

**Report upon possible Coal country at Swan Bay  
and Saltwater Creek on the river Tamar.**

**Government Geologist's office,  
Launceston, 26th May 1903.**

Sir,

Agreeably to your instructions, on the 6<sup>th</sup> and 13<sup>th</sup> inst I visited Swan Bay and Medwin's Reach on the east bank of the Tamar, where shaft sinking is going on in search of coal. I also examined the country on the opposite shore between Grayally Beach and Mr Plummer's at Rosevears for indications of the existence of coal measures.

Three shafts were being sunk, one at Roberts landing, Swan Bay on the river bank in diabase rock (eruptive trap on bluestone), another, 45 feet deep, (Traill's shaft) on the shore just inside the south boundary of Coward's farm, and a third, 30 feet deep, a mile further south on the beach on Medwin's property. The two latter shafts are in the ligneous clays of the lower Tertiaries of the Launceston basin. The first 20 feet of Traill's shaft are in clay mixed with carbonaceous matter, succeeded by grey ligneous clay for 15 feet, then by two feet of dense purplish clay containing black woody stems: then by one foot of white sand: then by three feet of greenish ligneous clay containing pebbles: and at the bottom are five feet of dark green clay with lignite and much pyrites. Above these clays the river bank shows soft sandstones in horizontal layers with flats seams of earthy and concretionary brown hematite. The whole series is capped by raised shingle beds of the modern river. A good deal of the brown hematite has been from the ferruginous seams in the country and is spread over the river beach. Mr Coward at one time sent a shaft behind his house some 20 feet into the same lignite formations as is seen in Traill's shaft.

These tertiary beds have been observed fringing the banks of the Tamar at intervals from Launceston to Beauty Point and are everywhere characterised by their lignite, fossil wood and carbonaceous clays. Well known instances occur near Muddy Creek at Supply River, Windermere, Wilson etc. At Mr Plummer's place near Rosevears I examined the positions of two shafts sunk in these clays, one 60 years back the other over 20 years ago. The latter is 90 feet deep in clay with a good deal of shining lignite in it: at the bottom the ground became harder and work was discontinued. At Plummer's Point below the house the soft yellow Tertiary sands are seen in flat beds dipping gently eastwards. The beach is shown with stones of concretionary clayey ironstone. Below Mr Joetze's house half a mile lower down the river I was told that the pipe clay of this series was found on the beach in a narrow seam.

The clays and sands of the Windmill Hill, Launceston are examples of this formation and show similar ironstone layers to those lower down the river. Dredging is said to have brought up lignite from the bed of the Tamar where it forks into the north and south Esk's, so there is reason to believe that a seam of this material underlies the city of Launceston. At Evandale junction the lignite occurs again and carries globules of resin, a substance which also occurs in lumps in Medwin's shaft on the Tamar. The only shells found in the whole series are freshwater ones. All this shows that we are dealing with the remains of an extensive freshwater formation in which was accumulated a good deal of timber and other vegetable matter. This matter is sometimes scattered through the beds and sometimes collected and converted into a more or less dense carbonaceous substance. Frequently this is quite woody, occasionally jet like or a typical lignite: mostly however it has a large admixture of clay, 40% or 50% and upwards, making it useless for any economical purpose. A sample analysed by the Government Analyst gave the following results:

Fixed Carbon	Gases	Ash	Moisture lost at 212
15.8	26.1	47.6	10.

And the analyst remarks:- "this is a carbonaceous shale rather than a lignite". The inert material matter and moisture form half of the entire substance and this proportion must be substantially reduced before any commercial value can be attained. It is of course possible that in some part or other of the deposit material of better quality may be met with. Some of that which is found has a tendency to be Tarry or oily. But so far the rest has been as stated above.

As these ligneous beds are of Tertiary age, true coal cannot be expected to occur in them. It is important to emphasise this, as I have repeatedly observed that there is a prevalent and apparently fixed idea that the lignite is an indication of coal and will if followed down, improve into coal. The only coal it can improve into is brown coal and that is all, which can be legitimately sought in this series of beds. To find the coal seams of our upper or lower measures, search must first be made for the sandstones, which enclose them.

Mr Coward showed me some yellow sandstone, which he had discovered many years ago about 1 1/2 mile up Saltwater Creek. It is not difficult to trace these for some distance down the creek. They lie flat and will, I believe, be found at no great depth below the beach on the Tamar. Wherever the eruptive diabase rock (bluestone or greenstone), which forms the ranges, does not descend to the water's edge, the fringing lignite beds will rest upon these older sandstones. At such places the river widens out, indicating that its channel has been excavated in the soft sandstone rock. Further north at Mr A. J. Evershed's shaft although the shore consists of diabase, it is very probable that this sandstone exists in the bed of the river. Large pieces of coal were found on the beach there, I am told, before the Cornwall and Nicholas mines were started, and are believed to have been derived from seams concealed by the river. Another supposition is that they came from passing vessels. Obviously one or the other theory may account for their presence.

South of this on Mr Taylor's land between Swan Bay and Little Saltwater Creeks some shafts and trenches are to be seen. The material thrown out of the former indicates that they have been sunk near the contact of the eruptive rock with the sandstone. The former rock descends to the flat land there, and that part of Mr Taylor's land, which lies, between Little Saltwater Creek and Saltwater Creek consists probably of sandstone, though I am afraid this will be cut out by the diabase not far below the surface.

The river frontage of Mr Traill's land south of Stony Creek on the west Tamar appears to consist of the diabase rock, but further west on his run this is replaced by sandstone, also seen on Mr Hunt's property, where the old freestone quarry is situate, which supplied stone for the Mechanic's Institute building and Maddock's building in Launceston.

This is a light grey, yellowish or greenish stone, quartzose and slightly micaceous in nature, somewhat similar in appearance to some of the stone worked in the midlands. It is about 13 chains from the river and the quarry has a face about 40 feet in height. The upper portions generally is rather soft, but the stone is somewhat harder in the bottom, although none of it is equal in quality to the best freestone at Ross.

This belt goes through beyond the main road and expands in width towards the north west. It bends south to the back of the diabase range. Consequently there is quite a considerable area of the freestone beds.

To give some guidance in exploration I may as well here tabulate in descending order the sequence of the strata bearing upon this subject.

5 Shingle of the Recent and late Tertiary periods	Capping the river bank near Medwin's, East Tamar
4 Lower Tertiary clays and sands with lignite	Fringing R. Tamar at Rosevears, Medwin's, Coward's etc
3 Mesozoic sandstone and shales with upper Coal seams	At Mt Nicholas etc, but not known as yet on R. Tamar.
2 Mesozoic sandstone and Freestone (Ross)	? At Coward's, Traill's, Hunt's etc
1 Permo Carboniferous:- Sandstones Upper Marine mudstones Lower Coal Measures, Mersey seams Lower Marine mudstone & Limestone Conglomerates	Not known on the R. Tamar Not known definitely on R. Tamar Middle Arm and York Town Middle Arm

The question, which in the absence of fossils cannot at present be settled, is whether these freestones are of Mesozoic or Permo-Carboniferous age. If the latter, they are likely to contain the seams of the lower Coal measures. If however they belong to the variegated sandstone group (No.2) in the above table; at the base of the Mesozoic, they would be too old for the Mt Nicholas measures and would have to be penetrated and passed through before reaching the lower coal measure sandstones (No.1). In this case the problem would be materially affected by their thickness.

Where fully developed, as at Knocklofty (Hobart) sandstones of this age show a thickness of upwards of 700 feet: but on the Tamar we do not know how near we are to the edge of the basin, where the beds may be expected to be much thinner.

I am here arguing on the assumption that the freestone is the equivalent of the Ross and Knocklofty strata, which I think is rather likely, though as yet unproved. On the other hand I have not visited the George Town deposits yet and it may be that these sandstones are a continuation of those.

The possibility of the neighbouring eruptive rock (diabase) cutting the sandstone out in depth must be borne in mind. This is almost sure to happen and from the powerful development of that rock on both sides of the Tamar, I am of opinion that bores would not go to an extreme depth without entering it.

Those interested in this coal question seem determined to set it at rest, so far as they are concerned, by boring with hand plant. Undeniably there are possibilities connected with it, and no more objection can be waged against it than against boring for coal in England through the New Red sandstone. The only thing is that possibly the task may prove too heavy for any but the diamond drill. To make sure of being able to go down to the desired depth and also to obtain cores of the beds passed through the diamond drill would be requisite. Less thorough prospecting down to 200 or 300 feet can be done with a hard boring plant. I would advise the parties engaged in this work to select the following sites for boring:-

**On the East Tamar.**

1. On Saltwater Creek near the end of the cultivated land on Mr Coward's property.
2. Between Saltwater and Little Saltwater Creeks on Mr Taylor's property.
3. On the Tamar bank near Mr Medwin's shaft: or near Mr Traill's shaft.

**On the West Tamar**

4. On Mr. Traill's property W. of Exeter Hotel.

From what has been said it will be seen that it is not a question of encouraging indications or otherwise, but rather one of possibilities and these can only be probed and either verified or disproved by the practical test of boring.

I have the honor to be,  
 Sir,  
 Your obedient Servant,  
 W.H. Twelvetrees.  
 Government Geologist.

W.H. Wallace Esq,  
 Secretary for mines,  
 Hobart