

GENERAL REPORT, BY DR. HECTOR.

SIR,—  
Geological Survey Office, Wellington, 13th July, 1871.  
With the view of facilitating reference to the different coal seams in the Colony, which have been reported on by this department, I have the honor to enclose a schedule arranged according to the Province in which they occur, but from which schedule all analyses of coals not of practical importance have been omitted.

Where several analyses have been made of coals from the same district or locality, they are arranged according to their relative value, obtained by calculating their evaporative power, or the number of lbs. of boiling water which should be evaporated by one lb. of each kind of coal. In making this calculation, the same method has been adopted as that employed in similar investigations in other countries; and in the case of those coals that contain a large percentage of water, a due allowance has been made for the consumption of heat in the conversion of that water into steam.

The terms applied in the schedule to the different varieties of coal in New Zealand are to be used with the following definite meanings :—

- I. *Hydrous*. (Coal containing 10 to 20 per cent. of permanent water.)  
*a. Lignite*. Shows distinct woody structure, laminated, or shows that structure on desiccation; very absorbent of water.  
*b. Brown Coal*.—Rarely shows vegetable structure. Fracture irregular, conchoidal, with incipient lamination; colour, dark brown; lustre, feeble; cracks readily on exposure to the atmosphere, losing 5 to 10 per cent. of water which is not reabsorbed; burns slowly; contains resin in large masses.  
*c. Pitch Coal*.—Structure compact; fracture smooth, conchoidal; jointed in large angular pieces; colour brown or black; lustre waxy; does not desiccate on exposure, nor is it absorbent of water; burns freely, and contains resin disseminated throughout its mass.  
II. *Anhydrous*. (Coal containing less than 6 per cent. of water.)  
*a. Glnce Coal*.—Non-caking, massive, compact or friable; fracture, cuboidal, splintery; lustre glistening or metallic; structure obviously laminated; colour black; does not form a caking coke, but slightly adheres. This variety is brown coal altered by igneous rocks, and presents every intermediate stage from brown coal to an anthracite.  
*b. Semi-Bituminous Coal*.—Compact, with laminae of bright and dull coal alternately; fracture irregular; lustre moderate; cakes moderately, or is non-caking.  
*c. Bituminous Coal*.—Much jointed, homogeneous, tender, and friable, lustre pitch-like, glistening, often iridescent; colour black, with a purple hue; powder brownish; cakes strongly, the best varieties forming a vitreous coke, with brilliant metallic lustre.

The Under Secretary for Public Works, Wellington.  
I have, &c.,  
JAMES HECTOR.

SCHEDULE of the NEW ZEALAND COALS which have been reported on by the  
GEOLOGICAL SURVEY DEPARTMENT.  
AUCKLAND.

|                                                                                                                                     |             |     |     |      |       |       |       |                                        |     |
|-------------------------------------------------------------------------------------------------------------------------------------|-------------|-----|-----|------|-------|-------|-------|----------------------------------------|-----|
| <i>Kaiou River, Whangaroa Harbour</i> :—<br>A thick seam, in green sands; collected by H. Williams, Esq., no mine being yet opened. | Pitch Coal  | ... | ... | 6.29 | 49.60 | 14.40 | 1.00  | Non-caking                             | 48  |
| <i>Kawakawa Mine, Bay of Islands</i> :—<br>Seam 13 feet thick, in green sands; has been worked since 1865; contains much sulphur.   | Glance Coal | ... | ... | 7.44 | 57.20 | 4.60  | 2.20  | Non-caking, but occasionally adherent. | 25  |
|                                                                                                                                     |             |     |     | 7.20 | 55.40 | 4.40  | 1.70  |                                        | 27  |
|                                                                                                                                     |             |     |     | 7.12 | 54.80 | 4.00  | 3.80  |                                        | 46  |
|                                                                                                                                     |             |     |     | 6.14 | 47.30 | 3.20  | ...   |                                        | ... |
|                                                                                                                                     |             |     |     | 5.81 | 44.66 | 3.20  | 9.00  |                                        | 45b |
|                                                                                                                                     |             |     |     | 5.33 | 41.53 | 5.70  | 1.54  |                                        | 211 |
| Average composition                                                                                                                 | ...         | ... | ... | 6.51 | 50.15 | 4.18  | 3.04  | ...                                    | ... |
| <i>Walton's Mine, Whangarei Harbour</i> :—<br>A 5-foot seam, in green sands; mined during 1865-7; contains sulphur and much ash.    | Glance Coal | ... | ... | 5.11 | 47.90 | 9.20  | 7.00  | Non-caking                             | 51  |
|                                                                                                                                     |             |     |     | 4.96 | 38.80 | 7.20  | 12.80 | "                                      | 50  |
|                                                                                                                                     |             |     |     | 4.71 | 36.80 | 6.10  | 11.90 | "                                      | 19  |
| Average composition                                                                                                                 | ...         | ... | ... | 4.93 | 41.17 | 7.50  | 10.57 | ...                                    | ... |
| <i>Matakana</i> :—<br>Thin, irregular seam, in sandstone.                                                                           | Brown Coal  | ... | ... | 6.20 | 48.96 | 14.15 | .64   | Non-caking                             | 10  |
| <i>Drury</i> :—<br>A 6-foot seam; mined, 1862-5.                                                                                    | Brown Coal  | ... | ... | 5.18 | 41.10 | 13.90 | 3.30  | Non-caking                             | 9   |
| <i>Waikato River, Kupakupa Mine</i> :—<br>A 6 to 18-foot seam, in blue and yellow clays; largely mined.                             | ...         | ... | ... | 6.28 | 49.50 | 12.80 | 3.30  | Non-caking                             | 15  |
|                                                                                                                                     |             |     |     | 5.70 | 45.40 | 17.20 | 1.60  |                                        | 47  |
| Average composition                                                                                                                 | ...         | ... | ... | 5.99 | 47.45 | 15.00 | 2.45  | ...                                    | ... |