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On a discovery of coal at Plenty, Derwent Valley .

Geological Surveyor's Office
Launceston.

20th. May. 1892.

Sir,

I have the honor to report having on the 18th. inst. visited the place where coal was recently found by Mr. Nicholson, about two miles above the Plenty Station on the Derwent Valley Railway. Pieces of coal, some of considerable size, have been from time to time found in the Derwent River near Plenty, but until quite lately none had been got in situ in the original seam. During the recent dry weather the Derwent fell very low, and Mr. Nicholson on passing along its banks, happened to notice coal cropping out just below the water. Some of it was raked out and when dry burned very well, and an analysis is stated to have shown it to be very similar in composition to the Langloh Coal found higher up the Derwent Valley, near Hamilton.

At the time of my visit the river had risen so much that nothing could be seen of the seam, and the only coal I saw was such as had been brought out on to the bank. Some of this appeared a little softened and "perished" by its long contact with the water, but on the whole it looked very well, and I should judge it to be a very fair coal. It is not right to judge a seam of coal only by what is seen at the outcrop, however, for the mineral always deteriorates more or less when exposed for a long time to the atmospheric influences, and it will be necessary to sink on the seam and take out some of it in an unaltered state before a reliable test of its quality can be made. In the meantime the outcrop coal gives us every reason to hope for good results from the body of the seam.

Mr. Nicholson was unable to ascertain the thickness of the bed of coal but believes it to be at least three feet thick, and he has traced it along the stream for over a quarter

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quarter of a mile. The river here runs about S.60 degrees E, and the coal dips in the same direction very slightly, so that it lies just below low water mark for some distance. Above the coal and visible almost always, is a greyish argillaceous sandstone of the variety so characteristic of our Upper Coal Measures. This is rather variable in dip but averages about one in seven towards from S.W. to S.S.W. When the river is high even this sandstone is covered by the water. It is however always to be seen on the North bank, where it crops out in steep little escarpments, and in the cuttings on the railwayline on the south or right hand bank of the river. If the coal dips to the S.S.W. as fast as the dip of the sandstones would indicate, it might be found high up on the rough sideling ground on the north side of the Derwent, but is likely to be covered by the more recent deposits there visible, or is perhaps altogether swept away. To the dip however it ought to be found over an area which makes it worth while exploiting, especially as this can be done very easily and at small cost. It seems likely that the coal will extend over about 200 acres lying between the river and a ridge of greenstone which is seen about half a mile south-west from the outcrop. This intrusive rock is seen in the river at the Railway Bridge at 20 & 3/4 miles from Bridgewater Junction, and again at about 19 1/2 miles, and almost certainly cuts off the coal field. It is the common diabase greenstone so prevalent throughout the district, and shows near the bridge a very shingly cleavage. The Derwent makes a big bend to the South about two miles above Plenty station, and it is in the angle of this bend that the coal bearing sandstones lie. Between the railway and the river at this part the ground is mostly alluvial river flats, formed of gravels of recent deposition, brought down by the now existing stream. These flats are from 15 to 20 feet higher than the usual level of the river, or about the level of the highest recorded floods. The recent gravels cover the coal measure sandstones so that the latter can only be seen in the bed of the river and the sideling ground above the flats. From these last there is a sudden rise to a height of perhaps

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150 feet above the river, where the country again becomes fairly flat on the whole though broken by small ridges and hollows. This higher terrace extends from above the railway line to the greenstone ridge. It is composed of deposits of sand and gravel of Tertiary age capped by scoriaceous basalt flows in places. These superficial deposits altogether obscure the lower carboniferous formation, and boring will have to be resorted to to prove the coal beneath them.

Between the 19½ and 20 mile pegs the railway line rises from the alluvial river flats along the steep sideling almost on to the upper terrace, and the section of the country afforded by its cuttings gives a good idea of the structure of the locality. First there are the coal bearing beds seen in the river, next, on a ^{eroded} ~~shelf~~ ~~eroded~~ out of these are the recent gravels, then ascending the sideling, we again come on the sandstones of the coal-measures lying very much as where seen in the river and still dipping S.W. about 1 in 7; in some of the shale beds among these numerous fragmentary vegetable fossils are to be seen; higher up still we find beds of gravel, clay and sand, horizontally deposited, which seem to have been laid down against the flanks of an old spur of the sandstones; and finally on top of these tertiary gravels is a capping of scoriaceous basalt. This however is not the only basalt flow seen, for there is another and much larger one below the railway at the 20 mile peg which crops out in a rugged little escarpment from 20 to 30 feet in height over a length of several chains. It is not clear what this is resting on, the slope between it and the river being covered with loose blocks of basalt and basaltic clays from the destruction of the main body. A considerable interval must have elapsed between this outpouring of basalt and the next one, for fragments of the lower rock are plentiful in the gravels lying between the two. It is possible that the lower basalt may lie on the coal-measure sandstones, but it is even more likely that there will be tertiary beds between them, and it may be that the ancient basin in which these were laid down was eroded so deep as to destroy the coal seam - as the sandstones are said to

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to be found all along the bed of the river from the coal outcrop to above the place where the basalt is seen, it is however most probable that they have not been greatly scooped out. The fact that the coal is dipping so as to go deeper and deeper as it gets away from the river is also favourable for its preservation. There is therefore a very considerable likelihood of the coal being found under all the basalt and tertiary beds on this right hand bank of the river at this place. On the other bank I have as yet made no examination of the ground, but as it is to the rise of the seam there is not the same probability of the coal having escaped destruction by erosion.

Crossing the Derwent by the Railway Bridge at 20 & 3/4 miles, an extensive flat lies to the West, between the railway and the river. This is cut off from the above mentioned coal-bearing country by a dyke of greenstone, and so far as I could learn, there are no outcrops of the carboniferous sandstones in it. Some eight or more years ago a shaft was sunk in this flat to look for coal but nothing was found except lignite, which shows that the tertiary formation is here pretty deep, probably deeper than the present bed of the Derwent. It is possible that there may be coal measures below the tertiary beds, a question which could be most easily set at rest by boring.

A patch of coal-measure ~~six~~ sandstones showing numerous points of stems and fragments of plants occurs near Mr. Nicholson's house on the Ivanhoe estate, to the South of where the coal has been found about a mile and a half, and separated from the first described sandstones by the ridge of greenstone already mentioned. It is surrounded by greenstone but might contain enough coal to be worth working, its area being perhaps 200 acres. It would be worth while trying this ground by means of a diamond drill bore to see if there is any coal in it.

To test the seam that has been discovered in the

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river I would advise that a shaft be put down at the foot of the siding below where the sandstones show on the railway line. The coal would probably be struck at about 50 feet from the surface. Should it prove to be of a workable thickness and quality a fair amount of stuff could be mined from the shaft without getting dangerously near to the river. While work on the seam was in progress a diamond drill might be used to test the extent of it, and so locate the best position for a main shaft. The prospecting shaft would not be available for this as most of the coal would lie to the dip from it, a position unfavourable for economical working.

Should the coal be of payable thickness and quality the facilities for sending it to market could not be better, as the seam is right under the railway line, and the ground is favourable for making a level siding to connect with it. Should there be any difficulty in taking railway wagons to a main shaft situated above the railway on the higher terrace, it would be easy to connect the shaft by a drive with a line along the alluvial flats.

I have the honor to be, Sir,

Your Obedient Servant,

(Sgd) A. Montgomery M.A.

Geological Surveyor.