and open cuttings from south to east near the old workings, and gradually deepens southwards. The last point at which I sought to cut it was about 250 yards south of the main drive on old workings, where it had deepened to eighteen feet from the surface.

North of the workings, I found, by sinking in the bed of the creek to the depth of a few feet in the position marked in upon the Chart, a seam of coal, inferior in quality to the two-foot seam, but exceeding it in thickness, - the section being as follows

	Ft.	Ins
Greyish & yellow sandstone with fine dark streaks	4	8
Carbonaceous Shale	0	2
Coal	0	9
Band	0	1
Coal	1	3
Band	0	1
Coal	1	0
Fire-clay, with plants. Dips west 8 inches in one yard.		

From the dip, this must overlie the two-feet seam (if the strata are regular), and at a distance exceeding 40 feet, the amount of the Cliff Section.

More than half a mile south at a point marked A. a seam occurs differing considerable in section from the former, but which I am forced to consider as identical with it, -especially as results of the bore beneath the two-feet seam show no section that could be considered as the equivalent of either of them for a distance of 200 feet.

The deep bore indicated by the letter L. upon the Chart was carried down two hundred and ten feet from the surface of the ground, or two hundred and one feet beneath the two-feet seam.

- 9 inches of coal were cut at 25 feet
- 15 inches of coal were cut at 61 feet
- 33 inches of coal, with partings between, were cut at 64 feet.

The quality of all these was inferior, and below no other seams were met with, -although numerous bands of shale, and carbonaceous beds indicating coal, were passed through.

Upon the Township of Jerusalem I also bored to the depth of ninety-two feet from the surface, or 47 feet from the bottom of the shaft adjoining the residence of the Roman Catholic Minister, without passing through more than a few inches of coal.

I shall have the honor to present the full details of these Sections, together with the results of the various experiments made upon the Coal, in an Appendix to this Report.

I have the honor to be,
Sir,
Your very obedient Servant,

CHARLES GOULD.

The Hon. The Colonial Secretary.
