GEOLOGICAL SURVEY REPORTS.

Bowen River Coal Deposits.

Memo. to the Under Secretary for Mines.

By B. Dunstan, F.G.S., Government Geologist.

The recent examination by me of the Bowen River Coal Measures extended over the areas known to contain coal at Pelican Creek to the north of Biralee Station and at the Bowen River, near Havilah, between 50 and 60 miles south-west of Bowen.

The formations associated with the coal measures were also examined, and, starting from Eurie Creek, a traverse was made across Strathmore and Pelican Creeks to Biralee Station, then across the Bowen River and Rosella Creek to Havilah, re-crossing the Bowen River to Sonoma and following Pelican Creek up to its source; then to the Bogie River and back to Eurie Creek. A considerable amount of data was accumulated, bearing on the relation of the outcropping measures to the associated marine beds, which will be very useful when working out the geological boundaries for our next geological map of the State.

The special object in view in making the inspection was to enable an opinion being formed on the advisableness of the Government sinking bores to prove the seams of coal known to exist on Pelican Creek and Bowen River, and also to inspect the sites where two bores were sunk many years ago to test the coal measures at these localities. Dr. Jack spent many months about the Bowen River, and, taking his published report as a basis, no difficulty was experienced in finding the places he examined thirty-four years ago. The first bore sunk was on the south side of Pelican Creek, and proved the existence of a good coal seam— the depth being 400 ft. The second bore, on Rosella Creek, near Havilah Station, was sunk on a spot some distance away from the site selected by Dr. Jack, and could not have been sunk in a worse position, being away from the outcrop of the coal seam and close to a mass of intrusive rock. The depth of the bore was 340 ft.

Without going into the details concerning all the coal seams, a description of which has been published in our old reports, it may be stated that there are only two seams which claim receive attention at the present time, the other seams being too small or too dirty, or else too much disturbed by volcanic intrusions to be of consideration. Two other seams have recently been discovered, but their position could not be definitely ascertained. One is said to be near the junction of Pelican Creek and Bowen River, the other being somewhere between Mount Tousaint and Sonoma Station, either on a branch of Pelican Creek or near the head of Strathmore Creek. The information its course it was seen to be destroyed by coming in contact with an intrusive volcanic mass. There is an area close to the outcrop, however, free from disturbance by volcanic rocks, which would make an excellent site for prospecting operations. The ash percentage of the coal, where exposed, is about twenty-four, but this would undoubtedly be less in places where the coal is free from surface influences. The dip is about one in four to the east, but from the inclination of the rocks in the neighbourhood the general dip appears to be towards the west.

The Gorrie seam presents more favourable features than the Daintree seam, and the preliminary prospecting operations should be concentrated on it, more particularly as it is situated about ten miles nearer Bowen than the Daintree seam. For this purpose a land area could be selected on Pelican Creek and a tunnel could be driven in from the high bank of the creek along the strike of the coal seam, and the quality of the coal determined. This work would not be of a permanent character, for the position is just above the level of the stream, but it would do very well for the preliminary stages. With sufficient funds available, however, an underlier could be sunk some distance back from the outcrop on the bank, and coal could be taken out at some level below water level, or at a position where surface weathering has not affected it.

There seems to be an impression that two additional bores should be sunk to prove the coalfield, and also that the Depart- ment should bear the whole expense, but neither of these suggestions can be recommended. I would, however, suggest that a subsidy of say £500 be granted under the usual conditions to any company undertaking the prospecting of the coal seam; and, as the proving of the coal has some bearing on the building of a railway line to the Bowen River, I would further suggest that if a company undertake to spend money on the work they be granted priority over the prospecting area they have proved if they make an application for it whenever the railway line is constructed. I think a company prospecting in this small way would produce very much more satisfactory results than those obtained by the Department in sinking the two bores referred to above at a cost of £2,469.

If a subsidy be granted and a company be formed to undertake the work, the operations to take in hand would be to engage the services of a thoroughly practical coal miner and special qualifications in prospecting work, allow him to spend some time on the ground to become acquainted with all the rock outcrop, then to let him decide what area to work and whether to put a tunnel into the bank of the creek above, or even below, flood level, or to sink an underlier on the outcrop some distance away from the creek. A consignment of the coal could then be brought to Brisbane and experiments tried with it by the Department to determine its economic value.

Tannymorel Coal Mine

By E. O. Marks, B.A., B.E., Assistant Government Geologist.

Tannymorel township is situated on the Killarney Railway, 23 miles from Warwick. The colliery, some 3½ miles from the township, is connected with the main line by a branch railway, the property of the local Shire Council, but which is leased by the colliery company and worked for them by the Railway Department. The line runs beside the road from Tannymorel up Farm Creek, and traverses splendid agricultural country throughout.

The mine, with its attendant residences, is situated amongst picturesque surroundings on a small confluent of Farm Creek, known as Hurtle Gully, or Coalpit Creek.

The outcrop of coal in this locality have been known for many years, and were reported on by Dr. Jack in 1891. * Of the history of the mining operations little information is to be gleaned from the official sources of the Mines Department. Recent records, however, give the output, which for the year 1911 reached the respectable total of 27,022 tons.


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The mine is situated on portions 560, 290, and 6v, parish of Cunningham; and through these portions Hurdle Gully runs from east to west. The coal measures dip at 1 in 20 in a direction only a few degrees north of east, so that the main levels, following the strike of the strata, run approximately north and south, the workings being situated on both sides of as well as under the bed of the creek.

There are two openings, a vertical ladder shaft and an underlie, on the north side of the creek, but the main shaft (up which all the coal is hauled), as well as several shafts now disused or used only for ventilation, are on the south side of the creek.

The main shaft is 75 ft. deep, and in the main levels running north and south from this the hauling is accomplished by a pony. With the exception of one drive, no work has been done to the dip of these levels, so that the seam in that direction is practically untried. All the workings lie to the rise, or within a width of 20 chains, and extend for about 34 chains along the strike of the seam.

While, as is to be expected, the individual layers composing the coal seam vary somewhat in thickness in different parts of the mine, the following measurements (Fig. 1) show that the seam is reasonably constant, while it shows in the only drive to the dip of the main levels a tendency to increase rather than diminish in thickness:

![Diagram of coal seam](image)

In the main workings another seam has been exposed above that being worked, and this measures as in Fig. 2.

![Graph of coal seam measurements](image)

Though the seam worked is a small one, the coal is of excellent quality, as may be judged from the following analysis, by the Government Analyst, of a sample taken from the railway trucks at the mine:

<table>
<thead>
<tr>
<th>Coal Grade</th>
<th>Moisture</th>
<th>Volatile Matter</th>
<th>Fixed Carbon</th>
<th>Ash</th>
</tr>
</thead>
<tbody>
<tr>
<td>3&quot; Coal</td>
<td>3.35%</td>
<td>59.85%</td>
<td>42%</td>
<td>9.4</td>
</tr>
<tr>
<td>4&quot; Coal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; Band</td>
<td>3.35%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Coal</td>
<td>3.35%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Though the strata are not free from faults, these are not so numerous nor so great as to seriously hinder the mining operations.

A little prospecting work has been done in places further up the gully, the most promising being on an outcrop about a mile from the mine. The country here is very rough, the high hills on either side of the gully consisting of basalt, which in places forms bold escarpments. One section in the bank of Hurdle Gully shows a horizontal sheet of basalt, only the upper part of which is visible, and this is overlain by carbonaceous shales, also practically horizontal. Near its margin the basalt becomes vesicular, as one would expect in the case of a lava flow, but Mr. Roach, the manager of the mine, informs the writer that on excavation the shale in contact with the basalt appears to have been baked by it, an appearance it does not possess where exposed to the weather. This being the case the basalt must be regarded as a sill intruded into the strata, and not as a contemporaneous flow. This question as to the age of the basalt will necessarily be of
considerable importance when the coal is worked further up the creek than at present, and is one which is the subject of some controversy.

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The writer is indebted to Mr. Roach for his courtesy in showing him over the workings as well as the surface features.

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seen about buying them, because he would lose the lead; and, while the lead smelter would take them and ultimately recover both metals, that was accomplished only by a long drawn-out process and by suffering a large loss of the metals, especially of the lead. Several years ago, however, the problem of converting lead-copper matte and collecting the lead fume by bag filtration was successfully worked out at the Omaha plant of the American Smelting and Refining Company, and also at the Perth Amboy plant of the same company, and we suppose that a similar procedure would now be followed in any new smelting works. In the conducting of a custom business, especially, it is nowadays rather essential to possess a combination plant, a copper smelter who is unable to receive lead-bearing ore being at a disadvantage. This was fully recognised by Mr. Mathewson in his designing of the Tooele plant of the International Smelting and Refining Company, and was undoubtedly one of the reasons leading that company into the lead business.

This company provided itself with adequate means for the treatment of lead-copper matte, which is no longer a bug-bear. Such matte at Tooele is blown up without re-concentration, the lead being partly collected as fume from the filtering bags (of wool) and partly being scorified, entering the converter slag, which latter is of sufficient tenor in lead to be returned to the lead-smelting furnaces. The Tooele plant is reported in other respects to be an exhibition of the most modern development of lead-smelting practice. Dwight and Lloyd sinterers take the place of the old-fashioned roasting furnaces. The blast furnaces are large and of up-to-date design. Fumes are filtered through bags. And, finally, as an innovation, the time-honoured practice of bedding the furnace charges has been discarded in favour of an actual weighing out of each constituent. The last feature results in a perfection of mixture which is said greatly to promote the running of the blast furnaces which, of course, is in the line of what ought to be expected.—” Engineering and Mining Journal.”

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"Curie," the Standard for Radium.—A conference of all civilised nations requested Mrs. Curie, the well-known radium scientist, to establish a standard for the measurement of radium and radio-activity. Mrs. Curie took up this work with great zeal and brought it to a successful finish. She established a standard by which the radioactivity will be uniformly measured throughout the world, and through which in future all radio-activity may be determined. In honour of the famous scientist the standard measurement is called "curie." It is very interesting to get acquainted with the full particulars of this "curie." The "curie" consists of pure radium which has been produced by Mrs. Curie herself in her own laboratory. It has the form of a tube, is 30 millimetres long, 3 millimetres thick, and weighs 2 gram. But in medical use there are only quantities of -001 gram, since larger quantities are not supplied. The quantity of the emanation from -001 gram of radium is called one "milli-curie." This measurement probably will be before long the standard for radium measurements. The Governments of Germany, England, and Italy have already taken steps to secure for their respective countries standard measurements for radio-activity. The "normalurie," created by Mrs. Curie, will be preserved at Breteuil, near Paris, and deposited there at the "Bureau International," in which is also a standard metre measurement that can be affected neither by heat nor cold. The weights and measures preserved in this "Bureau International" will therefore be enriched by the most modern of all measurements, the "normalurie." It took Mrs. Curie more than two years to finish her work.—"Mines and Minerals."