Attention has been directed to the coal at Ben More, which lies in a less accessible position at the back of the Malvern Hill, as it was supposed to be of such superior quality as to warrant an extension of the railway system to bring it within reach of the market; but the samples submitted by the promoters of a company formed to mine this coal prove it to be a brown coal of the same value as that which is abundant in the front part of the range.

SUMMARY.

From the foregoing summary it is evident that the source of supply of coal adapted for marine steamers in the Colony has narrowed down to the coal fields at Collingwood, Mount Rochfort, and the Grey, and it is desirable that the effort to supply the market from our own coal fields should be concentrated on these districts.

I would also propose to assist in the development of the Northern coal fields, situated north and south of the Bay of Islands; for though not yielding such a useful description of coal, the coal found there is sufficiently good to be in demand for working stationary engines at the Thames, and for the supply of which demand they are most conveniently situated.

The remainder of the coal fields in the Colony, which yield only brown coal, are sure to be developed whenever they are easy of access and there is a local demand; and I would recommend that in future assistance should be given towards the development of such deposits only in the form of subsidies to local efforts.

At the same time, as brown coals are so abundantly distributed, I think it advisable that carefully conducted experiments should be instituted, with the view of ascertaining if they can be adapted by any artificial process for the use of locomotive engines.

The principal varieties in the quality of the brown coal found in New Zealand appear to arise from three causes:—

(1.) The coal seams in some localities have been on fire, and for a considerable area round the coal that is burnt, the seam is converted into pitch coal, containing less water, and having bituminous or resinous matter disseminated throughout its substance. It should be remarked, however, that the variety which I designate pitch coal frequently occurs where there is no evidence of such local action, and its character must then be attributed to the peculiar nature of the vegetable matter from which the coal seam was originally formed.

(2.) When igneous rocks, either contemporaneous or of subsequent date to the deposit of coal, have affected the seams, the coal has been changed into a glance coal of various degrees of hardness, from a laminated brown coal in which only incipient alteration can be observed, to a perfect anthracite or stone coal, but never in any case being converted into a caking coal, or one that yields a coherent coke.

(3.) Where extensive areas containing coal seams, such as the upper secondary strata on the West Coast, have been raised in anticlinal arches, and by complex disturbance have been subjected to pressure and thorough drainage, the coal is converted into a bituminous form which closely resembles in character and equals in value some varieties of coal found in the true carboniferous formation, as they form a coherent lustrous coke and yield an illuminating gas.

In each of the above cases the chief change in the coal is the expulsion of the combined or constitutional water, and in the first and third case the substitution for it of bituminous matter (hydrocarbon).

Such a change could undoubtedly be effected by artificial means, and all that requires to be determined is whether the manufacture of such artificial fuel from brown coal would be profitable.

During the ensuing year I recommend that the following explorations should be charged against the grant for the development of coal fields:—

Estimates.

A. Development of coal seams of estimated value:	
1. Completion of the Exploration Tunnel at Collingwood	£500
2. Exploration of the coal seams at Pakawau	150
3. Tracing the extent of the coal on the Mount Rochfort plateau, and at Waimongaroa	500
4. Tracing the coal measures on the south side of the Grey River	500
5. Proving the down-throw of the fault in the Brunner Mine, and determining the best way of working the coal on the north side of it	200
B. Subsidies to assist local committees in searching for coal	1,000
C. Grant already allotted to the Kawa Kawa Company	1,000
	£3,850

The following table gives the composition of the various coals which have been analysed during the past year, in continuation of the schedule appended to my last report.

20th August, 1873. JAMES HECTOR.