

8. NOTES ON THE GEOLOGY OF THE CHEVIOT DISTRICT.

(Summary of Report by J. HENDERSON.)*

Greywackes and argillites are the oldest rocks of the Cheviot district, where they constitute the hills between the township of Cheviot and the sea. Southward they are concealed by younger strata, but reappear at Port Robinson in the form of a fault-breccia. The oldest rocks overlying the greywackes are soft sandy claystones containing spherical concretions and darkened by carbonaceous matter. According to von Haast these are of Secondary age. Above them is a series of sandstones and mudstones that are in places calcareous and that close with a band of white limestone. The only fossil found in these rocks belongs to a living species, a fact indicating their Tertiary age. Von Haast's "*Scalaria* beds" overlie without angular unconformity, but there is some evidence to show that they were laid down on a denuded surface. Still younger, and undoubtedly unconformable with the "*Scalaria* beds," are thick layers of conglomerate which are evidently beach deposits. These ancient gravels are probably of the same age as the soft, horizontally bedded sandstone occurring at Port Robinson, and called by von Haast the *Turritella* beds.

At one or more horizons in the rocks described above are thin beds of phosphatic material similar to those described by P. G. Morgan† in last year's report as occurring at Kaikoura and Amuri Bluff. Though no workable deposit has yet been discovered, the occurrences are well worthy the attention of prospectors.

9. COAL AT MACLENNAN, CATLIN'S DISTRICT.

(By Professor JAMES PARK.)

In consequence of a communication announcing the discovery of coal at Maclennan made last February by Messrs. Ollerenshaw and Roxburgh, Professor James Park, of Otago University, was asked to inspect the locality. His report, dated 19th March, 1917, is as follows:—

"The seams of coal reported by Messrs. Ollerenshaw and Roxburgh as occurring near their property are seams of black carbonaceous shale containing streaks of bright bituminous coal. They crop out in the road-cutting on the road reserve lying between Sections 3 and 8, Block IX, Woodland Survey District, on the north side of the Maclennan River, about half a mile from Maclennan Railway-station.

"The rocks in which the carbonaceous beds occur are brown sandstones of Jurassic age. Their strike is about E.-W., and their dip north at angles varying from 25° to 30°.

"The lowest bed of black carbonaceous shale varies in thickness from 6 in. to 15 in. It is soft and friable, and contains only a small amount of intercalated coal. About 40 ft. above this seam there is another shaly seam from 2 ft. to 3 ft. or more in thickness, also consisting of black carbonaceous clays and irregular streaks and nests of black bituminous coal. The thickest band of bright coal is about 9 in. wide, but it is not continuous. Between these two seams and the upper one there are several thin streaks of black carbonaceous shale that vary in thickness from 1 in. to 3 in. or 4 in.

"These shale-seams are of no commercial value, and the prospect of their passing into seams of coal are so remote that I cannot recommend boring with a view of cutting them at a greater depth. Beds of coaly shale occur wherever Jurassic strata are found in Southland. During the past forty years considerable sums of money have been spent without success in prospecting them at Waikawa and elsewhere."

Analyses of two of the samples forwarded by Professor Park were made at the Dominion Laboratory, with the following results:—

	(A)	(B)
Fixed carbon	23.47	55.60
Volatile hydrocarbons	19.86	30.38
Water	6.32	3.42
Ash	50.35	10.60
	100.00	100.00
Sulphur (per cent.)	0.283	0.721

(A) Sample No. 2: Carbonaceous shale.

(B) Sample No. 3: Nests of coal in upper beds.

10. COAL OF WAITEWHENA DISTRICT, NORTH TARANAKI.

(Summary of Report by M. ONGLEY.)

Waitewhena district consists of a number of steep submature ridges cut from a thick series of almost horizontal beds of sandstone and mudstone by the southward flowing Waitewhena Stream and its tributaries. No underlying formation is exposed, and the sedimentary strata, striking 30° and dipping westward 3°, rise from stream-level (620 ft.) to 1,440 ft. above sea-level, exposing a thickness of almost 1,000 ft. Most of the beds are fine-grained sandstone and form steep faces, in which at many places seams of coal crop out, but it is only occasionally that the roof and floor are exposed, so that the full thickness of the seam is not readily ascertained. At one outcrop in a north-east branch of the Mangarohe Stream the coal is at least 18 ft. thick, at five other outcrops 15 ft., and at twenty-four more the thickness is at least 10 ft. North

* Dr. Henderson's full report is to be published in the *New Zealand Journal of Science and Technology*.

† Tenth Annual Report, N.Z. Geological Survey, C.—2B, 1916, pp. 23, 25.