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## Chapter 38 Economics

### Lignites of South-West Mull

The lignites of this district have already been dealt with in Chapter 3, where further details were promised regarding the Beinn an Aoinidh, or Cadh' an Easa' seam (Sheet 44), which is the one that has received most attention in the past.

This seam outcrops on both sides of the valley drained by the small stream running past Airidh Mhic Cribhain. On the western side of the valley, it occurs at a distance of about 40 ft. below the base of a rather massive porphyritic lava, which fortunately can also be seen on the eastern, or Beinn an Aoinidh, side, thus witnessing to the identity of the coal-seam in its two separated outcrops. At Dearg Bhealach, or Cadh' an Easa', where the seam occurs at the top of the sea-cliff, one section reads as follows:

|                                       | Inches. |
|---------------------------------------|---------|
| Igneous rock                          | —       |
| COAL                                  | 2 to 6  |
| Carbonaceous shale                    | 6       |
| BRIGHT COAL                           | 6       |
| Clay                                  | ½       |
| BRIGHT COAL                           | 3       |
| HARD SPLINTY COAL (with brown streak) | 6       |
| Carbonaceous shale                    | 12      |
| Igneous rock                          | —       |

The coal is here very irregular, and the section alters from point to point. It was found about half a mile inland in the bed of the stream at Airidh Mhic Cribhain, where it was at least 18 in. thick.

On the Beinn an Aoinidh side of the valley, the coal is seen in the burn running to the north-west, which is shown in the one-inch Map, and named in the six-inch Map Allt a' Ghuail (Burn of the Coal). It here immediately overlies an inclined sheet of dolerite, and is in a burnt condition, though at least 2 ft. in thickness. It is better developed in a parallel stream, nearer the cliff, which the writer has been told is the real Allt, or Eas, a' Ghuail. Here, the seam is some distance above the intrusion, and measures at least 3 ft. of bright coal, with a clay-roof, and a hard layer of carbonaceous shale at base. Jameson mentions that an attempt to work the coal on Beinn an Aoinidh was made in the beginning of the eighteenth century, <ref>R. Jameson, Mineralogy of the Scottish Isles, vol. i., 1800, p. 221; for account of Coal-Mining dating back to 1588, see J. M'Cormick, History of Mull, Celtic Monthly, 1917, vol. xxv., p. 51, and published separately, 1921</ref> and there have been various trials of more recent date. The coal has been used in the smithy at Pennygael, but the workings were all soon abandoned. Quite apart from the irregular nature of the seam, the difficulty of transport would be such as to make exploitation on any large scale, in all probability, impossible.

E.M.A.

These field-details may be supplemented by recourse to a valuable report prepared by Dr. W. Pollard in 1903, before the Geological Survey entered the district. It is drawn upon with the kind permission of the Duke of Argyll.

### Chemical report on specimens of coal from South-West Mull

I. (No. 114). Ardtun, one-inch Map, Sheet 43 (Specimen from top of box).

II. (No. 115). Same as I. (Specimen from bottom of box). (No. 116). Cadh' an Easa', South Shore, Sheet 44.

IV. (No. 117). Eas Dubh, Shiaba, Sheet 43.

**Proximate analysis**

|                 | I      | II     | III    | IV     | V      |
|-----------------|--------|--------|--------|--------|--------|
| Moisture        | 14.95  | 15.69  | 11.38  | 8.23   | 5.52   |
| Volatile matter | 25.09  | 24.12  | 33.35  | 30.40  | 42.70  |
| Fixed           |        |        |        |        |        |
| Carbonaceous    | 25.03  | 24.46  | 38.33  | 25.91  | 41.50  |
| Residue         |        |        |        |        |        |
| Ash             | 34.93  | 35.73  | 16.94  | 35.46  | 10.28  |
| Total           | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Total Sulphur   | 2.92   | 1.55   | 1.05   | 1.28   | 1.66   |

**Ultimate analysis**

|                            | III.   | V      |
|----------------------------|--------|--------|
| Carbon                     | 54.65  | 67.27  |
| Hydrogen                   | 3.73   | 4.98   |
| Oxygen                     | 12.03  | 10.32  |
| Nitrogen                   | 0.80   | 1.02   |
| Combustible Sulphur        | 0.57   | 0.61   |
| Ash                        | 16.94  | 10.28  |
| Moisture                   | 11.38  | 5.52   |
| <b>Total</b>               | 100.00 | 100.00 |
| Sulphur in Ash             | 0.48   | 1.05   |
| Calculated Calorific Value | 5144   | 6702   |

Composition of the combustible matter, i.e., of coal, exclusive of sulphur, ash, and moisture.

|          | III.  | V     |
|----------|-------|-------|
| Carbon   | 76.71 | 80.46 |
| Hydrogen | 5.25  | 5.96  |
| Oxygen   | 16.92 | 12.36 |
| Nitrogen | 1.12  | 1.22  |

The coals are of the Lignitous Class, in some respects similar to those found at Bovey, Devon. It should be stated that freshly mined specimens would probably contain more moisture than is shown above, as the samples received were packed in wooden boxes, which would allow of drying.

Dr. Pollard's conclusions regarding the analysed specimens are as follows:

1. The percentage of ash is high. In Nos. I., II., and IV., it amounts to 35 per cent., so that these are really Carbonaceous Shales or highly impure coals. No. V., is much better in this respect, as it contains only 10 per cent., a quantity not much greater than is found in some well-known Scottish coals.

2. The coals are also sulphurous, though not excessively so.

3. Their high percentage of volatile matter and low percentage of carbon give them a low heating power, and probably make them smoky in burning. They contain from 5 to 15 times as much ash as the lignite of Bovey. It is not likely there will be much demand for them as fuel, unless the best qualities can be carefully separated by picking; even then, the demand could only be local.

**Petroleum**

Dr. Heddle quotes a record of petroleum impregnating a zeolite from Beinn an Aoinidh (Sheet 44). Locally, the Beinn an Aoinidh Coal has been invaded by intrusions; and no doubt this has led to natural distillation of petroleum. There is, however, no probability whatever of finding petroleum in Mull on a commercial scale. E.B.B.

## Graphite

The occurrence of graphite in Mull has occasionally received notice, and an attempt was made at one time to work some graphitic material to the west of Dererach, on the north shore of Loch Scridain (Sheet 44). All that was found must have been contained in large xenoliths, or blocks isolated in igneous rock, and the few other known occurrences are probably of the same nature (see Chapter 24). It is very unlikely that there is anywhere enough of this material to pay exploitation. E.M.A.

## Iron-ore

Iron-ore in commercial quantities has not been found in Mull, though certain minor occurrences of magnetite have from time to time attracted attention. These belong to the Corra-bheinn and Ben Buie Gabbros, respectively, of Chapter 22.

In the Corra-bheinn Gabbro, on the hillside nearly half a mile west of Cruachan Dearg, there occur lenticular patches, which appear to contain an unusually large proportion of magnetite. None of the patches observed exceeds 12 ft. in length, and 3 ft. in thickness, but they have a habit of occurring near one another along the same strike. (C.T.C.) In the banded complex, which forms the margin of the Ben Buie Gabbro west of Loch Fuaran (p. 245), there are seams consisting chiefly of magnetite, but their individual thickness is only about 4 inches. G.V.W.

## Sapphire

The occurrence of sapphires, easily recognizable in hand-specimens, is a feature of many of the xenoliths described in Chapter 24. Exceptionally, they measure half-an-inch across, but are thin and plate-like and full of inclusions, and it is very doubtful whether they have any commercial value except as curiosities. The most easily found localities are those on the north shore of Loch Scridain (Localities 9–13, p. 272) and at Rudh' a' Chromain (Locality 50). E.M.A.

## Road-metal

There is no difficulty in finding potential road-metal for local purposes. The only difficulty arises in making use of it economically where traffic does not justify expensive quarrying. The most important road-metal quarry of the district is in a basalt, or andesite, lava of Old Red Sandstone age on the south shore of Loch Feochan. Most of the Mull roads are metalled from little pits in moraine, raised beach-gravel, well-jointed basalt-dykes, or rotted basalt-lava; and the result is not very satisfactory.

If south-west Mull were more conveniently situated, there can be little doubt that its columnar basalts would supply an export industry of road-metal. The material is almost certainly of good quality, and its jointing is such as to facilitate quarrying. The only two localities in south-west Mull, which might possibly afford opportunities for shipping material derived from columnar basalts, are the Ardtun Peninsula, north of Bunessan, and Tavool, on the north shore of Loch Scridain (Sheet 43). Better shipping accommodation is, of course, to be had at Loch Aline (Sheet 44) and Tobermory (Sheet 52); and the basalt of Calve Island, at the mouth of Tobermory Bay, is somewhat columnar.

## Diatomite

In 1851, the Duke of Argyll drew attention to an occurrence of diatomite, or kieselguhr, near Loch Bà (Sheet 44); and, in 1853 and 1854, Dr. W. Gregory published descriptions of its contained diatoms (see Bibliography). Since then, the deposit has naturally attracted attention from the point of view of exploitation. Unfortunately, however, it is of very limited extent, and thin; so that it cannot be described as promising. Details obtained by Mr. Tait are as follows: The deposit is

the filling of a small pool, now grown over with rushes and moss. It lies in a channel connecting Benmore Lodge and Knock; and, in time of flood, a stream issues from Loch Bà and passes through the pool. It lies just west of a fence bounding a plantation, 500 yds. east of Knock. Its maximum measurements are 100 yds. by 70 yds. In two pits dug in 1915, rather near the edge of the basin, diatomite was found from 10 inches to 1 ft. 3 in. in thickness. It rested on grey gritty clay, and was covered by about 2 ft. of peat. The diatomite or 'white clay,' is known to the people of the neighbourhood, who used to use it as white-wash.

### **Brick-clay**

Marine clays, similar in character to those used for brickmaking in the Forth and Clyde districts, are exposed as ridges from under gravel in the fields of Kinlochspelve Farm (Sheet 44). There is plenty of material in a position which would allow of easy working. Where seen, however, the clay contains shell-fragments, which interfere to some extent with its quality. E.B.B.

### **Shell-sand**

Many of the Western Isles, including Iona, have extensive deposits of shell-sand, either on their beaches, or forming coastal dunes. The natural distribution of this material by wind has helped greatly in furnishing a fertile soil. In Mull, there are such accumulations in the western part of the Ross, for instance, east of Port Uisken (Sheet 35); but much the most important is to be found at Calgary Bay (Sheet 51). Here, an endless supply of sand, containing rather more than 70 per cent. CaCO<sub>3</sub> is available, and could be easily shipped for local purposes. G.V.W.

### **Other economic minerals**

The district has some other economic resources, such as: Granite in the Ross; slate in Kerrera and Seil; Limestone in Lismore and Inchkenneth; Sandstone at Loch Feochan, Carsaig, and Bloody Bay; and Glass-Sand at Loch Aline; but these belong to the Pre-Tertiary rocks and are dealt with in a memoir entitled the Pre-Tertiary Geology of Mull, Loch Aline, and Oban. E.B.B.