

There would be no difficulty in constructing a tramway from the mouth of the tunnel to the Kanieri Township. Its length would be about nine miles, and the cost of construction £300 per mile, according to Mr. O'Connor's estimate.

Together with report and plans, a box containing specimens of various strata will be forwarded to you. The numbers I have given these specimens correspond with the numbers on the plan, indicating the localities from whence they were taken. To facilitate classification I affix the following list:—

- Specimens marked 1, 1a, 2, to 41, came out of prospectors' trench,
- Specimens marked 42 to 46 came out of lower shaft.
- Specimens marked 47 and 48 came out of upper shaft.
- Specimens marked 49 came out of bore in Purnell's Creek.
- Specimens marked 50 came out of upper shaft.
- Specimens marked A and B came out of Butcher's Creek coal seam.
- Specimens marked C came out of upper shaft.
- Specimens marked D came out of lower shaft.

Many of the specimens have suffered during carriage, more especially the coals, which are all of a very friable nature.

I have &c.,

GERHARD MUELLER,
Chief Surveyor, Westland.

The Hon. the Minister for Public Works,
Middle Island, N.Z.

O T A G O .

Dr. FLECTOR to the UNDER SECRETARY, Public Works.

(No. 72.)

SIR,—

Geological Survey Office, Wellington, 9th July, 1872.

In order to render more complete the reports on the coal mines of the Colony, which have been prepared for the information of the Minister for Public Works, I have the honor to forward a short account of coal fields which will be rendered available by the Otago South Trunk Railway from Dunedin to the Clutha River.

I should explain that much of this information has already been published in papers presented to the Provincial Government of Otago, 1864, and in other official reports.

The coal deposits referred to may be described as in two distinct areas,—

1. The Clutha and Tokomairiro Field.
2. The Green Island and Saddle Hill Field.

The first of these occupies an area of twenty square miles on the East Coast, north of the Clutha River. The formation consists of conglomerates, sandstones, and clay shales, with several seams of coal. These strata form a range of hills, 700 feet high, between the Kaitangata Lake and the sea coast, and dropping in altitude to the north, again rise and flank the south-east side of the Mount Misery range, which is composed of the upper schistose rocks. The chief coal seams are at the south end of the above area, and a very clear section of this part of the formation is exposed in the sea cliff between the north end of the sand spit of the Clutha River and Coal Point, a distance of nearly three miles.

This cliff bounds a terrace 70 feet above the sea level, and extending for half a mile back to the base of the hills. The coal measures are exposed in the lower 10 to 20 feet of this cliff, and also in the bottom of ravines that intersect the terrace, the upper part of which is composed of horizontally stratified ferruginous sands, clays, and gravel beds, finely laminated and false bedded. No fossils were seen in this deposit, but it contained nodules of impure siliceous ironstone, that yield traces of phosphoric acid. These sand beds, which are probably of the same age as the gold drifts of the interior, rest on a very uneven surface of the coal measures which form the lower part of the cliff, consisting of alternating beds of conglomerate, sandstone, shale, and fire-clay, all containing more or less carbonaceous matter, and having a general dip of 7° to 12° to the east, but at several places faulted, so that for a short distance the dip is in the opposite direction.

Section I. shows the manner in which the strata are exposed in the cliff, the following being an estimate of the thickness of the various beds:—

- A. Ferruginous sands and clays in horizontal beds, 40 feet to 50 feet thick.
- B. Coal measures, dip, E.N.E.

	Feet.		Feet.
1. Gravel grit	6	12. Brown sandstone	10
2. Sandstone	30	13. Impure coal and fine clay	10
3. Laminated clay, with dicotyledonous leaves	30	14. Soft blue clay, with ironstone septaria	6
4. Double fault, filled with clay of a bright blue colour (1 foot wide)		15. Quartzose grit	
5. False-bedded sandstones	10	(The dip changes to E.S.E.)	
6. Quartzose gravel	23	16. Gravel grit	10
7. COAL (A) (Coal Point seam)	20	17. Mullock	4
8. Carbonaceous shale	?	18. Fire-clay	4
9. Grit	?	19. Shale	6
(Here the dip changes to S.W., with an obscure fault.)		20. COAL	6
10. Clay slate	15	21. Fire-clay	3
11. Quartz grit	2	22. Gravel, with carbonaceous streaks	6
		23. Impure fire-clay	4
		24. Finely-laminated sandy clays, with carbonaceous streaks	16