

*Diploxylon* stems from Halifax and Oldham, and the *Lepidodendroid* stem from Burntisland, shows that the primary xylem becomes broader in this series of forms. The polar groups of small elements, which still form strongly prominent teeth on the surface of the corona in the stems from Halifax and Oldham, are considerably reduced in the Burntisland plant, just as in *Lepidodendron selaginoides*. The leaf-trace, which is still given off from the middle of a sinus in the Halifax and Oldham stems, arises laterally, in relation to the teeth of the corona, in the Burntisland stem, approaching *Lepidodendron selaginoides* in this point also. The secondary wood of the Burntisland form shows no indication of any differentiation of the secondary wood into segments or arcs corresponding to the sinuses and teeth of the primary wood. In fact, certain English types of *Diploxylon* only accentuate the differences which separate the Haidinghen *Sigillaria* from *S. spinulosa*.

The central axis of the ribbed *Sigillaria* differs from that of the Phanerogamic type in the manner of origin of the leaf-traces and in the structure and centripetal development of the primary xylem; these structural features characterize the radial form of vascular axis, and are in short those of a well-defined Cryptogamic type.

**THE JURASSIC FLORA OF BRITAIN**<sup>1</sup>.—The Jurassic plant-bearing strata exposed in the cliff sections of the Yorkshire coast, between Whitby and a few miles south of Scarborough, have afforded unusually rich data towards a restoration of the characteristics and composition of a certain facies of Mesozoic vegetation. Since the publication of A Geological Survey of the Yorkshire Coast, by Young and Bird, in 1822, the numerous species of Inferior Oolite plants from Gristhorpe Bay, Scarborough, Cloughton Wyke, Haiburn Wyke, Whitby and other localities have been described by Phillips, Brongniart, Lindley and Hutton, Morris, Göppert, Leckenby, Saporta, Zigno, Nathorst, Carruthers and other writers, but no detailed account of the flora has been published. The names of Bean, John Williamson, his son William Crawford Williamson, Phillips, Murray, Leckenby and others will always be closely associated with the earlier investigations of the fossil flora of east Yorkshire. The British Museum unfortunately possesses but few of the type-specimens of these Jurassic plants;

<sup>1</sup> Read before the Botanical Section of the British Association, Dover, Sept. 1899.



some appear to have been lost, but several have been recognized in the Museums of Cambridge, Scarborough, Whitby, York, Newcastle, Paris and elsewhere.

The Author has been engaged during the last few years in examining the Yorkshire Inferior Oolite Species, and an account of the flora—to be published as a British Museum Catalogue—is now passing through the press. The determination of the species is in nearly all cases based on the external characters, as the conditions of preservation were unfavourable for the petrification of the internal tissues. Cycadean plants are especially numerous, being represented by some species which must be classed with the Bennettiteae and by others of which the exact position cannot be definitely determined. The Ginkgoaceae include species of the genera *Ginkgo* and *Baiera*, while *Brachyphyllum mamillare* Brongn., and *Pagiophyllum Williamsoni* (Brongn.) may be mentioned as two of the more abundant Conifers.

Among the ferns there are examples of the Matonineae, Schizaeaceae, Osmundaceae, Cyatheaceae, and other families, and *Equisetites columnaris* Brongn. and *Lycopodites falcatus* L. and H. represent the Equisetaceae and Lycopodiaceae respectively. A few more or less unsatisfactory fossils have been referred to the Bryophyta and Thallophyta. The absence of any Monocotyledons and Dicotyledons is a striking feature, while the flora as a whole presents a marked agreement with floras of Rhaetic and Lower Jurassic age described from various European and extra-European localities. The following list may serve as a guide to the nature of the vegetation which existed in the North-West of Europe during the latter part of the Jurassic Epoch:—

BRYOPHYTA: *Marchantites erectus* (Leck.).

EQUISETACEAE: *Equisetites columnaris* Brongn., *E. Beani* (Bunb.).

LYCOPODIACEAE: *Lycopodites falcatus* L. and H.

FILICINEAE: *Matonidium Goepperti* (Ett.), *Lacopteris polypodioides* (Brongn.), *L. Woodwardi* (Leck.), *Todites Williamsoni* (Brongn.), *Klukia exilis* (Phill.), *Ruffordia Goepperti* (Dunk.), *Coniopteris Hymenophylloides* (Brongn.), *C. quinqueloba* (Phill.), *C. arguta* (L. and H.), *Dictyophyllum rugosum* L. and H., *Cladophlebis lobifolia* (Phill.), *C. denticulata* (Brongn.), *C. haiburnensis* (L. and H.), *Taeniopteris vittata* (Brongn.), *T. major* L. and H., *Sphenopteris princeps* Presl., *S. Murrayana* (Brongn.), *S. Williamsoni* Brongn., *Sagenopteris Phillipsi* (Brongn.).



CONIFERAE: *Cryptomerites divaricatus* Bunb., *Cheirolepis setosus* (Phill.), *Araucarites Phillipsi* Carr., *Taxites zamioides* (Leck.), *Brachyphyllum mamillare* Brongn., *Pagiophyllum Williamsoni* (Brongn.), *Czekanowskia Murrayana* (L. and H.), *Nageiopsis anglica*, sp. nov.

GINKGOACEAE: *Ginkgo digitata* (Brongn.), *G. Whitbiensis* Nath., *Baiera Lindleyana* (Schimp.), *B. gracilis* Bunb., *B. Phillipsi* Nath., *Beania gracilis* Carr.

CYCADALES: *Williamsonia gigas* (L. and H.), *W. Pecten* (Phill.), *Otozamites Beani* (L. and H.), *O. acuminatus* (L. and H.), *O. graphicus* (Leck.), *O. Bunburyanus* Zign., *O. obtusus* (L. and H.), var. *oolitica*, *O. Feistmantelli* Zign., *O. parallelus* Phill., *Dioonites*, sp., *Nilssonina compta* (Phill.), *N. mediana* (Leck.), *N. tenuinervis* Nath., *Anomozamites Nilssoni* (Phill.), *Ptilozamites Leckenbyi* (Leck.), *Ctenis falcata* L. and H., *Podozamites lanceolatus* (L. and H.), *Pachypteris lanceolata* Brongn.

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**A NEW GENUS OF PALAEOZOIC PLANTS**<sup>1</sup>.— The following description is based on the examination of ten sections prepared from a fragment of stem in the Binney Collection (Woodwardian Museum, Cambridge). The type-specimen occurs in a calcareous matrix associated with the shells of *Goniatites*, and was originally obtained from the Lower Coal-Measures of Lancashire; it consists of a cylinder of secondary xylem, 2 cm. in breadth, enclosing a central region, 1.9 cm. in diameter, occupied by primary xylem. The wide primary stele is made up chiefly of groups of unusually large tracheids with their walls covered with bordered pits, associated with thin-walled parenchyma; the tracheids are characterized by their isodiametric or horizontally elongated form, while a few are distinguished by their greater length. In the peripheral region of the primary stele the tissue assumes various forms; the large short tracheids and parenchyma extend in places close up to the inner edge of the secondary wood, but more or less compact groups of narrower and longer tracheids occur here and there in the peripheral zone and constitute leaf-traces.

<sup>1</sup> Read before the Botanical Section of the British Association, Dover, Sept. 1899. For a more complete account of the genus *vide* Proceedings of the Cambridge Philosophical Society, Vol. x, Part III, p. 158, 1899.



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