

and volatile hydrocarbons the Retaruke coal resembles that from Taupiri; but the quantity of ash and sulphur is higher in the Retaruke than in the Taupiri coal. However, a certain amount of ash—below 8 per cent.—is not really a serious matter, and in some cases prevents decrepitation of coal by holding it together. Like the Mokau and Taupiri coals, the Retaruke coal is non-caking, and is essentially a household coal. Below are inserted, for purposes of comparison with Retaruke coals, the analyses of coals from Mokau and Taupiri.*

	(a.) Taupiri Coal-mine No. 1.	(b.) „ „ No. 2.	(c.) „ „ No. 3.	(d.) Mokau, Mangapapa.	(e.) No. 1 seam, Retaruke.	(f.) Lower seam, Coal Creek.	(g.) Upper seam, Coal Creek.	(h.) Lower seam, Dandy Gully.	(i.) Upper seam, Dandy Gully.
Fixed carbon	42.11	43.73	41.93	38.65	41.15	38.68	40.75	37.78	39.85
Volatile hydrocarbons ..	43.57	42.12	41.05	43.29	41.06	41.49	38.80	45.48	42.89
Water	12.24	11.72	14.22	11.34	12.07	13.26	12.98	10.82	12.01
Ash	2.08	2.43	2.80	6.72	5.72	6.57	7.47	5.92	5.25
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Sulphur	0.26	0.32	0.31	2.71	3.01	3.01	2.49	3.38	3.25
Calories per gram ..	6,079	6,129	5,649	5,987	5,721	5,478	5,359	5,964	5,871
British thermal units per pound	10,942	11,032	10,168	10,777	10,298	9,860	9,646	10,735	10,568
Evaporative power per pound, from calorimeter ..	11.34	11.44	10.54	11.22	10.67	10.20	9.99	11.12	10.95
Practical evaporative power (60 per cent. efficiency) ..	6.80	6.86	6.32	6.73	6.40	6.42	5.99	6.67	6.57

In the detailed descriptions given above of the various coal-outcrops, it may be noticed that the most promising exposures—those of highest quality, and sufficiently thick to be worth mining—are those in—

- (1.) The Lower Retaruke,
- (2.) Coal Creek,
- (3.) Dandy Gully.

The thickness of the seams diminishes and the quality becomes inferior to the rise towards the north-west, in the direction of the Main Trunk line. From Erua Station the seams on Coal Creek are about nine miles distant to the westward in an air line, but a branch line to the railway would probably be at least fifteen miles in length. It is thought that if the coal were lifted from a point near the outcrop to the level of the plain above, an easy grade could be found to the south of the Retaruke to the railway.

The lower of the two outcrops on the lower Retaruke is some eight miles distant in a direct line from the railway; and the upper, some eight miles also. Apparently the best way to get the coal out from these exposures would be by means of a steep incline to the watershed to the south of the Retaruke, and thence by an easily graded line of about twelve miles to the railway. The outcrops of coal in Dandy Gully are the nearest to the Main Trunk line of any of the workable deposits, being only about six miles west of Erua. From them an incline could easily be made up to the top of the steep spur adjoining, to the level of Cuff's ridge, whence a relatively easy grade of about seven or eight miles could, it is thought, be found to the railway. There would be an up grade for the first two or three miles, and then a slight down grade into Erua.

Now that coal-seams of workable thickness and of a quality suitable for household use, though not of value for steaming purposes, have been proven to exist in the Retaruke coalfield, it seems necessary, in the writer's opinion, that certain preliminary exploration should be carried out. Thus it would be desirable to put in prospecting drives on the outcrops in Coal Creek, Lower Retaruke, and in Dandy Gully, to ascertain the quality and the thickness of the seam or seams there exposed, away from the surface. The quality of the coal at the surface, picked free from stony bands, is in general fair, and, for reasons given before in section 1, it is thought it will be better, as far as ash and water are concerned, farther in. The thickness is not likely to alter greatly within short distances.

It is extremely difficult in the present very limited knowledge of the Retaruke coalfield to hazard even an opinion as to the amount of coal available. However, since a rough estimate of a portion of the field may be better than none, the following calculations are given: The area, which includes the seams in Coal Creek, the lower Retaruke, Paddy's Creek, Sandy Creek, Dandy Gully, and Jackson's Creek, covers an area of about 810 acres. Of this, in probably 80 acres the coal is denuded in the stream-valleys, leaving a balance of 730 acres, or 31,798,800 sq. ft. The coal-seams in the above-mentioned localities average at least 6 ft. in thickness, but, on the assumption that some of this material is too stony to mine, it will be well to allow for a thickness of only 3 ft. This third dimension will give 95,396,400 cub. ft. of coal. Supposing that a ton (2,240 lb.) of Retaruke coal occupies, roughly, some 28 cub. ft., then some 3,407,000 tons of coal are available within the area given.† This amount is not likely to be less, and may be more. It is thought that the grade of this amount of coal need not exceed the 8-per-cent. limit of ash, or the 3-per-cent. limit of sulphur.

* All analyses in this report are by Dr. J. S. MacLaurin, Dominion Analyst, and staff. Analyses a, b, c, and d quoted above are from "Report on Analyses of New Zealand Coals," 1906, p. 8.

† The specific gravity of Retaruke coal, even after allowing for porosity, &c., is probably higher than 1.25, as assumed in this calculation. A sample from Dandy Gully had a specific gravity of 1.358.