

with an oval cup-shaped body about 8 inches in length and 4 inches in breadth, with a sieve-net on the upper truncated surface of the sponge body, extending evenly over the oscular opening and over the layer of the "spiculate cruciform spicules" in the net beams. We may further add that there were to be found in the Museum at Lisbon nearly a dozen specimens of *Hyalonema* which were taken at Setubal. "Most of them were preserved in spirits of wine; they were certainly the very finest collection of this remarkable Sponge in Europe. The largest had a stem about 18 inches in height; there were no parasites of any kind on it, and it was furnished with a sponge mass some 8 inches in diameter, and nearly as much in height. A second specimen was very curious, for here two apparently distinct individuals had become matted together: the two glass ropes were interlaced, and the two sponge masses had grown together" (Proc. Dublin Nat. Hist. Soc., vol. v., 1869). It would have been most important to have had the opinion of such an authority as Prof. Schulze as to whether all these specimens from Setubal are referable to Bocage's species; and whether, as we venture to think, Marshall's *H. thomsoni* may not be only a well-marked variety thereof. It is possible that by thus calling attention to the subject we may yet learn more of the treasures of the Museum of Lisbon, and nothing in these remarks can in the very slightest degree detract from the merits and importance of this splendid contribution to our knowledge of the vitreous Sponges. E. P. W.

THE FERN-ALLIES.

Hand-book of the Fern-Allies: A Synopsis of the Genera and Species of the Natural Orders Equisetaceæ, Lycopodiaceæ, Selaginellaceæ, Rhizocarpeæ. By J. G. Baker, F.R.S., F.L.S., First-Assistant in the Herbarium of the Royal Gardens, Kew. (London: George Bell and Sons, York Street, Covent Garden, 1887.)

AS the author states in the preface, "The present Hand-book is planned upon the same lines as Hooker and Baker's 'Synopsis Filicum,' and the two, taken in connection, cover the whole series of the Vascular Cryptogamia." The total number of species described in the "Hand-book" is 566, and as we may now place the number of known ferns at about 3000, the fern-allies may be taken to represent about one-seventh of the recent Vascular Cryptogams. The fern-allies include only eleven genera, and about four-fifths of the species belong to the two genera *Selaginella* (335 species) and *Lycopodium* (94 species). The eleven genera are placed by Mr. Baker in four "natural orders," while the Filices form a fifth: three of these, Filices, Equisetaceæ, and Lycopodiaceæ, being isosporous; and two, Selaginellaceæ and Rhizocarpeæ, being heterosporous. In this way the relationship of the Rhizocarpeæ to the ferns is quite lost sight of; the Selaginellas and Lycopods are separated more widely than is desirable, and no place is left for the fossil heterosporous Equisetinæ. The arrangement adopted by Mr. Baker is very good for herbarium work; but for classificatory purposes it ignores certain palæontological facts which we cannot at the present day afford to overlook. Mr. Baker, however, does not deal with the fossil types, and now that we have such a complete account of the recent forms, let us hope that before long we may have as

complete a synopsis of the fossil forms; a work which would be of the greatest interest and importance.

In regard to the geographical distribution of the fern-allies it is interesting to notice that *Equisetum*, *Isoetes*, and *Pilularia* predominate in the North Temperate Zone. *Lycopodium*, *Psilotum*, *Selaginella*, *Salvinia*, and *Marsilea* are eminently tropical; and *Phylloglossum* is peculiar to the South Temperate Zone. Like the ferns, the fern-allies are best developed in the Tropics; and in the Tropics we also find the greatest number of peculiar species. Thus, out of the 566 species, 484 are met with in the Tropics of the Old and New World; and no less than 402, or 83 per cent., of these are peculiar to the Tropics. As with the ferns so also with the fern-allies; tropical America is richest in species, including 237 species, of which 212 are peculiar. The Southern Temperate Zone yields only 83 species, of which 42, or 51 per cent., are peculiar, the fern-allies being thus much less numerous than the ferns in the southern flora. In the North Temperate Zone 150 species are met with, and of these 48, or 32 per cent., are peculiar. The North Temperate Zone is thus, like the South, deficient in fern-allies as compared with ferns, and this is apparently due to the small number of fern-allies as yet reported from temperate Asia. Only 6 species occur in the Frigid Zone, and, like the ferns, represent about 1 per cent. of the whole, none of the species being peculiar.

It is difficult to realize the amount of labour and research that must have been spent upon the production of this book; but anyone who has attempted to study the genus *Selaginella* will appreciate the masterly manner in which Mr. Baker has dealt with the 335 species of the genus, more than one-fourth of which he has himself described for the first time. Most of the species of Selaginellaceæ and Rhizocarpeæ have been described by Mr. Baker in his papers on the subject which have appeared from time to time, since 1883, in the *Journal of Botany*, but several new species are described in "Fern-Allies" for the first time, recent additions to the rich treasures of Kew. It is to be regretted that Mr. Baker does not more particularly refer to his papers in the *Journal of Botany*, and it is hard to understand why, in the descriptions of *Marsilea concinna* and *M. condensata*, he has omitted the references to the *Journal of Botany*, 1886, pp. 179 and 281 respectively. Then in transferring the matter from the *Journal of Botany* he has altogether dropped out the habitat of *Azolla nilotica*. There are also in the book not a few misprints, and a want of care is shown in numbering and lettering the sections of *Selaginella*. The index is also not quite up to the mark, as in *Marsilea*, with numerous synonyms omitted, and the misprints in *Pilularia* and *Psilotum*. As the index of the "Synopsis Filicum" was published separately as a catalogue of ferns, we may perhaps be permitted to express a hope that this index will not be so published until it is carefully revised. All that is wanting, however, is only a little more careful editing, and the few faults in no way detract from the sterling value of the work.

As the only modern synopsis of the group, it is a work that must be in the hands of every botanist who deals with the Vascular Cryptogams, and it will be a lasting monument to Mr. Baker's critical accuracy and great power of dealing with a difficult set of plants. W. R. MCNAB.