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*Cycadofilices*, *Pteridosperms* and *Botryopteris* occur, there is no satisfactory evidence of the existence of a true fern on this horizon. In the succeeding *Westphalian series*, true ferns possibly exist in such genera as *Hymenophyllites*, *Oligocarpia*, *Senftenbergia*, and *Kidstonia*. Also the *Marattiaceæ* are present in *Asterotheca* and some allies. In the *Radstockian series* and *Upper Coal Measures* of the continent, all these groups are probably present, but the *Marattiaceæ* assume here a very important place.

The conclusion is, therefore, come to that the *Cycadofilices*, which long antedated the advent of true ferns, cannot have been derived from them but are themselves the oldest type of fern-like plant at present known. In regard to the true ferns it seems probable that they may have been derived from the *Botryopterideæ*.

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*Some Observations on Welwitschia mirabilis, Hooker, f.*

By H. H. W. PEARSON, M.A., F.L.S., "Harry Bolus" Professor of Botany in the South African College, Cape Town.

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(Abstract.)

The material examined was obtained by the author from plants of *Welwitschia* growing near the German military station at Haikamchab, on the south bank of the Swakop River, 31 miles north-east of the British station at Walfish Bay. Owing to the native rising, it was impossible to carry out the intention of spending some weeks in the country, and keeping plants under constant observation. The results recorded are, therefore, based on the investigations of flowers collected during a hurried visit to the *Welwitschia* country.

The author deals with the habitat of the plants, and describes the climatal conditions under which they grow. Evidence is adduced in support of the view that *Welwitschia* is partially, if not entirely, insect-pollinated, and that the processes of fertilisation and maturation of the seed seem to be effected much more rapidly than in other *Gymnosperms*.

*Male Flowers*.—The author supports Strasburger's view that the male flowers are reduced forms of an originally hermaphrodite structure. The development of microsporangia and microspores is described. The characters of the pollen-grain, in which three nuclei were observed before the dehiscence

of the anthers, are considered to indicate a closer relationship between *Welwitschia* and *Gnetum* than between *Welwitschia* and *Ephedra*.

*Female Flowers.*—Observations are recorded on the development of the macrosporangia and macrospores; the nature of the prothallial tubes is discussed, and the conclusion is that the true interpretation of the extraordinary behaviour of the fertile end of the *Welwitschia* prothallus will be founded upon a comparison with the corresponding portion of the embryo-sac of *Gnetum gnemon*.

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*The Araucariæ, Recent and Extinct.*

By A. C. SEWARD, F.R.S., Fellow of Emmanuel College, and SIBILLE O. FORD, formerly Bathurst Student of Newnham College, Cambridge.

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(Abstract.)

The paper includes the following sections:—

I. *Introduction.*—The work was undertaken primarily with a view to ascertain whether the genera *Agathis* and *Araucaria* exhibit any of those features which are often associated with survivals from the past; our aim was to obtain an answer to the question: Do the existing *Araucariæ* afford evidence of primitive characters or do they throw light on the phylogeny of the *Araucarian* phylum?

II. *Distribution.*—A brief account is given of the present distribution of existing species. *Agathis* is for the most part an island type. *Araucaria* is met with in the same area as that occupied by *Agathis*, but occurs also in Chili, S. Brazil, and Bolivia; the most widely spread species—*A. Cunninghamii*—extends over an area 900 miles long in Queensland and New South Wales, and is recorded from New Guinea. Five species of the genus have been described from New Caledonia.

III. *Generic Diagnosis and Synonymy of Species.*—In this section an attempt is made to give a concise account of the more striking characteristics of each species with a list of references to descriptions and records of the several types.

IV. *Seedlings.*—The seedlings described belong exclusively to the genus *Araucaria*; those of *A. Bidwillii* and *A. imbricata*, characterised by the swollen food-storing hypocotyl, are described in detail. In one case the stele