

REVIEWS.

Lehrbuch der Allgemeinen Pflanzengeographie.
Graebner. P. 2 umgearbeitete Auflage. xii and 320 pages (illustrated).
Leipzig. Quelle und Meyer. 1929. 14-80 Marks.

Plant Geography, in its wider sense, is claiming increasingly greater attention from all students of Botany. This is reflected in the increasingly greater output of work, both in the form of original papers as well of books, which is being published from time to time. To this growing literature the present work is a useful addition. It makes, however, a very agreeable departure from the beaten track followed by most of the published treatises on this subject so far. These latter have in the main—if indeed not exclusively—devoted their attention either only to the floristic side or to the ecological aspect. Even then hardly any of them have attempted to draw upon the large resources of other branches such as Palaeobotany, General Biology, etc. The result has been a very lop-sided presentation, lacking co-ordination and perspective, and generally devoid of that stimulating feature which can only be imparted by its fuller treatment, as a part of, and standing in close relation to, the other branches of Botany.

The present book avoids this general but faulty practice. It combines in itself the useful features of the usual method of treatment with a clear indication of the correlation that the described facts have to the other branches. In this way emerges a complete picture of the organic whole, and the result is a pleasing and readable book.

The text is divided into three sections. Preceding these is a short introduction. This gives an historical sketch of the development of Plant Geography. Then follows a general account of the development of the plant world through the geological times, interpreted with the help of palaeobotanical records, and this is continued into an account of the development of the existing type of vegetation. The author shows clearly in a limited space how, starting with small beginnings in the far-off geological ages, almost in a monotonous uniformity, the vegetation has continued to vary in form and distribution in response to the operation of external factors, the most potent of which, according to the author, has been the climate. In this section the author has pressed into service the results of researches into all phases of Botany. During the course of the treatment he refers to and attempts to explain many interesting biological facts connected with the evolution and distribution of plants. Such, for example, are the evolutionary sequence of the somatic and reproductive organizations, biological interpretation of variations, origin of species, inheritance of acquired characters, origin of angiospermy and of the hermaphrodite

flower, etc., etc. Besides these are also treated changes of climate and relative areas of land and water during geological ages and the facts and causes connected with the geographical distribution of plants.

The second and the third sections are devoted respectively to the floristic and the ecological plant geography. The former treats of the usual topics of the floral regions and the floral provinces, the chief vegetational and climatic features of which are briefly set forth. In the latter the author first deals with the various classes of factors now operating to transform the existing vegetation, viz., the climatic, the edaphic and the biotic. The treatment of the last is very meagre and fails to convey a just appreciation of the influence of these on the changes induced on vegetation. The activities of the animals and chiefly of man are treated under the "miscellaneous" factors and disposed of in a few paragraphs. Finally, there is an account of the various terrestrial and aquatic 'formations.'

There are numerous clear drawings and photographs, though some more, such as those depicting the characteristic desert landscapes and aquatic associations could, with advantage, have been included. There is a copious citation of literature in the form of footnotes. There, however, appears to be no mention of Willis's work. *Elodea* is throughout referred to by its less commonly known name of *Helodea*.

The basic idea in the preparation of the book, says the author in the preface, has been not to make the all-embracing subject of plant-geography appear as a confused mass of memory lumber and of otherwise dry details, but to relate the existing plants to their previous history and to the forces now in operation, so that the whole may appear as a sound system. In this the author has amply succeeded, and one may express with him the hope that the book may gain friends and may succeed in bringing back those who, through dry and one-sided treatment, have become alienated from this interesting and absorbing subject.

N. K. T.

Haines, H. H., C.I.E., F.C.H., F.L.S. *The Botany of Bihar and Orissa*. Part I, Superintendent, Government Printing, Bihar and Orissa, pp. x and 199, 1925. Rs. 8.

Mr. Haines, who had some years before published his *Forest Flora of Chota Nagpur*, had subsequently undertaken a much more comprehensive work on the flora of the whole province of Bihar and Orissa. This was completed some years ago. The six parts that compose it were published from time to time, the last to be published being the first part. This contains a general introduction to the vegetation of the province together with a conspectus of the orders and families, as well as a glossary.

The work is a very welcome addition to the list of local Indian floras specially as it deals with a province which so far had remained very imperfectly and incompletely worked out. Besides, so far as the introduction and the general treatment specially are concerned, it makes a new departure in the method of treatment so far prevalent.

The writers of the vast majority of the hitherto published floras have either totally dispensed with an introduction or have been content with providing merely poor, sketchy substitutes. When the object to be achieved was merely collection and naming of plants, such floras served their purpose, but with the increasing attention now being paid to correlate the vegetation to the environic conditions and to work out the many interesting problems connected with the distribution and spread of the species, it has become absolutely necessary to deal also with the main ecological features of the area in order to provide a proper setting for the material and data to be handled, and to enable others to have an intelligent grasp of the subject. It is, therefore, a great satisfaction to find that all these considerations have been kept sufficiently clearly in mind by the present writer.

The earlier part of the introduction is devoted to such topics as the topography, geology and climate. The author has here brought together much important information and many useful data otherwise found only widely scattered in many miscellaneous works. This is followed by an account of the general character of the flora. This includes both the floristic and the ecological aspects of the three tracts into which the province is divided, *viz.*, the Northern, the Central and the Southern. Besides many ecological and plant geographical observations, this part has a specially useful section dealing with the habitats of plant communities, with the more striking or characteristic species of each habitat mentioned. The author advances reasons for dealing with vegetation according to habitats rather than by classifying plant associations, which latter has so far been the prevalent method. There is no doubt that in several respects the author's method is much more convenient.

Another useful feature is a chapter on taxonomy and classification. Here the author briefly reviews the more recent views on the phylogeny and classification of plants, giving a somewhat fuller treatment of the Angiosperms. He generally accepts Arber and Parkin's view of the origin of this group and therefore begins the synopsis of the families with the Ranales. For the sake of practical convenience, however, he follows Bentham and Hooker's arrange-