

face—since covered over. On the historic farm of Leanach a seam of coal 6 inches thick crops up, and, on the same estate, that of Culloden, there are indications of fire-clay. In Strathnairn coal has recently been found; whilst in quite another direction—at Inveraray, in the county of Argyll—a large hole is still to be seen out of which the people used to dig a kind of shale which they burnt along with peats.

It is thus abundantly established that coal is not confined to the areas usually assigned to it, and that this most important field of inquiry is still far from being exhausted.

III. *Chemical Notes of Analyses of various Coals and Peat Fuels.* By ANDREW TAYLOR, Associate.

The following analyses originated in a desire to make sure that M. Challeton de Brughat's fuel was in reality a simple peat, the close texture and hard metallic ring of the substance inducing some members present on its exhibition at the meeting of the Society on 4th December 1873 to think it a heterogeneous compound. Mr Ralph Richardson subsequently supplied me with Mr Danchell's (Horwich) peat fuel, made, too, like Challeton's, by pulping and subsequent drying; as well as with Kidd's peat charcoal, manufactured by charring bog peat in sheds, closed from access to air, by its own vapour and superheated steam. The Dumfries peat made by Clayton's process, it is understood, undergoes no lengthened maceration. The Limerigg and Benhar specimens represent the Virtuewell seam, celebrated for yielding the best household Scotch coal. The specimens of Seafield patent fuel were taken on the opening day of that manufactory (6th March 1874), and perhaps do not fairly represent its commercial value; but, as already hinted, this was not proposed in any of the analyses. Both Challeton's and Danchell's product show a close approximation in the relations of coke and volatile matter; they approach nearer the lignite in the proportion of coke than Clayton's manufacture. The fact of the first two manufacturers keeping their products for some time under water is interesting, as tending to throw light on some of the steps of the apparent passage from peat into some of the varieties of lignite and bituminous coal. Specimens of lignite from Brora in Sutherlandshire; and Rai-Tata on the coast of Otago, New Zealand, were also analysed; as well as of turba, a whitish brown bituminous mineral, found associated with lignite, black shale, and bitumen, in a Tertiary patch at Camamu, on the sea-coast of Bahia, Brazil. It may represent a stage in the passage from bitumen of the oil-shale, gas-coal, and Torbanite minerals.

I am much indebted to my former pupil, Mr T. C. Jamieson, for assisting in the research. The following analyses are proximate, and the sulphur was not determined:—

Table of Analyses of various Coals and Peat Fuels:—(Taylor and Jamieson).

Specimen.	Specific Gravity.	Moisture.	Volatile Matter.	Coke.	Ash.
		per cent.	per cent.	per cent.	per cent.
A. Challeton de Brughat's Peat Fuel,	1·1468	12·90	43·60	43·50	14·30
B. Danchell's Peat Fuel,	1·0904	14·62	41·58	43·80	6·69
C. Lignite from Rai Tata, New Zealand, <i>Scottish Household Coal—</i>	1·2527	16·40	23·89	50·71	5·94
D. Limerigg, Slamannan,	1·2796	2·70	26·53	70·77	2·78
E. Benhar, Linlithgowshire,	1·2753	5·93	21·10	72·15	5·54
F. Lignite from Brora,	1·2307	10·60	26·00	63·40	7·84
G. Clayton's Condensed Peat,	0·7274	11·80	56·56	32·64	2·57
H. Kidd's Carbonised Peat, <i>Seafield Company's Patent Fuel—</i>	0·7059	3·55	50·53	45·92	1·77
I. Specimen No 1—Mixture of Dross Coal and Shale Tar,	1·1197	3·26	35·02	60·92	9·42
J. Specimen No. 2—Mixture of Peat and Tar, . .	0·9986	9·22	49·24	41·54	3·73
K. Turba, an Oil Shale from Bahia, Brazil, . . .	1·1476	10·64	33·66	55·70	43·22

Specimens A and B have the compact, semi-resinous lustre, as well as the other external characters of lignite. They both yield a brown ferruginous ash, approaching in physical appearance that of the bituminous coals D and E.

C, on the other hand, gives a white calcareous ash, resembling those of G and H.

The ashes of F and K have both a whiter appearance than those of the above minerals, and closely approximate to each other.

The ash of I is of a lighter brown than that of J. The colour of the turba, K, in mass, approaches the characteristic yellow streak of the best Torbanite.

The Society's hall on this occasion was heated by the fuel manufactured by the new "Seafield Patent Fuel Company," at their works near Bathgate, and which consists of a mixture of coal-dust or of peat with shale tar, solidified by pressure into large blocks. The fire kindled readily, gave much light and heat, and the fuel lasted a long time.

IV *Note on a Vein of Specular Iron discovered near Clarence River, New South Wales, by the Rev. W. B. Clarke, M.A., F.G.S., Sydney.* By ANDREW TAYLOR, Associate.

V. *Notice of a Bituminous Shale from Waitata, Otago, New Zealand.* By ANDREW TAYLOR. (With Photographs.)

VI. Mr C. W. Peach, A.L.S., Associate, exhibited microscopic sections of the Waitata shale, and remarked that, when preparing these sections, he discovered that the pounded dust of this shale, which is found largely in New Zealand, produced a colouring material resembling sepia. In proof of this, Mr Peach produced several sketches made by himself coloured with this new substitute for sepia, and the excellence of the colouring was the subject of general comment.

The following gentlemen were elected Associates of the Society :—

1. JAMES GEIKIE, F.R.S.E., F.G.S., District Surveyor of the Geological Survey of Scotland.
2. Rev. THOMAS BROWN, F.R.S.E., Carlton Street

Thursday, 26th March 1874.

DAVID MILNE HOME, Esq., of Milnegraden, LL.D., Vice-President, in the Chair.

The following Communications were read :—

I. *On some Silurian Fossils found in the Pentland Hills.* By JOHN HENDERSON, Curator of the Museum.

The first discovery of fossils in the Silurian rocks of the Pentland Hills is due to the labours of a former President of this Society, the able and distinguished geologist Charles Maclaren, who previous to 1849 discovered an *Orthoceratite* near the top of the North Esk. This was all that was known about the fossils