

Family LIMNADIADÆ.

Genus LIMNADIA.

Sp. LIMNADIA ANTILLARUM, nov. sp.

Carapace valves of a rounded oval shape, and of a transparent whitish colour; prominent on dorsal margin where the muscular attachment of the body takes place, sloping from thence rather suddenly towards anterior extremity where it forms a somewhat blunt point, and more gradually to posterior extremity, which, as well as ventral margin, is rounded. Antennules bluntly serrated or crenulated on their upper edge, rather shorter than the peduncles of large antennæ, which are stout and not half the length of the body. They consist of nine articulations, each having one or two long plumose setæ springing from the under edge, and one short stout spine at each joint on the upper edge. Caudal lamellæ of considerable length, and beset on upper edge with long plumose setæ to within a short distance of the tip, which is somewhat curved, sharp-pointed and slightly serrated on upper edge. Feet 18 pairs.

The structure of the carapace is the same as in *Limnadia Hermannii*, the surface being covered with minute dots or puncturations.

This species differs from the two others in the shape of the carapace and in having the setæ of antennæ and tail plumose.

Hab. St. Domingo, West Indies; *M. Sallé*. Mus. Brit.

Genus ESTHERIA.

Sp. ESTHERIA DALLASII, nov. sp.

Carapace valves shortly obovate and flat, upper margin from the beaks to two-thirds of its length almost straight; anterior extremity rather broader than posterior. Beaks prominent and situated near anterior extremity. The shell is of a light horny colour and very thin and translucent. Ribs elevated, smooth and numerous, about 20 in number. The intermediate spaces are concave and are covered all over with rough-looking spots of an irregular size and appearance, approaching somewhat in structure to that of *brasiliensis*. It differs from that species however in size and in being of a more rounded oval shape.

Hab. Brazil? I am indebted for this species to Mr. Dallas, who found it in a collection of insects chiefly from Brazil. Mus. Brit.

BOTANICAL SOCIETY OF EDINBURGH.

June 8, 1854.—Professor Balfour, President, in the Chair.

The following papers were read:—
1. "On the Plants of the Coal Epoch, and on the general Structure of Coal," by Professor Balfour.

After alluding to the importance of studying carefully the Fossil Flora, Dr. Balfour proceeded to make remarks on the structure of the plants connected with the Coal epoch. He particularly noticed

the occurrence of scalariform, pitted, and punctated vessels. He was disposed to think that porous vessels had been in some instances mistaken for true punctated woody tissue, which is characterized by the presence of a circle and a dot in the centre. The presence of *Sigillariæ* and *Stigmaria* in coal, and the conversion of their outer portion into carbonaceous matter, clearly showed that these plants were concerned in the formation of this material. He did not agree with those who supposed that coniferous wood alone formed coal, nor with those who thought that certain rings which appeared on sections of coal parallel to the plane of stratification were the ends of woody tubes. Various plants appear to have joined to form coal, which may account for the differences in the appearance of different parts of the same bed. Specimens were shown of Parrot coal enclosing numerous thin seams of Cherry coal. The extensive fern vegetation of the carboniferous epoch was probably connected with a paucity of other species, and seems to indicate a uniformity of temperature throughout a large area. Many plants, however, which are considered as Ferns, or allied to Ferns, may prove to be Gymnosperms.

True punctated coniferous structure may be seen occasionally in coal, but it must be borne in mind that this tissue occurs in other plants, such as *Winteraceæ*, and that tissue very much resembling it, and apt to be confounded with it, has also been detected in many other orders. Much is still wanting to enable a fossil botanist to speak decidedly in regard to the true nature of many of the coal plants. In many coals evident sporangia have been detected in large quantities. These resemble the spore-cases of Lycopods. In Fordel coal these sporangia are in vast abundance, and they are associated with Middletonite.

The varieties of coal are very numerous. There is a gradual passage from Anthracite to Household and Parrot Coal; and the limit between coal and what is called bituminous shale is by no means definite. Judging by chemical products, as well as by microscopical and other characters, there seems no reason for separating Boghead or Torbane, Capeldrae, Methil, and other brown Parrot coals from the category of true coals. Dr. Fyfe has instituted careful analyses, by which he showed that Boghead Gas Coal and Boghead Household Coal yield the usual coal products, viz. ammoniacal liquor, tar, naphtha, benzole, naphthaline, grease oil, pitch oil, paraffine and pitch. As to bitumen, a matter soluble in naphtha, this exists in very small quantity in coals, and is less abundant in Torbane coal than in English caking coal. Dr. Fyfe states that in—

	Per cent.
Capeldrae coal there is of matter soluble in naphtha .	0·0
Torbane black coal	1·2
Torbane white coal	1·4
Lesmahagow	2·33

While in English caking coal it is 4·2, 5·8, and even 8 per cent.

According to Dr. Fyfe, the following are some of the results as regards volatile matter and coke :—

	per cent.	Coke.
Lancashire coal	26.6	73.4
Boghead coal	69.0	31.0
Wemyss, Capeldrae, Methil		33.41
Methil, upper part of seam	70.5	
Methil, lower part of seam	37.7	

While in Boghead coal the quantity of carbon is small, the quantity of hydrogen is large, and hence there is a small proportion only of fixed carbon left. There is a difference in the quantity of coke according as the coal is heated slowly or rapidly; when the heating is rapid the quantity of coke is smaller. The quantity of white ash left by many coals is very large. This is particularly the case in Lochgelly, Capeldrae, Wemyss, and Torbane coals.

On reviewing all that had been recently done in the examination of coal, Dr. Balfour is disposed to think that there is still a great want of information on the subject, and he particularly alluded to the fact that no chemist had given an analysis of the reddish-brown or yellow matter which is met with in coal, more particularly in Boghead gas coal, and that until this was done it was impossible to decide as to its bituminoid or resinous nature.

Professor Fleming entered at length upon the subject of the formation of coal, and alluded particularly to the differences often observable in strata of the same bed, which he thought indicated a difference either in the materials of which they had been formed, or in the manner in which the deposit had taken place. He heartily concurred in Professor Balfour's views.

Professor Edward Forbes stated that although he had not hitherto taken part in the investigation that had recently occupied so much attention in Edinburgh, he felt that it was one of great importance. He thought a mistake had occurred in regarding coal as a mineral rather than as a rock, and showed that we ought not to confine our ideas of coal to the deposits of the carboniferous system. He particularly alluded to the cretaceous and to other beds of coal found in various parts of the world. He thought Dr. Fleming's views to be nearer the truth than any that had as yet come under his notice. We are very much in the dark as to the real character of many of the fossil plants, and more so in regard to those which have been converted into coal, even if it were necessary to assume that that material was entirely of vegetable origin.

2. "Notice of new localities for rare Plants in the neighbourhood of Edinburgh," by Professor Balfour.

LINNAEAN SOCIETY.

December 20, 1853.—Thomas Bell, Esq., President, in the Chair.

Read, a "Notice regarding a Weevil of the Vine and its Parasite."

By John Curtis, Esq., F.L.S. &c.

Numerous insects have long since been noticed as injurious to vines in the South of Europe, and their history and œconomy have



1854. "Botanical Society of Edinburgh." *The Annals and magazine of natural history; zoology, botany, and geology* 14, 229–231.

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