



THE CARBONIFEROUS DEPOSITS NEAR NEW TOWN.

THESE occur at the north-eastern slopes of the spurs or foot-hills descending from Mount Wellington, and therefore within the western parts of New Town.

As the question whether the Diamond Drill could be recommended to be beneficially employed in that locality formed the principal part of my instructions, an extensive surface examination has been made in order to ascertain, from the lithological and palæontological character of the carbonaceous strata and that of the contained seams of coal,* whether boring to greater depths could possibly give good results or otherwise.

It is deemed necessary, before going any further, to give a few particulars as to the principal coal-yielding mines, in order to be able to refer to same in the following portions of this Report.

Mr. Tim. Meredith's mine is worked by means of a horse-whim and a shaft 200 feet deep from the surface, in which the *second* seam of this district was intersected at 195 feet; the coal varies from 1 foot 3 inches to 2 feet 6 inches in thickness, and is subjected to numerous faults and *jumps*, rendering it sometimes difficult to recover the faulted or missing continuations of this seam. The main fault observes a bearing of South 67° East, and a nearly parallel fault close by, South 40° East. The Coal is of a better quality generally at this greater depth than any other, as it is disposed of at from twenty-two to twenty-five shillings per ton. Five men and a whim-boy are employed at this private mine.

The Enterprise Coal Mining Company (private) is the only one that employs steam winding machinery for working their mine. Their shaft is 110 feet in depth, and they are also working the second seam from the top, which averages twenty-two inches of useful Coal, the seam itself, with a parting of shale or 'clod,' being 2 feet 10 inches thick. In the direction of the dip of the Coal, or South 44° West, they have extended their workings to a distance of 200 yards, thus following the best description of the Coal; and their experience has been that, towards Hobart, as exemplified in the adjacent Jarvis and old Rosetta Mines—now abandoned—the seams become very disordered, and that towards the south rises considerably and gets much thinner and therefore unremunerative. In following that seam from the shaft along its dip, the subterranean water follows the workings as they incline in that direction, necessitating the employment of an underground force-pump to permit the coal-hewers to work. Fifteen to seventeen thousand gallons of water are raised daily from this mine, and the cost of cutting the coal is at the rate of eight shillings per ton, fetching twenty-two shillings in the market.

Mr. Ebenezer Sims's Coal Mine, adjoining the last named, is wrought by means of a horse-whim. The Coal occurs at 55 feet, and at 70 or 80 feet below that measuring 18 inches in thickness. From the upper seam, which is about 2 feet 6 inches thick, sixteen tons are raised by five miners per week on the average, which are sold on the "bank" at seventeen shillings per ton, and at

* The word Coal is continued throughout this Report, though, as it is explained, it is not really the Coal as known to consumers.

twenty-two shillings if delivered to consumers at their houses. The average dip is in the same direction as last, at the rate of six inches to the yard, indicating either a fault or other disturbance between this and the Enterprise Company's shafts. The Coal in its undulating dip has been found quite irregular, "clumpy," and of but little value if inclining to the south-east; there is also a considerable influx of water per diem, at the rate of from eighteen to twenty thousand gallons.

The region, in the near neighbourhood of the above described coal mines now working or abandoned, presents some remarkable features, directly due to the close vicinity of "vents" of volcanic rocks, and the actual protrusion of dense basaltic dykes through the formations carrying the Coal. The results of the penetration of the Coal measures by these volcanic vents and dykes appear to have led to and caused, in the first instance, the conversion of the pre-existent true Coal measures into carbonaceous shales and sandstones, and of the seams of Coal into "Anthracites."

As regards the former, they are of considerable thickness, as seen on the top of the New Town road near the old Tollgate; their lower series exhibit occasionally very thin veins of black carbon—non-bituminous. The embedded seams, belonging also to the series of converted Coals,—i.e., anthracites,—presents the usual appearance of black vitreous to half metallic and iridescent lustre, with a black streak; they are not easily ignited, but burn with an evolution of great heat, very little smoke and smell, leaving residues after burning almost the same in bulk as the raw mineral itself before combustion. They are non-bituminous, forming a natural stratified and compact coke as the result of contact with and in the vicinity of igneous rocks. With an admixture of other suitable fuel they are very useful for the production of quicklime, and for smelting raw iron ores for rough cast-iron.

I did not succeed in observing or collecting any palæontological specimens of any kind.

The New Town Anthracites, occurring in close contiguity to Mount Wellington, the extinct crater or centre of stupendous volcanic action, lose their character as such whenever they approach any of those more recent eruptive igneous rocks. It appears that from this great centre of pre-historic upheavals and convulsions, the adjacent or overlying strata was shattered and disrupted by fissures radiating from the former, and these clefts were filled with volcanic matter which converted not only the Coal measures and seams of Coal as described, but caused likewise many faults and other irregularities.

As a matter of fact the New Town carboniferous deposits may be regarded as the lower series or the remnants of coal measures that were altered or transmuted into non-bituminous deposits by the action of underlying volcanic rocks or of analogous dykes traversing the country. Under these circumstances the permanency of the present seams of anthracite depends on the more or less frequent intrusion of those dykes, and consequently, as the latter occur at uncertain and irregular intervals and places, the output of this mineral is also subjected to the same.

Some of the most instructive geological sections are disclosed in the cuttings along Stephen-street or road, and also at other places. At the former, not only are the shales, dipping from South 20° West to South 34° West, exposed to view, permitting a close examination, but also several dykes of black, compact basalt, which apparently pass gradually into the greenstones so prevalent at the Mount Wellington ranges; their structure is columnar and spherical to massive. About half a mile from the top of New Town Hill, on this road, a very massive dyke of basalt (phonolite?) nearly 200 feet thick, has been cut through, continuing to be visible at the surface towards New Town proper for over a quarter of a mile, gradually, however, diminishing in size; whilst in the opposite direction, or towards Mount Wellington, the two walls diverge considerably, as will be perceived from their bearings,—viz., the West wall of this dyke bears South 8° West, and the opposite, or East wall, South 6° East,—thus supporting the causation of radiating fissures from the chief centre of volcanic action,—viz., Mount Wellington.

At each side or wall of this dyke, the carbonaceous and, moderately so, calcareous sandstones and shales dip into or towards it, indicating a plutonic action rather than a volcanic, and "as if the stratified rocks had been dragged down by the subsidence of the material in the vent or dyke."*

As the principal Coal workings are located to the west and south-west of that dyke, it is not surprising to be told that, in the old Jarvis and Rosetta Coal Mines the seams were found to be very irregular, and to be subject to "faults" and "throws." In the working of Mr. Meredith's Coal Mine, immediately south of that dyke, the Coal has been found to "jump in and out," and one "fault" caused the vertical dislocation of the seam for a distance of sixteen feet.

It appears, however, that the central parts or portions of the seams hitherto wrought—i.e., the portions most remote from the transmuting and deteriorating influences by such dykes,—are more

* A. Geikies' Geology, p. 561.

regular, and produce a better class of Anthracite, though the best mineral, singularly enough, is obtained higher up the hill, and consequently at a greater depth, in Mr. Meredith's mine, if the higher prices previously quoted are a criterion to go by.

It would thus be seen that these Anthracites occur in seams like Coal; that this region has been subjected to very considerable disturbances and interferences, involving irregularities of no mean order, from volcanic action; that the Anthracites have been deprived of their properties as a combustible at the outcrop and for some distance below the surface, but that perish or disappear when approaching or when they are approached by those volcanic vents and dykes.

Although Anthracites occur infrequently elsewhere as alternating seams with true bituminous seams of Coal, in most instances they (the Anthracites) are found to form the *lowest* seams of Coal measures, whilst the higher or superincumbent seams comprise the more valuable or bituminous Coal; here, in all probability, there has been a very considerable amount of denudation, by means of which the real Coal itself has been removed.

The areas of really good, marketable Anthracite at or near New Town are therefore circumscribed in extent and irregularly distributed, so as to render the probability of fresh discoveries by means of the Diamond Drill very doubtful, and even, if found, the output would be limited by the same circumstances.

I would most respectfully submit that the Government should permit Coal-miners to enter upon the Crown Lands in that locality on certain conditions, and to be allowed to work any seam they may discover or know of, and to dispose of the Coal so raised on such terms as may be agreed upon between the representative of the Government on the one side and the Coal-miners on the other.

G. THUREAU, F.G.S.,
Inspector of Mines and Geological Surveyor.