present, and experimentalists cannot be too much on their guard against the occurrence of these abnormal effects. I think I have done a service to them, especially to those engaged in the delicate investigations of animal electricity, by drawing their attention to the subject.

May 5, 1870.

Lieut.-General Sir EDWARD SABINE, K.C.B., President, in the Chair.

In conformity with the Statutes, the names of the Candidates recommended for election into the Society were read from the Chair, as follows:—

William Froude, C.E.
Edward Headlam Greenhow, M.D.
James Jago, M.D.
Nevil Story Maskelyne, M.A.
Maxwell Tylden-Masters, M.D.
Alfred Newton, M.A.
Andrew Noble, Esq.
Capt. Sherard Osborn, R.N.
Rev. Stephen Parkinson, B.D.
Capt. Robert Mann Parsons, R.E.
William Henry Ransom, M.D.
Robert H. Scott, Esq.
George Frederic Verdon, C.B.
Augustus Voelcker, Ph.D.
Samuel Wilks, M.D.

The Bakerian Lecture was delivered by John W. Dawson, LL.D., F.R.S., &c., Principal and Vice-Chancellor of M'Gill College, Montreal, "On the Pre-Carboniferous Floras of North-Eastern America, with especial reference to that of the Erian (Devonian) Period." The following is an Abstract.

The attention of the author was first directed to the Devonian as distinguished from the Carboniferous flora by the discovery, on the part of Sir W. E. Logan, in 1843, of some remarkable remains of plants in the Sandstones of Gaspé, Canada. In 1859, after visiting Gaspé to study these plants *in situ*, the author published descriptions of them, and more particularly of the two characteristic Lower-Devonian genera *Prototaxites* and *Psilophyton*, in the Journal of the Geological Society.

Subsequently additional material was obtained by personal investigation of the Devonian of Maine and New Brunswick, and, through the kindness of Prof. James Hall, from that of New York. These additional plants were also published in the Journal of the Geological Society.

Still more recently, a thorough re-examination of the Gaspé beds, the systematic exploration of the plant-bearing beds near St. John by Prof. Hartt, and fresh collections made by Prof. Hall have enabled the author to prepare a catalogue of 121 species, and to attempt a thorough revision

of the Erian flora, and an investigation of its conditions of growth and relations to the Carboniferous flora.

The term "Erian" is applied to the formations included between the top of the Upper Silurian and the base of the Carboniferous, on account of the uncertainties which have attended the subdivision and limitation of the Devonian of Europe, and also on account of the immense area occupied by these beds on the south and west of Lake Erie, and their admirable development with regard to subdivisions and fossils. The name "Erie Division" was also that originally applied to this typical series by the geologists of the Survey of New York.

A large part of the paper was occupied with the revision of the Erian flora, including the description of twenty-three new species, and more ample descriptions of others previously known only in fragments. Large trunks of *Prototaxites*, from the base of the Lower Devonian, were described, and full details given of the form, structures, and fructification of two species of *Psilophyton*. The new genus *Ormoxylon* was described. The genus *Cyclostigma* was noticed, as represented by two species in America, and its foliage and fruit described for the first time. The genera of the Erian Ferns were examined and corrected, and several interesting trunks and stipes belonging to Tree-ferns were described. The fruits of the genus *Cardiocarpum* were illustrated with reference to their structure. The occurrence of *Lepidophloios*, *Calamodendron*, and other forms in the Middle Devonian was noticed for the first time.

The third part of the memoir was occupied with comparisons and general conclusions. At the close of the Upper-Silurian period there was a great subsidence of the land in Eastern America, proved by the wide extent of the marine beds of the Lower Helderberg (Ludlow) group. It was on the small areas of Lower-Silurian and Laurentian land remaining after this subsidence that the oldest land plants known in the region flourished. Re-elevation occurred early in the Devonian period, and the known flora receives considerable extension in the shallow-water beds of the Lower Erian. The subsidence indicated by the great Corniferous limestone interrupted these conditions on the west side of the Appalachians, but not on their eastern side. At the close of this we find the rich Middle-Devonian flora, which diminishes toward the close of the period; and, after the physical disturbances which on the east side of the Appalachians terminated the Erian age, it is followed by the meagre and quite dissimilar flora of the Lower Carboniferous; and this, after the subsidence indicated by the Carboniferous limestone, is followed by the Coal-formation flora.

If we compare the Erian and Carboniferous floras, we find that the leading genera of the latter are represented in the former, but, for the most part, under distinct specific forms, that the Erian possesses some genera of its own, and that many Carboniferous genera have not yet been recognized in the Erian. There is also great local diversity in the Erian flora, conveying the impression that the conditions affecting the growth of

plants were more varied, and the facilities for migration of species less extensive, than in the Carboniferous.

In comparing the Erian flora of America with the Devonian of Europe, we meet with the difficulty that little is known of the plants of the Lower and Middle Devonian in Europe. There are, however, specimens in the Museum of the Geological Survey which show, in connexion with facts which can be gleaned from the works of continental writers, that *Psilophyton* occupied the same important place in Europe which it did in America; and in the Upper Devonian the generic forms are very similar, though the species are, for the most part, different.

In Eastern America no land flora is known below the Upper Silurian; and even in that series the plants found are confined to the genus *Psilophyton*. Independently, however, of the somewhat doubtful Lower-Silurian plants stated to have been found in Europe, there are indications, in the Lower-Erian flora, that it must have been the successor of a Silurian flora as yet almost unknown to us; and the line of separation between this old flora and that of the Devonian proper seems to be at the base of the Middle Devonian.

In applying these facts and considerations to the questions relating to the introduction and extinction of species, and the actual relations of successive floras, it was proposed to compare what might be called specific types,—that is, forms which in any given period could not be rationally supposed to be genetically related. Of such specific types, at least fifty may be reckoned in the Erian flora; of these, only three or four are represented in the Carboniferous by identical species, while about one half are represented by allied species. The remainder have no representatives.

A Table of specific types of the Erian was given, and its bearing shown on the questions above referred to; and the hope was expressed that by separating such types from doubtful species and varietal forms, some progress might be made towards understanding, at least, the times and conditions in which specific types were introduced and perished, and the range of varietal forms through which they passed.

Presents received April 7, 1870.

Transactions.

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