NOTES.

THE STRUCTURE AND AFFINITIES OF MATONIA PECTINATA [1].—By A. C. Seward, F.R.S., University Lecturer in Botany, Cambridge. The genus *Matonia* has long been known as an isolated type among existing Ferns. It is represented by two species, *M. pectinata* R. Brown and *M. sarmentosa* Baker, both confined to the Malayan region. *Matonia* has not hitherto been examined anatomically, and its reference by several writers to an intermediate position between the Cyatheaceae and Gleicheniaceae, is based on the structure of the sorus, which, in the small number of the sporangia and in its circular form, resembles that of the latter family, while the presence of an indusium and the position of the annulus afford connecting links with Cyatheaceous Ferns.

In *Matonia pectinata* the frond has a characteristic pedate habit, with numerous long pinnae having slightly falcate linear segments, practically all of which appear to be fertile. The sori are circular in form and indusiate, each consisting of about eight large sporangia with an oblique incomplete annulus, containing sixty-four tetrahedral spores. The dichotomously branched rhizome, which grows on the surface of the ground, is thickly covered with a felt of multicellular hairs, and gives rise to long-stalked fronds from its upper face, and a few wiry roots which may arise from any part of the surface of the stem.

The full paper deals more especially with the anatomical structure of *Matonia pectinata*. The material which rendered the investigation possible, was generously supplied by Mr. Shelford of the Sarawak Museum, Borneo, to whom the author wishes to express his hearty thanks.

The stem is polystelic, and of the gamostelic type; there may be two annular steles, with the centre of the stem occupied by ground-tissue; or in shorter branches of the rhizome a third vascular strand may occupy the axial region. Each stele consists of xylem-tracheids

[1] Abstract of a paper read before the Royal Society, March 9, 1899.

and associated parenchyma, surrounded by phloem composed of large sieve-tubes with numerous sieve-plates on the lateral walls, and phloem-parenchyma; an endodermis and pericycle surround each stele, and in the case of the annular steles these layers occur both internally and externally. At the nodes the outer annular stele bends up into the leaf-stalk, and a branch is also given off from the margin of a gap formed in the inner annular stele; the axial vascular strand may or may not be in continuity with the meristele of the leaf. The petiole is traversed by a single stele, similar in shape to that of certain Cyatheaceous Ferns; towards the top of the leaf-stalk the stele alters its form, and gradually gives off separate U-shaped branches to supply the pinnae.

The most interesting feature in the structure of the pinnules is the marked papillose form of the lower epidermal cells. The roots have a triarch stele enclosed by a few layers of thick brown sclerous cells.

In structure *Matonia pectinata* presents points of agreement with several families of Ferns, on the whole approximating more closely to Cyatheaceae than to any other family; but the peculiarities are such as to fully confirm the conclusion previously drawn from external characters that *Matonia* should be placed in a separate division of the Filices.

After comparing the structure of the Malayan species with that of other genera, the paper concludes with an attempt to give an account of the geological history of the Matonineae. The genera *Laccopteris* and *Matonidium* are dealt with at some length, and reference is made to other Mesozoic Ferns, which may probably be included in the same group.

The data furnished by an examination of palaeontological evidence lead to the conclusion that in *Matonia* we have a survival of a family of Ferns, now confined to a few localities in Borneo and the Malay peninsula, and represented by two living species, which in the Mesozoic epoch had a wide geographical range, being especially abundant in the European area.

STUDIES IN THE MORPHOLOGY OF SPORE-PRODUCING MEMBERS: IV. LEPTOSPORANGIATE FERNS.—By F. O. Bower, Sc.D., F.R.S., Regius Professor of Botany in the University of Glasgow[1]. The characters used in current classifications

[1] Abstract of a paper read before the Royal Society, April 20, 1899.