1875.

NEW ZEALAND.

TOPOGRAPHICAL SURVEY OF BULLER COAL FIELD,

(REPORT ON).

Laid upon the Table of the House of Representatives by the Hon. the Minister for Public Works.

No. 1.

Mr. W. M. Cooper to the Engineer-in-Chief.

I.—Work Done.

1. During the past season, the survey has been extended southward from the point previously attained, to the summit of Mount Rochfort and eastward to Mount William Ridge, whilst westward it has been continued as far as the plateau country extends, leaving the sea face, the whole distance from Westport to Granity Creek, yet to be surveyed. The latter instalment was left over for work during the winter, when it would be impracticable to carry on operations on the high ground, and is now being proceeded with as rapidly as weather will permit.

2. The survey has been carried on in the same manner as described in my former General Report, dated 15th June, 1874, with the addition of a major triangulation, and an exploration for coal.

3. The major triangulation consists so far of six triangles of from two to six miles in the side, the bearings being taken with a 7-inch transit theodolite. The trig. stations are built in a substantial manner of stones, except in one instance where it was necessary to use sods instead, forming a circular structure 4 feet high and 7 feet in diameter on top, in which is imbedded a strong iron peg 5 feet 6 inches long, with two cross bars at the foot, and a 4-inch ring bolted through the upper part to receive a pole. The triangulation is founded on a base line two and a half miles long, for the site of which a convenient place was found in a straight run in the first section of the Westport and Ngakawau Railway, thereby avoiding the expense which has usually to be incurred in preparing the ground.

4. The coal exploration has been carried on by Mr. R. B. Denniston with the assistance of one man, and has been extended over an area about coterminous with the whole of my survey on the coal fields. This work consists of carefully going over the ground after survey, and making as thorough an examination of the strata, their nature, dip, breaks, &c., and particularly the outcrops of coal, as can be done without excavation, with the view of being thereby enabled to mark upon the map the different areas of coal, their probable extent, thickness, and quality. I forwarded at the close of last year a report of his operations to date, and a map showing the results in that part of the coal field which he had then gone over, being the portion included in sheet 9 of the lithograph map. I now enclose his report for the period from 1st January to 30th June, 1875, and the results of his operations during this period are shown in tracings made from the field maps by Mr. Cox, when in Westport a few months ago. I do not therefore think it necessary to make a map of them to accompany the report.

5. The amount and list of work done by me during the period embraced in this report are as follow:—Lines traversed, 95 miles; bush lines cut, 19 miles; number of major trigonometrical stations erected, 8; minor trigonometrical stations, 205; numbered traverse pegs, about 1,000; and aneroid observations, 1,970. The area of ground surveyed is about thirty-three square miles, say 21,000 acres; and the total cost, including an estimated sum for the plotting not yet completed, and the cost of some work done by me on the Mount Rochfort Plateau in November and December, 1873, will be about £1,400, being at the rate of 1s. 4d. per acre.

6. The amount and cost of Mr. Denniston's work for the same period are as follow:—Area explored and mapped, about forty-two square miles, say 27,000 acres; and the cost is about £420, giving an average of 3½d. per acre.

7. The total average cost of the work is therefore 1s. 7½d. per acre; and, taking into account the mountainous and broken nature of the country gone over, and the minuteness of detail with which the survey has been carried out, I think the figure must be considered a low one.

8. *Orikaka Saddle.*—I have made another observation of the height of the saddle between the Orikaka and a tributary of the Ngakawau, alluded to in my report of 15th June, 1874, and make the height, by the mean of the two observations, 1,318 feet above sea level. I was unable to spare time to go through to the Mokihinui, but, from the observations I made, my former good impressions of the country to the north and east, both as to coal-producing probabilities and the quality and easy lie of the land, were confirmed. (See my recommendation in paragraph 11 of this Report.) To the south and south-east, on the other hand, the country becomes very rugged, and inferior I think in both these respects, as well as difficult of access and densely timbered.

II.—Future Operations.

9. After the work on the sea face alluded to in paragraph 1 is finished, which will probably occupy from two to three months, the portions of the coal field which I think merit the next attention are, Cascade Creek, head of Orikaka, and Mokihinui.

10. *Cascade Creek* rises between the summits of Mounts William and Rochfort, and pursues a southerly course to the River Buller, into which it falls about ten miles above Westport. Several good-looking outcrops of coal have been found in the upper parts of the valley near the level of the creek; but of the extent of the seam or seams no definite opinion can be formed without spending a considerable time in exploring, the valley being over 1,000 feet deep, and the sides steep, much furrowed, and thickly timbered. The amount of time which it would be worth expending upon its exploration would depend upon the results obtained, and could only be judged as the work progressed. Mr. Denniston, who has spent about a week in a cursory examination, is of opinion that to explore the valley thoroughly would occupy three months. The only outlet for the coal when raised would be by tram or railway down the creek and alongside the north bank of the Buller to Westport, a distance of say fourteen miles, six of which, at the Westport end, being of easy construction, and the remainder over sideling ground more or less steep.

11. *Head of Orikaka.*—Near the divide spoken of in paragraph 8, an outcrop of coal was found of good quality, superior hardness, and slight dip, having the appearance of being steady, and of considerable extent (*vide* Mr. Denniston's General Report, 30th June, 1875, p. 19). The country hereabouts is flatter and much less broken than any ground I have yet been over; on the other hand it would be somewhat troublesome and expensive carrying stores so far inland; but on the whole I think it is desirable to extend the survey in this direction, and proceed as far as good indications of coal are found. The adoption of this course would, moreover, afford a favourable opportunity of carrying out the suggestion made by Mr. Denniston in the last paragraph of his report, that a bore should be put down near the crossing of the main track and Pouri Creek, in order to decide whether or not there is in that part of the coal field a finer seam, of the existence of which there is some indication. In that suggestion I concur, as my impression has always been that workable coal would be found here, and the map of it is at present a blank as far as this is concerned.

12. *Mokihinui.*—A mine was opened here last year near the bank of the river, and about three miles from the mouth, and the results were encouraging, but nothing of consequence has been done for the last six months. Good samples have been found cropping out at various points, from which tramways could be laid down without any unusual expense to the mouth of the river, a distance of from three to six miles. As the river has a good entrance, and is generally available for vessels drawing eight feet of water, a moderate trade could be carried on in the meantime; and the Westport and Ngakawau Railway could be ultimately extended to the Mokihinui, at a moderate cost, if the results of the mining operations there were found to be such as warranted the outlay. I should recommend that the block of country intervening between the Ngakawau and the Mokihinui, and extending say five or six miles inland, should be surveyed as far as the results obtained appeared to warrant. It might be desirable also to extend the survey for same distance north of the Mokihinui. As, however, the whole of this country is covered with bush, the cost would be much greater than that of the work I have already done.

13. If the three localities I have named were surveyed, the survey would then embrace all those portions of the coal field which have as yet been prospected with any success.

III.—Mining Operations.

14. Of all the large number of lease and license holders on the Buller Coal Field, only three have to my knowledge done anything towards prospecting for or developing the coal within their areas since I made my last general report on this subject, dated 31st December, 1874—viz., Roche, Mullholland, and Overhagen.

15. Roche and party, who held a prospecting license on the south side of the Waimangaroa near its outlet from the Gorge, have put in a drive 200 feet long into the seam which cropped out upon their ground near the bank of the river. The coal, which was at first mere dust, has improved somewhat as they have driven into the hill; but though it is, I believe, good enough for use on the spot, it is still too soft for export. They are now about, I am informed, to test the quality of another outcrop, a little higher up the hill, and they express the hope that this will prove a harder coal.

16. Mullholland (or Sims and party) hold a prospecting license on the north bank of the river, immediately opposite Roche's. It is on their ground that the drive put in under Dr. Hector's directions, three years ago, is situated; and to the remarks made in my report of 31st December I have only to add that Sims and party have lately commenced to put in a fresh drive somewhat higher up the hill, the result of which will not probably be known for a month or two (*vide* Mr. Denniston's Report for June, 1875, last paragraph).

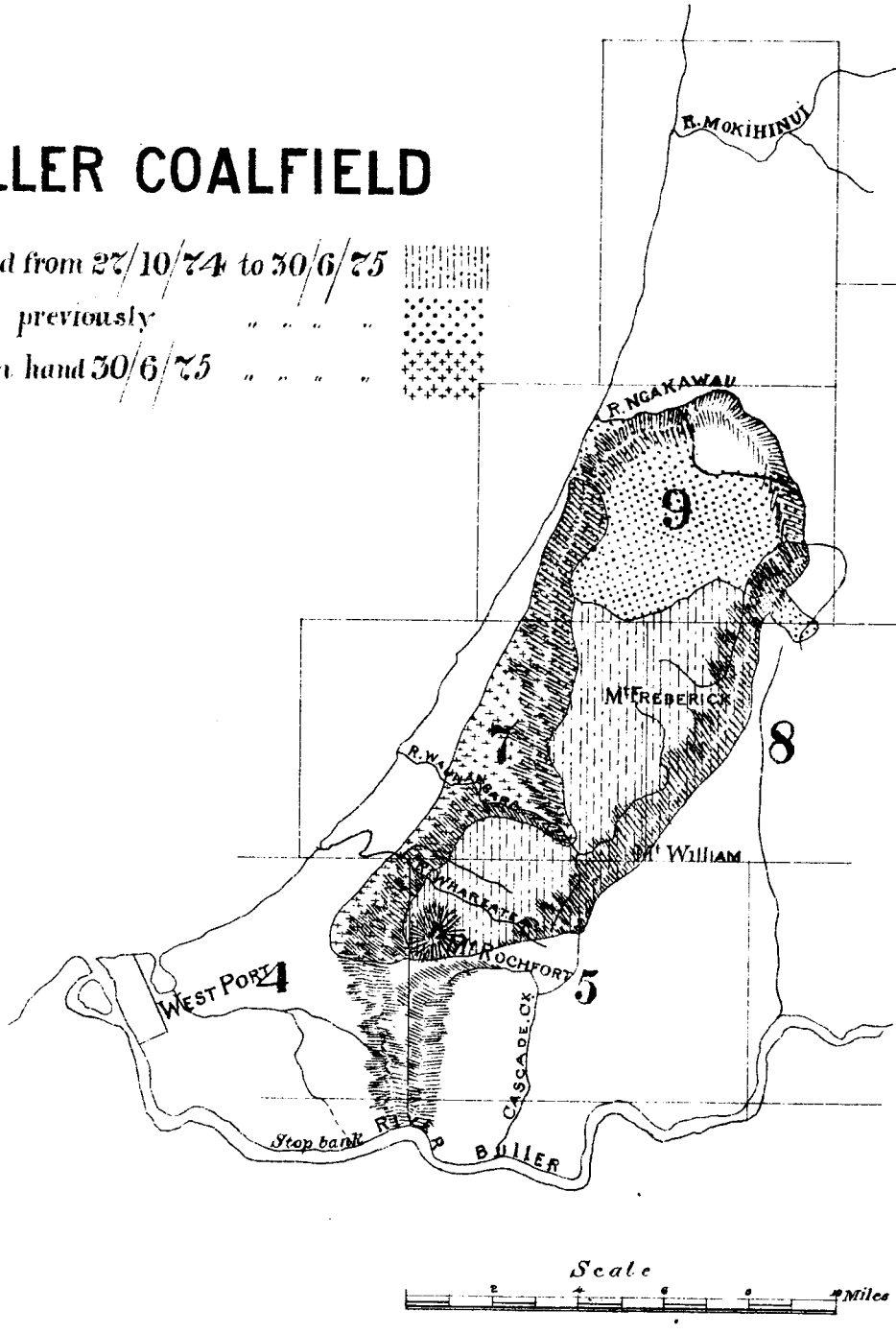
17. Overhagen and party, Cascade Creek. Since my report of 31st December, they have had a surveyor upon the ground and made their selection for lease. Overhagen has again proceeded to Melbourne with plans and other information on the capabilities of the ground, and has not yet returned.

BULLER COALFIELD

Portion Surveyed from 27/10/74 to 30/6/75

previously " " " "

In hand 30/6/75 " " " "



I am informed, however, that there is a fair prospect of capital to develop the mine being forthcoming in that quarter.

18. As it is still a matter of doubt whether any of the low birl coal, though possessing other excellent qualities, will be found sufficiently hard for export purposes, and the high birl coal, though good in this respect, will require works of considerable magnitude and ingenuity to bring it to the railway line, it seems to be of the utmost importance that no time should be lost in at once proceeding to develop the vast stores of mineral wealth on the plateaux of Mounts Rochfort and Frederick. Unless a great change takes place shortly in the action of the various parties amongst whom the whole of the known coaliferous ground on this coal field is at present divided, it will be many years before the object for which the railway and harbour works have been undertaken is attained.

I enclose map showing portions surveyed and other particulars.

W. M. Cooper,
Topographical Surveyor.

Westport, 30th June, 1875.

No. 2.

Mr. Denniston to the Engineer-in-Chief.

BULLER COAL FIELD.

GENERAL REPORT OF COAL EXPLORATIONS ON MOUNTS FREDERICK, WILLIAM, AND ROCHFORT, FROM JANUARY TILL JUNE, 1875.

Since my last general report I have continued my explorations from southern boundary of Ngakawau section, viz. T. 20, working my way south and east on to the summit and along the eastern slopes of Mount Frederick, likewise along the western base, slopes, and top of Mount William ridge, on to summit of same mount, continuing my work south from summit of Frederick and William up the N.N.E. and N.W. slopes of Rochfort till reaching summit of same. The position of the crops and sections found, together with the various breaks and faults throughout the areas and levels, will be found marked on the map together with their heights, the result of my labours being as follows:—

Area 5.

The greater portion of this area, having been previously reported upon in Ngakawau section, calls for few further remarks more than there stated, the only coal line found being a few crops marked on map, a little to the westward of station T.8, in face of fault 10, showing coal of a thickness of from 7, 8, 10, and 12 feet, dip N.E. to E. 8°, for most part faulted, attributable to its closeness to face of fault, bearing every appearance of being the crop of coal held in western part of this area (see Ngakawau report, area 5), the surface grits being even and regular. On the S.W. or upper corner of this area the surface grits appear much shaken, not broken, throwing open many backs or breaks in the stone, yet having appearance of holding coal in a somewhat similar proportion to that reported upon in high level A.

Area 8.

In this area I have failed to trace coal of any exent, the only coal traceable being sections marked in face of break 15, showing coal 4 feet thick, dip N.E. 10°, bearing appearance of being crushed. Also in face of break close to station 8, four sections are marked showing thus: Coal, 3, 4, 6, and 8 feet thick, dip N.E. 12°. A small part of this area I have marked as containing coal, the centre portion being much disturbed and broken, while on the northern and eastern side it contains numerous surface outcrops of coal, shale and blaze. Evidently, from their general appearance of dip, together with surface indications, they are the surface outcrops of coal contained in area 517, Ngakawau section; the surface to the eastward being cut up into small hillocks or mounds, surrounded by creeks, showing coal of a thickness of from 3, 4, 5, and 6 inches, the dip of the coal here being very irregular and broken, the coal itself inferior in quality. On the eastern side face of fault 9, close to junction of Fly Creek with Ngakawau, a section is got showing a face of coal 6 feet thick, dip E. 10°, which crops to surface about 15 chains to westward of fault. I have, as may be noticed, marked here a small area as holding coal—that is, so far as surface indications bear me out in doing so.

High Level A (*Frederick*).—Bounded by fault 10 on the north, No. 11 on the east, main break of mount on the south, and sea fault on the west. Throughout this part of the field, between break 16 and sea fault, I have been successful in tracing the continuance of the coal south from area 6, which appears to run through this part with great solidity and evenness, lying at easy angles, which, together with the numerous creeks (being gorgy) having worn down the top grits on to the coal, has facilitated much in the prospecting of this part. On this level going south, I have noticed the putting on of a second (upper) through thin seam of coal which has been noticed to continue in other lower levels. The various sections of coal found show thus:—

Section No. 13. Coal in bed of small creek, top only noticed. Dip S.E. 5°.

Section No. 7.

	Ft.	in.
Surface, fine Quartz Grits	20	0
Soft Sandstone	10	0
Blaze	6	0
Coal	25	0
Shale Blaze	4	0
	65	0

Dip E. to N.E. 15°, resting upon hard quartz grits

		Ft.	in.
Section No. 8.	Coal (6 in.) and Blaze (6 in.)	1	0
	Soft Sandstone	2	0
	Fine Grits	5	0
	Soft Sandstone	6	0
	Blaze	3	0
	Coal	12	0
	Shale Blaze	3	0
		32	0

Dip N.E. 12°, resting upon hard quartz grits.

		Ft.	in.
Section No. 9.	Surface, fine Quartz Grit	20	0
	Soft Sandstone	10	0
	Blaze	3	0
	Coal	6	0
	Shale Blaze	14	0
		53	0

Dip W. 5°, resting upon hard quartz grits. Coal here appears crushed.

		Ft.	in.
Sections Nos. 10, 11, and 12.	Coal and Blaze	1	0
	Soft Sandstone	3	0
	Fine Grits	10	0
	Soft red Sandstone, with shaly partings	6	0
	Blaze	3	0
	Coal	25	0
	Blaze	4	0
		52	0

Dip. S.E. 10°, resting upon hard quartz grits.

		Ft.	in.
Section No. 18.	Surface, fine Quartz Grits	5	0
	Soft red Sandstone, with shaly partings	5	0
	Blaze	0	6
	Coal	1	0
	Shale Blaze	0	6
	Soft Sandstone	25	0
	Blaze	4	0
	Coal	37	0
	Shale Blaze	5	0
		83	0

Dip S. to S.E. 8°, resting upon coarse hard grits.

Section No. 20. No section got; 10 feet coal shown and not bottomed.

		Ft.	in.
Section No. 23.	Coal	0	6
	Shale Blaze	1	0
	Soft Sandstone	2	6
	Fine Quartz Grits	10	0
	Soft Sandstone	5	0
	Blaze	2	0
	Coal	32	0
	Blaze	4	0
		57	0

Sections 24 and 25. Coal 5 and 8 feet thick shown; no sections obtained. Shows to hold a good thickness.

The coal, as may be seen from sections above given, holds a good thickness and appears to be a coal of good quality, though soft and friable in nature, as may be seen from samples forwarded.

From Station T. 20 south to T. 11, the body of coal from break 16 appears to pass through the mount steady, till gaining face of sea fault a few chains south of T. 11, where a face of coal 7 feet thick is noticeable, though crushed, to the south; and past T. 18 the coal is cut out from face of sea fault by a belt of granite, which continues till gaining near station T. 13. The lower part of this level, to the east of break 16, as may be observed from map, holds only throughout a few detached sections and island mounds of coal, which show thus:—

No. 1.	Coal	8 feet.
No. 2.	Coal	5 „
No. 3.	Coal. Top of seam only noticeable.	
No. 4.	Coal	25 „
No. 5.	Coal	25 „
No. 6.	Coal	25 „

with a S. to S.E. dip 12°, resting upon hard quartz grits. The coal here has the appearance of being much crushed and broken. Further to the south than those above given, four island mounds are marked, showing, as nearly as could be observed, holding coal 5 feet throughout. This coal, as seen from the many exposed sections around the mounds, is of itself troubled, and being very wavy, thinning and thickening at short intervals, in many places the floor and roof all but meeting. To the south of break 14, and west under break 16, four islands mounds are marked, showing sections of coal thus:—

		Ft.	in.
Section No. 16.	Grits, fine	10	0
	Soft Sandstone	5	0
	Blaze	4	0
	Coal	12	0
	Shale Blaze	6	0
		37	0

Dip S. 8°, resting upon hard quartz grits.

		Ft.	in.
Section No. 19.	Fine Grits	8	0
	Soft Sandstone	3	0
	Blaze	3	0
	Coal	8	0
	Shale Blaze	4	0
		27	0

Dip S. 10°, resting upon hard quartz grits.

		Ft.	in.
	Fine Grits	3	0
	Soft Sandstone	2	0
	Blaze	3	0
	Coal	8	0
	Shale Blaze	4	0
		20	0

Dip S. 10°, resting upon hard quartz grits.

Small section shows on face of fault 11, near station L. 43, showing a thickness of coal 9 feet, holding same thickness throughout the section. The coal in the sections above given, Nos. 16, 19, and 21, appears to be much crushed, the coal to the eastward of the sections showing good in quality, but faulting towards westward break 16. The remaining part of the area, not filled in as containing coal, holds on the surface the same hard quartz grits as shown in sections above, floor of coal bearing to appearance that of coal having been denuded from off same, leaving the preserved sections above given; those grits (bottoms), for most part throughout, hold great solidity and thickness. I have traversed up and down the various creeks in this level; and, notwithstanding their being gorgy and worn down well into the grits, I have failed to trace any indications of a lower seam, but have considerable doubt but that there does exist a lower seam here, it no doubt being prevented from cropping to westward by granite belt previously mentioned on sea fault.

Mid Levels A and B (Frederick).—On these levels I have not been so successful in tracing coal, the surface here holding hard quartz grits, and bearing the same appearance as previously stated regarding eastern part of High Level A—namely, that the coal has been denuded off same. The surface in this level is very much disturbed, the stone itself holding many dips at short distances, together with many small breaks. Throughout this level many small creeks are got, they being gorgy with precipitous sides worn down into the measures 50, 60, 70, and 80 feet. In those I have failed to trace any indications of a lower seam; but, as mentioned regarding High Level A, have considerable doubts, the proving of same being beyond the reach of my limited surface explorations.

Mid Level C (Frederick).—In this level the same indications present themselves as in the former levels A and B, with one exception—the finding of a small section of coal (preserved) on or near Station L. 64, showing,—

	Ft.	in.
Fine Grit	10	0
Soft Sandstone	6	0
Blaze	3	0
Coal	6	0
Shale Blaze	4	0
	29	0

Dip, E. 10°, resting upon hard quartz grits. The coal presents a shaken appearance to the south of this section. In face of main east break Webb's Creek is struck, and being well worn down into grits, north side. In this when traversed we failed to trace any indications of a lower seam, but hold the same doubts in this as mentioned in former levels, it being an area of denudation.

Low Level A (Frederick).—On those levels I have not been successful in tracing coal in quantity; the surface here—that is, in area of ground confined by fault 12 on the west, fault 9 on the east, Fly Creek on the north, and main east break on the south—being composed for most part of hard quartz

grits, showing in places many preserved sections of top grits, which lie all but on edge. From careful prospecting those preserved patches do not appear to hold much coal cropping to surface, only with one exception under face of fault 12 is found—

	Ft.	in.
Coal	1	0
Blaze	2	0
	3	0

dip, E. 12°; the measures around this having appearance of disturbance. In traversing down left-hand branch Fly Creek, which gorges with wall perpendicular 60, 80, and 100 feet, I got several good sections, showing in places top measures disturbed, but failed to trace any coal, which still leaves a doubt here also as to its existence, which, if it does exist here, is beyond my limited explorations. In the traversing of Whirlwind Creek and Waimangaroa good sections are obtained, but in all showing similar to those in Fly Creek.

Low Levels B and C (Frederick).—To the eastward of break 9 the measures are broken through by a slate belt, composed of small spires and hillocks holding slate on surface, extending from near face of break east down to near Cypress Creek, and north till gaining peg 10 of Happy Valley traverse line, extending south past L. 62 till reaching peg 11, Waimangaroa traverse, near face of break 9.

Along the face of break and out east on to slate I have prospected diligently, but have not been successful in tracing crops of any coal. On the eastern slopes of those slate spires facing Happy Valley small pieces of grits and coal are traceable, till reaching bed of Happy Valley, where slates appear to dip under, and measures again make. A small basin of coal is here struck showing crops as under:—

		Ft.	in.
Section No. 26.	Fine Grits	12	0
	Soft Sandstone	2	0
	Blaze	1	0
	Coal	12	0
	Shale Blaze	2	0
		29	0

Dip W. 10°, resting upon soft white sandstone.

Section No. 34. Coal ... ... 3 feet shown.

In this section no particulars could be obtained.

Section No. 30. Coal ... ... 12 feet.

Dip W. 12°, resting upon shale. No further section here could be obtained.

Section No. 42. Coal ... ... 3 feet, top seam.

Dip S. to S.W. 10°, resting upon soft sandstone.

		Ft.	in.
Section No. 42½.	Soft Sandstone	2	0
	Blaze	2	0
	Coal, top seam	3	0
		7	0

Dip S. 12°, resting upon soft sandstone.

This coal is of excellent quality, being in itself much harder than that seen on upper height Mount Frederick. From the general appearance of the measures around they bear that of being thrown, together with the dip of slate spires on the west being east, the dip of coals west, and crops east towards and up Mount William ridge, I would be of opinion that this coal has slipped or been thrown from the ridge. The valley is crossed by a cross bar of slate to south, near pegs 4 and 3, throwing south end of coal area with a southerly dip.

High Level B (Frederick).—This height, as may be here observed from the upper height, summit of Mount Frederick, which holds an area breasted on the east by high level fault, and on the west by sea fault. On the face of these faults numerous sections of coal are obtained on the four sides of the area, while one section in the centre has also been obtained (No. 109), all holding coal of considerable thickness. I have therefore, as may be observed, marked this area as holding such, for most part throughout its entire extent. The sections found in same show thus:—

		Ft.	in.
Section No. 35. Western face.	Surface, fine Quartz Grist	8	0
	Soft Sandstone, with shaly partings	10	0
	Blaze	4	0
	Coal	18	0
	Shale Blaze...	6	0
	Soft grey Stone	10	0
		56	0

Dip E. 10°, resting upon hard grits.

Section No. 36. Western Face.

	Ft.	in.
Surface, fine Grits	30	0
Soft brown to yellow Sandstone	20	0
Soft Sandstone, with coaly partings	4	0
Blaze	3	0
Coal	18	0
Shale Blaze	5	0
Soft brown Sandstone	10	0
Coarse Quartz Grits	15	0
Slate		
	105	0

Dip E. 10°, resting upon slates.

Section No. 37. Western Face.

	Ft.	in.
Surface, fine Grits	20	0
Soft brown to yellow Sandstone	15	0
Soft Stone, with coaly partings	4	0
Blaze	4	0
Coal	14	0
Soft dark Sandstone	10	0
Coarse Grits	12	0
Slates		
	79	0

Dip E. 10°, resting upon slates.

Section No. 38. Western Face.

	Ft.	in.
Surface, fine Grits	10	0
Soft brown to yellow Sandstone	5	0
Soft Stone, with coaly partings	3	0
Blaze	2	0
Coal	8	0
Soft dark Stone	6	0
Coarse Grits	6	0
	40	0

Dip S.E. 12°, resting upon slates.

Section No. 39. Western Face.

	Ft.	in.
Surface, Fine Grits	12	0
Soft Yellow Sandstone	10	0
Blaze	3	0
Coal	6	0
Shale Blaze...	1	0
Coarse Grits	6	0
	38	0

Dip S.E. 12°, resting upon slate.

Section No. 109. Centre of area.

	Ft.	in.
Fine Grits	20	0
Soft Sandstone	10	0
Coal	20	0
	50	0

Dip E. to S.E. 14°, resting upon hard, troubled grits.

Section No. 110. East Face.

	Ft.	in.
Surface, Fine Grits	25	0
Soft Sandstone	20	0
Blaze	4	0
Coal	26	0
Shale Blaze...	2	0
	77	0

Dip E. 14°, resting upon hard quartz grits.

The remaining sections obtained along the east face north from section No. 110 above given continue to hold coal of a uniform thickness to those already given on western slope.

The coal, as may be observed from the sections above given, holds a considerable thickness to the north end of the area T.13, while upon going south along the west face the coal thins, with lessening indications showing in grits and coal, this being attributable to the existence of a slate belt noticeable under the measures, near station T.13, which upon going south along face lessens the measures, till, reaching well south of the area, it ultimately breaks through same entirely. The surface throughout this part is comparatively flat and destitute of soil, showing grits holding numerous back breaks in stone, and in some places the grits much broken. The coal is of a soft and friable description, and, as far as I can judge, would be a coal highly suitable for steam purposes.

Lower Level D (*Frederick*).—This level, as may be observed, is confined to the low country with main east break on the north, on the west by fault, on the east slopes of Frederick, extending along to and joining mid-level break, also along the southern end of high-level fault, on the south by S.W. shoulder of Mount William, and east by Mount William ridge, extending north along its base and western slopes, till gaining the main east break. This area forms itself into a trough or basin, holding, as may be seen from the sections following, thick faces of coal, two seams in all, throughout.

		Ft.	in.
Section No. 31.	Coal, without roof	0	6
	Blaze	4	0
	Total	4	6

Dip S. to S.E. 10°, resting upon quartz grits. Here no roof could be got before making surface, this section resembling much in appearance that of a crop, or one of them, of the basin.

		Ft.	in.
Section No. 32.	Soft Sandstone, yellow	20	0
	Blaze	2	0
	Coal, upper seam	4	0
	Shale Blaze	2	0
		28	0

Dip S.E. 10°, resting upon hard quartz grits.

		Ft.	in.
Section No. 33.	Soft Sandstone, yellow	12	0
	Coal	2	0
	Blaze, parting	0	6
	Coal	1	6
	Soft yellow Sandstone, with coal parting	5	0
	Band of Blaze	0	6
	Soft yellow Sandstone	9	0
	Coal, lower seam	20	0
	Blaze	2	0
		52	6

Dip S. to S.E., resting upon coarse hard grits.

		Ft.	in.	
Section No. 57½.	Soft fine Grits	25	0	
	Soft yellow Sandstone	6	0	
	Blaze	1	0	
	Coal	1	0	
	Soft Grits	18	0	
	Soft yellow Sandstone	10	0	
	Blaze	6	0	
	Coal	12	0	(Shown.)
		79	0	

Dip S. to S.E. 12°.

		Ft.	in.
Section No. 44.	Surface, fine Grits	25	0
	Soft yellow Sandstone	6	0
	Blaze	1	0
	Coal	1	0
	Soft Grits	20	0
	Soft yellow Sandstone	6	0
	Blaze	8	0
	Coal	32	0
		99	0

Dip S. to S.E. 8°. Remainder of coal covered by water.

		Ft.	in.
Section No. 43.	Surface (1 ft.), Wash (2 ft.)	3	0
	Marls, with Fossil Shells	30	0
	Soft fine Grits	6	0
	Soft yellow Sandstone	6	0
	Coal, upper seam	0	8
	Blaze Band	1	0
	Coal	0	6
	Soft white Sandstone, with shaly partings	23	0
	Blaze	2	0
	Coal	0	6
	Blaze Band	1	0
	Coal	30	0
	Shale Blaze	2	0
		105	8

Dip S. to S.E. 20°, resting upon hard quartz grits.

		Ft.	in.
Section No. 46.	Marls	20	0
	Fine Grits	12	0
	Soft yellow Sandstone	8	0
	Coal, top seam	0	8
		40	8

Dip S. 10°.

		Ft.	in.
Section No. 47.	Surface	1	0
	Coal, top seam	0	4
	Blaze Band	2	0
	Coal	0	8
	Soft white Sandstone	60	0
	Yellow Sandstone	30	0
	Blaze	2	0
	Coal, lower seam	20	0*
		116	0

Dip S. 8°. Remainder of coal in bed of creek.

		Ft.	in.
Section No. 47½.	Soft white Sandstone	60	0
	Yellow Sandstone	30	0
	Blaze	2	0
	Coal	10	0
		102	0

Dip S. 10°, resting to all appearance upon slate.

		Ft.	in.
Section No. 85.	Surface	2	0
	Sand and Silt	3	0
	Wash, alluvial	3	0
	Marls	50	0
	Fine Grits	20	0
	Soft Sandstone, with shaly partings	5	0
	Grit Band	3	0
	Soft Sandstone, with coaly partings	5	0
	Blaze	2	0
	Coal, top seam	3	0
		96	0

Dip E. to N.E. 20°, resting upon soft sandstone.

From the foregoing sections given, as may be remarked, the coal thickens on working south off the main east break in basin; also dips with great regularity throughout.

Marls.

South, about 4 chains from section No. 33 in traversing the Waimangaroa River down, is noticed the putting on of the marls over the grits, holding, in some places, nodules, or egg-shaped stones somewhat resembling flints, but in themselves clay ironstones, in which marls I have noticed fossil shells, and at times impressions of leaves. These marls extend south and east, being noticed extending up the tributaries and slopes of Frederick, extending well up the level, also east and up the slopes of Mount William ridge, till reaching south near N.W. shoulder of mount, section No. 85, where the grits are seen to crop from under same, the section extremity of this basin.

The coal in this area as marked, the upper through thin seam being of a soft description, while that of the lower is a hard clear coal of superior quality, resembling much in appearance that of Coalbrookdale.

High Level C (*Frederick*).—This level being a continuance of high level B, breasted by high level fault on the east, and sea fault on the west. The surface upon leaving high level B is composed of slate, holding in it veins of quartz (general run being N.E. and S.W.), while upon going south and east grits are noticed to put on broken, holding coal of a like description, same continuing south till meeting with E. to W. break, in the face of which the measures gain a great solidity. To the eastward of branch of Deep Creek the measures appear to gain in thickness, holding coal in many places on banks of same, showing thus:—

		Ft.	in.
Section No. 51.	Fine Grits	20	0
	Fine Sandstone	12	0
	Coal	20	0
		52	0

Dip. S. 20°, resting upon hard grits. The coal here is much crushed and shaken. I have therefore, as may be seen, marked a small part of this area, which no doubt could be worked to advantage in conjunction with the other areas.

* Shows above water.

High Level D (*Frederick*).—This level being a continuation of former level C, extending from east to west break south till reaching to Waimangaroa River. Same break holds grits of great thickness in face, with a general dip S. to S.E. On top of same, measures are noticed to put on holding coal, which upon going south increases considerably in thickness, till reaching near the Waimangaroa River an upper seam appears to put on, the measures bearing all appearance to basin in mid level E. The following sections obtained throughout this level:—

Section No. 90. Surface crops of coal 6 to 8 inches thick.

Section No. 89.

	Ft.	in.
Surface, fine Grits	10	0
Soft Sandstone, with shaly partings	4	0
Coal	6	0
	20	0

Dip S.S.E. 10°.

Section No. 87.

	Ft.	in.
Surface	1	0
Fine Grits	9	0
Soft Sandstone, with shaly partings	5	0
Blaze	2	0
Coal	15	0
Shale Blaze	3	0
	35	0

Dip S. to S.E. 10°, resting upon hard quartz grits.

Section No. 88.

	Ft.	in.
Surface (1 ft.), Grits (9 ft.)	10	0
Soft Sandstone	5	0
Blaze	2	0
Coal	10	0
Shale Blaze	2	0
	29	0

Dip S.E. to S. 10°, resting upon hard quartz grits.

Section No. 91. Coal crops, varying from 4, 6, and 8 feet.

Section No. 92.

	Ft.	in.
Surface, fine Grits	6	0
Soft Sandstone	3	0
Blaze	3	0
Coal	10	0
	22	0

Dip S. to S.W.

Section No. 93.

	Ft.	in.
Fine Grits	4	0
Soft Sandstone	3	0
Blaze	4	0
Coal	8	0
	19	0

Dip S. to S.W. 10°, resting upon hard grits.

Section No. 96.

	Ft.	in.
Surface	1	0
Fine Grits	10	0
Fine soft Sandstone	8	0
Coal	25	0
Brown Sandstone	6	0
	50	0

Dip W. 10°, resting upon white grit.

Section No. 97.

	Ft.	in.
Surface	1	0
Blaze	3	0
Fine Grits	20	0
Dark flaky Sandstone	24	0
	48	0

Dip S.W. 8°, resting upon hard grits in bed of creek.

The coal in this level is the same in description as that obtained throughout high level A, being in itself a coal of good quality, though soft and friable in nature. The coal throughout the area, as may be observed, dips regularly S. to S.E., the main dip south towards basin mid level E. In this level I am not satisfied but that there does exist a lower seam of coal, high faces of grit being seen in traversing Deep Creek, which crosses through this level (at a lower level than coal above given), resembling much in appearance those grits obtained in mid levels A, B, and C (floor of coal) on N.E. slopes of Mount Frederick; also, as may be seen from sections given in mid level E, along the banks of the Waimangaroa, showing two seams, and a doubt of a third, the probability being that the same lower seams pass

through this area, but on to slates at a low level in high level C, thereby prevented from making surface.

Mid Level E (*Frederick*).—This area situated to dip of high level D, being in itself a continuance of same (bounded on the north by Waimangaroa River, by main S.W. shoulder of Mount William on the south, on the east by Mount William, and west by a slate spur or bar reaching out into Rochfort Plateau, west of the south branch of the Waimangaroa River). Sections found in this area show thus:—

Banks of River Waimangaroa.

		Ft.	in.
Section No. 78.	Coal Surface		
	White to yellow Grits	25	0
	Soft dark Sandstone	12	0
	Fine white Grits	11	0
	Blaze	1	0
	Soft Sandstone	12	0
	Coal	40	0
		101	0

Dip S. to S.E. 8°, resting upon a floor of dark sandstone about 14 feet. Underneath same is noticed at water level a coal not unlike cannel coal, but on the whole resembling much in appearance that of Cascade lower coal. Sample of this I have already forwarded by Mr. Cox.

Waimangaroa.

		Ft.	in.
Section No. 94.	Coal	1	0
	Blaze	2	0
	Soft Sandstone	2	0
	Fine Grits	9	0
	Soft Sandstone	20	0
	Fine Grits	16	0
	Fine Sandstone	12	0
	Blaze	2	0
	Coal, middle seam	6	0
		70	0

Dip S. to S.W. 15°, resting upon hard grits.

Crossing of Waimangaroa.

		Ft.	in.
Section No. 85½.	Surface, fine Grits	20	0
	Soft Sandstone	5	0
	Fine Grits	3	0
	Fine Sandstone	3	0
	Blaze	2	0
	Coal, middle seam	3	0
		36	0

Dip S. to S.W., resting upon soft sandstone. Continuing east from section 8½ towards station L. 102, and along base line south till gaining S.W. shoulder of Mount William, is noticed a top covering of marls, same as those found in low level D. At this point the measures dip north till reaching slate bar, south branch, when they take a N. and N.E. dip, showing here sections of coal.

		Ft.	in.
No. 75.	Surface, fine Grits	6	0
	Fine Sandstone	4	0
	Coal, middle seam	18	0
	Dark Sandstone	10	0
	Coal, lower seam	10	0
		48	0

Dip S.E. 5°, resting upon hard coarse grits.

		Ft.	in.
No. 76.	Surface, fine Sandstone	4	0
	Fine Grits	20	0
	Fine Sandstone	8	0
	Coal, middle seam	17	0
		49	0

Dip N.E. to E., to all appearances troubled to north.

		Ft.	in.
Section No. 77. Yellow Bluff.	Surface, fine Sandstone	15	0
	Blaze	1	0
	Fine Sandstone	10	0
	Fine Grits	10	0
	Coal, middle seam	8	0
	Yellow Sandstone	15	0
	Soft brown Stone	16	0
	Soft Sandstone	20	0
	Coal, lower seam	4	0
		99	0

Dip S. to S.E. 10°, resting upon shaken stone and slate.

The coal in this area bears all appearance of forming a basin, inasmuch as the four dips of the measures have been here obtained, and the general appearance of the country bears the same out. Three seams of coal may be seen from sections existing in this (area) basin. The thin and upper seams, together with the middle seam and measures, correspond much with those of high levels throughout the field, while that of the lower resembles much that obtained throughout low level D, and also at edge of Cascade Break (Coalbrookdale).

The remaining part of this area is not marked as holding coal, being in itself an area of slate and reaching up the slopes of Mount William.

Mount William Ridge.—This ridge I have explored along its whole extent from Ngakawau Gorge, and south, till reaching summit of Mount William, finding it principally composed of slate reaching to surface, general run N.E. and S.W., holding in parts sections of shaken and disturbed grits and coal of a like description and wholly unmarketable, same indications continuing south till reaching traverse peg 20, on summit of ridge, where a small area is struck holding coal.

Section No. 27.

	Ft.	in.
Hard Grits	12	0
Blaze	2	0
Coal	6	0
Slate Blaze	4	0
	24	0

Dip S.W. 10°, resting to all appearance upon hard grits.

This coal is much crushed, but on the whole may be worked in conjunction with some of the other areas though small in extent. South from this, slates are observed along the surface, holding in them veins of quartz, till reaching near peg 48, where loose masses of grit are noticed, holding coal shaken and much crushed. Same disturbed indications continue south, showing slates, and in places holding coal (blind) till reaching south of station L. 20, about 10 chains, where the ridge shoulders out, puts on grits, holding coal of good quality; continues so, improving south, gaining thickness, width, and solidity, till reaching near summit of mount, where the coal evidently thins. The sections found in this southern extremity show as follow :—

Section No. 82.

	Ft.	in.
Surface, fine Quartz Grits	10	0
Fine Sandstone	2	0
Coal...	6	0
	18	0

Dip S. 10°, resting upon grey sandstone.

Section No. 81. East Face of Mount.

	Ft.	in.
Surface, fine white Grits	10	0
Soft Sandstone, with coaly partings	12	0
Coal	2	0
Blaze	1	0
Coal	1	0
Soft dark Sandstone	8	0
Fine Grits	12	0
Bar of Sandstone	4	0
Fine grits	14	0
Fine Sandstone	6	0
Coal	30	0
	100	0

Dip N. to N.E. 15°. No further section could here be obtained, vegetation preventing my getting any further information.

Section No. 79. East Face.

	Ft.	in.	
Surface, fine Grits	30	0	
Soft Sandstone	12	0	
Soft fine Grits	30	0	
Blaze	4	0	
Soft Sandstone Grits	30	0	
Soft Sandstone	12	0	
Coal, lower seam	6	0	(Shown.)
	124	0	

Dip N. to N.E. 10°.

Section No. 80. East Face.

Same as No. 79.

Section No. 57. West Face.

	Ft.	in.
Surface, fine Grits	24	0
Soft Sandstone	6	0
Blaze with Band of Coal	3	0
Black Stone	25	0
Grits, fine	4	0
Soft Sandstone	6	0
Dark Sandstone	4	0
Red Grits	10	0
Blaze	14	0
Coal	40	0
Fine grey Sandstone	6	0
	142	0

Dip N. to N.E. 10°., resting upon hard quartz grits.

Section No. 58. West Face.

	Ft.	in.
Surface, fine Grits	35	0
Blaze	8	0
Coal	1	0
Blaze	10	0
Coal	1	0
Soft Sandstone	12	0
Fine Grits	6	0
Blaze	8	0
Coal	2	0
Blaze	20	0
Wedge of hard Stone	2	0
Coal	3	0
Shale Blaze	2	0
Hard Grits	15	0
Coal	4	0
Coarse hard Grits		
	129	6

Dip N.W., resting upon coarse hard quartz grits.

Section No. 59. West Face.

	Ft.	in.
Surface, fine Grits	24	0
Soft Sandstone, with coaly partings	6	0
Coal	6	0
Blaze	10	0
Soft Sandstone	30	0
Fine Grits	3	0
Blaze	1	0
Coal	0	3
Soft brown dark Stone	25	0
Soft yellow Sandstone	10	0
Blaze	4	0
Fine soft brown Sandstone	20	0
Coal	2	0
Blaze	2	0
	143	3

Dip W. 15°, resting upon soft brown stone.

Further to south towards summit of Mount (Cairn) than those sections above given, the coal thins down to 4, 3, 2, and 1 feet, as seen on both sides of mount, working out to surface. A chain or two to south of Cairn the mount breaks, forming the Cascade break. The quality of the coal in this height is of an average quality, being much the same as that obtained in mid level E. Three seams throughout this part are traceable, the upper being thin seams, and the lower holding a considerable thickness. The sections, if compared with those of mid level E, bid fair to correspond.

The western slopes of the mount and ridge—that is, from under summit north to Ngakawau Gorge—are composed of slate and granite, this holding till covered by the capping of the measures of the low levels.

The eastern slopes of this ridge resemble much in appearance those of the western; but at a point station L. 4, on descending eastward, the grits appear to put on well, though troubled, till gaining the plain at base, which extends north, from opposite this point, towards Mohikinui, into which I had a preliminary visit; picked up a crop of coal in the valley 12 feet thick, with a dip north, and crop on to slates (general run of slates here N.E. by N., S.W. by S.). This plain covers a considerable area of country, and bids fair to hold coal throughout, of considerable thickness and extent towards north.

To the south of this point till reaching under the summit of William eastward, the country presents a very rugged appearance, which, judging same from a distance, is principally composed of slate.

Coalbrookdale (Rochfort).

This area extends along and under S.W. shoulder of Mount William north, reaching Cascade Break east, Whareatua waters on the south, and slate ridge on the west. In this area the measures on the western side are much shaken, the coal held being thin, and bearing same appearance as the measures, owing no doubt to its closeness to slate; and on the north side, under S.W. shoulder of mount, the measures continue to hold thin coal, but improve in thickness in working east towards Cascade Break, where the whole appears to form into a somewhat disturbed basin, all but cut in places by several slate bars crossing same. Along the edge of Cascade Break, sections are obtained holding coal of considerable thickness, and holding two seams in all. On the S.W. edge of the basin, out-crops are obtained on the north side of ridge, station V. 10, and saddling to S.W. into Whareatea Valley (Rochfort Plateau). The sections obtained throughout this basin show as under:—

Section No. 74. Westside of basin.

	Ft.	in.
Grits troubled	10	0
Soft Sandstone	3	0
Coal	2	0
Bluish Grits	12	0
	27	0

Dip S. to S.E., resting upon slates.

Section No. 60.

	Ft.	in.
Surface	2	0
Soft red Grits	20	0
Soft Sandstone	30	0
Fine white Grits	10	0
Soft yellow Sandstone	8	0
Coal	0	3
Blaze	0	3
Band of Stone	0	6
Coal, blind	2	0
Shale	1	0
Coal, blind	1	0
Soft dark Sandstone	10	6
Coarse Grits	10	0
	96	0

Dip N.E. to N., resting upon slate coal, troubled and blind.

Section No. 62.

	Ft.	in.
Surface	2	0
Soft red Grits	20	0
Soft Sandstone	25	0
Fine Grits	4	0
Soft Sandstone	8	0
Coal	6	6
Band of Blaze	1	0
Coal	1	6
Soft grey dark Grits	20	0
	88	0

Dip N. to N.E. 20°, resting unconformably upon slates. Coal improving in quality.

Section No. 63.

	Ft.	in.
Surface, fine Grits	20	0
Soft Sandstone	5	0
Coal	0	6
Fine Grits	10	0
Soft Sandstone, with coaly partings	10	0
Coal	8	6
Band of Blaze	1	6
Coal	2	0
Dark grey Stone	20	0
	77	6

Dip E. to N.E. 20°, resting upon slate.

Section No. 65.

	Ft.	in.
Surface, fine Grits	20	0
Soft dark brown Sandstone	12	0
Band of Blaze	2	0
Soft dark brown Sandstone	6	0
Fine Clay	0	3
Coal	8	6
Band of Blaze	2	0
Coal	2	3
Grey Sandstone	20	0
	73	0

Dip S. to S.W. 10°.

		Ft.	in.
Section No. 68.	Surface, fine Grits	20	0
	Soft Sandstone	20	0
	Coal	14	0
		54	0

Dip S.W. 10°, resting upon blaze.

In bed of creek, the coal from this point continues improving in quality and thickness east, till meeting with face of Cascade Break, where sections of coal show thus :—

Edge of Cascade Break.

		Ft.	in.
Section No. 72.	Fine Grits	12	0
	Dark Sandstone	10	0
	Blaze	3	0
	Sandstone Grits	15	0
	Coal	16	0
		56	0

Dip N.E. 10°, resting upon grey stone and slate.

		Ft.	in.
Section No. 73.	Fine Grits	8	0
	Soft fine Sandstone	4	0
	Coal	5	0
	Dark Sandstone	20	0
	White Sandstone	14	0
	Coal	18	0
		69	0

Dip N. to N.E. 10°, resting upon dark grey sandstone.

The coal, as may be observed from the foregoing sections, is in some places shaken, and in a few blind ; but where it commences to basin as at Nos. 62, 63, and 65, the coal is of superior quality, clear, hard, and light, burns freely, and cokes with a remarkably light and hard coke. Near the centre of the area the coal holds a thickness of about 8 feet, but towards Cascade Break thickens out to 18 feet lower seam, while that of the upper holds a thickness of 5 feet, being both very superior in quality.

Fire Clay, as may be noticed, of three inches in thickness (underestimated), shows itself in roof of section No. 65, which layer was only noticeable from the clear section obtained, which, I have no doubt, continues throughout the entire area.

Plateau (Rochfort).—This area being as yet only partially explored, my success so far being in seeing a few sections of coal along the banks of Waimangaroa River (which were only noticeable by looking over precipice). In the centre of this area the measures are cut by two slate ridges, covering a considerable extent of the surface, from which the grits appear to make, and dip steadily N.W., W., and S.W. towards brink of plateau, a few outcrops being in places noticed on surface. For the successful working of this area, it will be best undertaken by working from the low country up, under, and on to plateau, by which I shall be best able to come at a definite decision regarding the area previously mentioned; which work has already been sanctioned to be undertaken during the present winter months.

High Levels (Rochfort).—Those heights confined to that area of country situated south of river Whareatea, and reaching up the N.E., N., and N.W. slopes of mount on to summit. The exploring of this area I have worked from the dip of the measures Coalbrookdale and up the heights towards crops, showing as follows :—

		Ft.	in.
Section No. 112.	Surface, fine Grits	20	0
	Soft Sandstone, dark	15	0
	Blaze	4	0
	Coal, upper	1	0
	Blaze	5	0
		45	0

Dip N. 10°, resting upon dark sandstone in bed of creek.

		Ft.	in.
Section No. 97.	Surface	1	0
	Blaze	3	0
	Fine Grits	20	0
	Dark flaky Sandstone	24	0
		48	0

Dip N.W. 8°, resting upon grits, fine.

		Ft.	in.
Section No. 102.	Soft Sandstone	10	0
	Blaze	4	0
	Coal	0	6
	Blaze	8	0
	Dark flaky Sandstone	12	0
		34	6

Dip N.E. 12°.

Section No. 101.

	Ft.	in.
Surface	3	0
Pine Sandstone Grits	4	0
Blaze, with coaly partings	12	0
Band of dark Sandstone	1	0
Shale Blaze	2	0
Fine red Grits	2	0
Blaze	1	0
Soft Sandstone	1	6
Blaze	2	6
Dark Sandstone	1	6
Fine Sandstone	15	0
	45	6

Dip N. to N.E. 20°, resting upon white grits.

Section No. 103.

	Ft.	in.
Fine Grits	25	0
Coarse Band of Grits	6	0
Blaze	3	0
Coal, upper seam	1	0
Blaze	2	0
	37	0

Dip N.E. 15°, resting upon pebble beds.

Section No. 115. Loose junks of coal working up into face of coal, 3 feet only seen (lower seam).

Dip N.E. 20°.

Section No. 113. Head of branch of Cascade Creek.

	Ft.	in.
Soft Sandstone	12	0
Coal, lower seam	18	0
Shale Blaze	4	0
Grits	20	0
	54	0

Dip N.E. 20°, resting upon slate.

Section No. 118. Near Trunk Line, Whareatea.

	Ft.	in.
Blaze	2	0
Quartz Grits	30	0
Soft Sandstone	30	0
Coal, lower seam	6	0
Troubled dark grey Stone	10	0
	78	0

Dip irregular, and general tendency northward, and resting upon slates.

With the sections above given, two on the east side of the area, Nos. 115 and 113, and one on the west, No. 118, holding coal similar to that of Cascade Break lower seam, the remaining sections holding thin coal, but higher in measures proving the existence of two seams throughout this area, the upper through thin seam holding a thickness of from 6 to 12 inches, while that of the lower from 18 to 6 feet, which appears to thin towards south of the slopes of mount, till reaching peg 210 Trent's line, where the upper coal and blaze is seen all but on the surface, while that of the lower (seam) I have not traced further than section 113, being prevented from steepness of Cascade Break, which will have to be undertaken from the low country Cascade Creek. Higher up on to summit of mount the upper seam is noticed on surface, and appearing to thin out on nearing summit, holding a dip of 20° N.W. (see section No. 103). As may be here observed, a change in the measures is noticed in pebble-beds being observed, under edge of break, holding considerable thickness.

The coal held in the above area appears similar to that of Coalbrookdale.

Remarks.

Two seams have for most part been obtained throughout the greatest extent of this part of the field, and a doubt exists whether there is not a third, the upper being a thin seam 3 feet, holding coal of an average quality, while that of the under is a coal superior in quality, varying in thickness from 37 to 8 feet; dips at comparatively easy angles, the greatest being 20°, and the lowest 5°.

These areas of coal can for most part be worked by tunnels put into faces of breaks, holding in same open sectional faces of coal, thereby allowing of an output being obtained from commencement of operations, with only two exceptions, viz. the greater part of low level D and mid level E, which would require to be worked by shafts, and would not in any instance reach over a depth of 150 feet at most. The seams hold generally over them an excellent roof, grits and sandstone, which should stand well, when opened out upon, and, together with the coal being free and easily wrought, should allow of an output at a low cost.

Timber suitable for mining purposes throughout this field is only obtainable in very limited quantities along the edge of sea fault near summit of Frederick, and part of western slope of Mount William Ridge.

In the east side of high level A, throughout the other mid levels, and also in high level D, I have considerable doubt whether there does not exist a lower seam of coal in these areas, the same, if it does exist, being no doubt resting against granite belt mentioned in west side high level A, and not crop to surface. Upper stone being noticeable throughout those areas in part offers good inducement for putting down a bore to test same, which, by a judicious selection of site, may be tested at a comparatively short depth. If successful, the result would tend to prove the continuance of same throughout the areas above mentioned, and the greater part of east boundary of the Ngakawau section, greatly extending the field already known through surface explorations.

I have, &c.,
ROBERT B. DENNISTON,
Coal Viewer.

Camp, Rapia Creek, 30th June, 1875.

No. 3.

Mr. W. M. COOPER to the ENGINEER-IN-CHIEF.

TOPOGRAPHICAL SURVEY OF BULLER COAL FIELD.—REPORT FOR JULY, 1875.

DURING this month the men have been engaged in cutting the necessary lines in the block of country lying between the Whareatea and the Waimangaroa Rivers on the one hand, and the edge of the Mount Rochfort plateau and the low flat Pakihis on the other. This is now completed and partially traversed. I have been in the field a week traversing the lines; the remainder will occupy about a week more, after which the camp will be shifted to the Waimangaroa, and the country worked to the northward.

2. The weather has been broken and stormy during the month, so that less work has been done on that account. The total amount of bush lines cut is 5 miles 45 chains, and of lines traversed 3 miles 53 chains.

3. The map has not progressed much this month, the time having been considerably cut into by the half-yearly returns, &c., calculating heights and angles, and being in the field. I likewise spent three days in taking a couple of sketches near the quarry of the Mount Rochfort and Mount Frederick ridges, and working them up into good-sized water-colour drawings: these were for the Hon. the Premier, Mr. T. M. Mackay, who arrived here early in the month, having informed me that the Hon. Dr. Pollen had requested him to get a view taken of the country in the vicinity of the quarry, and there was no one here to undertake the task but myself.

4. As I remarked in a recent memorandum, the continuation of the field operations during the winter season, whilst it conduces to the earlier completion of the field work, materially interferes with the prosecution of the mapping, so that, unless the Government should think it advisable to supply me with the temporary assistance of a draftsman (as I understand was originally intended), the plotting of work already done must be much delayed, and additional work to be plotted will be continuously accruing.

MINING OPERATIONS.

5. The only mining operations at present being carried on are upon the prospecting licenses of Messrs. Roche and Mulholland respectively.

6. *Roche and Party.*—The new seam said to have been discovered, and alluded to in paragraph 15 of my General Report of 30th June, 1875, and respecting which instructions were sent by the Under Secretary to Mr. Denniston, appears from Mr. Denniston's monthly report enclosed herewith to have no existence. I am informed that the party have discontinued the drive on which they have so long been engaged, and are about to drive to the dip, so as in some measure to test the width of the seam. As however the seam dips at a very high angle (about 40°), they must necessarily work at a great disadvantage, the more so as the drive would, in a short distance, be below the level of the river.

7. Mulholland, or Sims and party are still engaged in putting in the drive mentioned in paragraph 16 of my General Report of 30th June, 1875, and anticipate arriving at the point at which they expect to strike coal in three or four weeks' time.

8. Mr. Denniston is at present, and will probably be for about a month, engaged in exploring the Waimangaroa Gorge, in the vicinity of the two claims. I enclose his report of operations for July.

W. M. COOPER,
Topographical Surveyor.

Westport, 2nd August, 1875.

Enclosure in No. 3.

Mr. R. B. DENNISTON to Mr. W. M. COOPER.

PROGRESS REPORT OF COAL EXPLORATIONS ON PART OF SEAWARD FACE AND SLOPES OF MOUNT ROCHFORT PLATEAU, JULY, 1875.

MY past month's labours have been occupied in exploring part of that slip country situated on and under the (western) seaward side of break of Mount Rochfort plateau, commencing near the Rapid Creek, working south to the River Whareatea, and north from Rapid Creek till reaching the River Waimangaroa (Roche's mine).

Face of Plateau.

Along the face edge of plateau south from Rapid Creek, towards Whareatea River, no sections have been obtained holding coal; merely a few holding thin bands of blaze, as seen in a small tributary of the Whareatea showing thus:—

Western Face of Plateau.

		Ft.	in.
Section No. 128.	Blaze	1	6
	Sandy Grit	25	0
	Blaze	1	0
	Red Grit	30	0
	Blaze	1	0
	Fine to coarse Grit	20	0
	Blaze	3	0
		81	6

Dip W. 15°.

Continuing south, no further sections are obtained till reaching the River Whareatea, which is in itself well worn down into the measures. In the traversing of same up east, extending well into the plateau, was only noticeable at times thin bands of blaze, no coal having been observed either in bed of river or upon the slopes. Here sections could not be obtained, owing to loose boulders and *débris* being everywhere around. North from this, in face of plateau near Rapid Creek, sections are obtained which show as follow:—

		Ft.	in.
Section No. 124.	White Quartz Grit	50	0
	Blaze, with Bands of Stone	10	0
	Coal, crushed	4	0
	Dark Shale and soft Stone	8	0
		72	0

Dip W. 15°, resting upon hard sandy grits.

	Ft.	in.
White Quartz Grits	20	0
Blaze	6	0
Coal, crushed	3	0
Shale, Blaze, and Stone	8	0
Sandy Grits	20	0
Blaze	5	0
Soft Sandstone Grits	30	0
Shale, Blaze	2	0
Coarse Grits	120	0
Blaze	4	0
Coarse hard Grits	35	0
Band of Blaze	2	0
	255	0

Dip W. 15°, resting upon coarse hard quartz grits.

North from this point I have continued exploring, but have failed to obtain any further sections in face of plateau, being prevented from obtaining same from the quantities of loose *débris*, which continues north till reaching ridge forming water-shed into the Waimangaroa River, the furthest north point I have at present worked up to on this height.

Slip Country.

This area of country, situated under the western face of plateau (reaching well out into low country near railway), I have worked from the River Whareatea (south) towards and to the River Waimangaroa (north), the country generally presenting a rugged and broken appearance, holding thin bands of shale and coal at high angles, 40°, the coal being in itself much crushed. The sections found show as follow:—

Tributary of Whareatea.

		Ft.	in.
Section No. 128.	Blaze	1	6
	Sandy Grits	25	0
	Blaze	1	0
	Red sandy Grits	30	0
	Coarse Grits	30	0
	Blaze	1	0
	Fine to coarse Grits	80	0
	Blaze	3	0
		171	6

Dip W. 39°.

North of Rapid Creek.

		Ft.	in.
Section No. 126.	Coal crushed	3	0
	D. R. brown Sandstone	14	0
	Soft red Sandstone	12	0
	Coal	2	0
		31	0

Dip W. 40°.

North, about twenty chains from No. 126.

		Ft.	in.	
Section No. 127½.	Clay Marls, D.R. Sandstone, Grits	20	0	(Seen.)
	Blaze	2	0	
	Soft Sandstone	4	0	
	Coal and Blaze	1	0	
	Fine Grits	20	0	
	Dark Sandstone	80	0	
	Band of Grits	6	0	
	Soft Sandstone	8	0	
	Coal	1	0	
	Blaze	1	0	
	Grey Grit, Shaling	1	0	
	Sandy fine Grit	30	0	
	Blaze	4	0	
	Fine Grit	35	0	
	Dark Sandstone	40	0	
		253	0	

Dip W. 40°.

Here no further sections could be obtained, *débris* and loose stones preventing my obtaining more information.

No. 129. Coal in sidling of ridge, water-shed into Waimangaroa, surface covered with loose crushed coal crops of Roche's seam.

Throughout this area of country I have not been successful in tracing coal of any great thickness; from leaving the Whareatea towards North the blaze appears to run regular throughout, holding about the same thickness, while the coal found appears to thicken upon going north, till, gaining section No. 129, at the dip of same is struck, about forty chains in low levels, Roche's mine, exposing a seam of crushed coal 18 feet, dip W. 40°, being much similar in description and quality to that of the Ngakawau Albion Mine.

Remarks.

The body of coal, as may be here observed, as seen on edge of Plateau Nos. 124 and 125, being in itself crushed, inferior in quality, and thin (3 feet), from the limited information I am in possession of I am not in a position to say how far it may extend out into the plateau. From the depth of sections obtained, showing under same thin seams of blaze, I would be of opinion that this is the only seam that may be looked for to pass through the plateau eastward (towards slate ridges).

The slip country to the westward of plateau, as may be seen from sections given, hold coals to the south much crushed and thin, but upon working north appear to thicken upon nearing the Waimangaroa, still crushed, holding throughout the same steep dip as Roche's mine, 40°, the measures generally being much broken and shaken, holding quantities of *débris* on surface, which has prevented me much in obtaining information. The continuance of this coal to the dip leaves the same doubt as that stated regarding Albion Mine, Ngakawau.

Clay marls have been observed to pass the whole way along from the Whareatea north to the Waimangaroa, and I would judge them to hold a thickness of several hundred feet.

Sims and party, north side of Waimangaroa River, are still persevering with their drive, and contemplate cutting coal in about three weeks' time.

As instructed by telegram, 25th June, to examine and set off work for a new seam of coal found by Roche and Co., I visited their mine as directed, and found that no such seam had been found, their manager knowing nothing of such.

I have, &c.,
R. B. Denniston,
Coal Viewer.

"Camp," Waimangaroa Gorge, 31st July, 1875.

By Authority: George Didsbury, Government Printer, Wellington.—1876.

Price 1s.]