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TREE-FLORA OF JAVA.

Mikrographie des Holzes der auf Java vorkommenden Baumarten. By Dr. J. W. Moll and H. H. Janssonius. Erste Lieferung (1906), pp. 368; and Zweite Lieferung (1908), pp. 369–568+160. (Leyden: E. J. Brill.) Price 6 marks each.

THIS work, like the earlier tree-flora of Java, was undertaken at the suggestion of Prof. M. Treub, director of the Botanic Garden at Buitenzorg. It will be convenient to begin by making a short reference to this earlier publication.

In the year 1888 Dr. S. H. Koorders began to collect material for a tree-flora of Java. The work connected with the compilation of this flora was carried out in a most careful and methodical manner. More than four thousand trees, many of which were in the primeval forest, were marked, and a special system of numbering the trees, and of indexes and maps, was instituted, so that each tree could be easily found again, and the rate of growth, leaf fall, &c., could be studied. In the course of naming and studying the plants for the tree-flora of Java ("Flora arborea Javanica," by S. H. Koorders and Th. Valeton), a collection of fifteen thousand specimens was made to illustrate the species dealt with in the flora.

This collection included a series of wood-specimens, which were sent in 1904 from Buitenzorg to the University of Gröningen for microscopic examination and description, and this work has been carried out, under the direction of Prof. J. W. Moll, by Herr H. H. Janssonius. The results appear in the present work, which may therefore be described as a counterpart to Koorders and Valeton's flora in the province of the anatomy of the wood. Hence a most important asset in the value of the work lies in the fact that there is no uncertainty as to the origin of the specimens. They have all been obtained from trees which have been carefully studied and determined by an expert, and, moreover, herbarium material from the same trees is to be found in the herbaria at Buitenzorg, Leyden, Berlin, &c.

In this work the authors have adopted a very orderly arrangement of the information. Under each species there are five principal headings, beneath which are given the literature, information on the material, the preparations made, the reagents used, and, lastly, under the name of micrography, a description of the structure of the wood. The section on micrography is generally subdivided into one on topography, dealing chiefly with the distribution of the tissues and elements as seen in transverse section, and another giving descriptions of the individual elements, based on a study of radial, tangential, and transverse sections, sometimes supplemented by macerated preparations. A separate paragraph is devoted to each kind of element, and gives full details of measurements, pitting, contents, &c. The section on topography is elucidated, in cases where this is advisable, by means of a diagrammatic figure showing the distribution of the vessels, wood-parenchyma, medullary rays, &c., in a portion of a transverse section. When several species of a genus are found to differ only slightly in the structure of the wood, one of them is fully described, and the description of the others is shortened by comparative treatment. Under each family, except where only one species is dealt with, there is a description of the structure of the wood, founded on that of the different species described, and an analytical key for distinguishing the species, so far as this is possible by means of the wood, is added.

Part i. contains, first (pp. 5–62), general information, including the history of the material and an exposition of the method adopted in presenting the information in the succeeding pages. The remainder of part i. (pp. 63–368) is occupied by the description of the microscopic structure of the wood in species from Dilleniaceæ to Dipterocarpaceæ. Part ii. (pp. 369–547) continues the same from Dipterocarpaceæ to Tiliaceæ, followed by the index and contents of vol. i., after which pp. 1–160 form a first instalment of vol. ii., extending from Geraniaceæ to Meliaceæ. The last page of part ii. reaches species No. 230, twenty-one families having been dealt with up to this point.

The foregoing description of this work will serve to indicate its value, which lies in the authentic nature of the specimens, the large number of species and families dealt with, the completeness of the description of the microscopic structure, and, lastly, the strict uniformity of treatment adhered to by the authors.

This book will be an important aid in the determination of wood-specimens, and the authors are to be congratulated on the efficient way in which they are carrying out a difficult and laborious task.

L. A. B.

TWO AMERICAN MATHEMATICAL BOOKS.

(1) *Plane and Spherical Trigonometry and Four-place Tables of Logarithms.* By Dr. Wm. A. Granville. Pp. xii+264+38. (London: Ginn and Co., n.d.) Price 5*s.* 6*d.*

(2) *A Course of Mathematics for Students of Engineering and Applied Science.* By Fredk. S. Woods and Fredk. H. Bailey. Vol. II. Pp. xii+410. (London: Ginn and Co., n.d.) Price 10*s.* 6*d.*

(1) THE type and diagrams in this book are models of elegance and excellence; evidently no pains have been spared in making both as clear and perfect as possible, and the logarithm tables at the end of the book add greatly to its completeness. One useful feature in them is the table of circular functions with the angles expressed in degrees and decimals of a degree, in addition to the usual table in degrees and minutes. The author also supplies a neat celluloid combined protractor and scale in a pocket attached to the cover.

In the plane trigonometry the author introduces the student to practical examples in connection with right triangles in the first chapter, but does not proceed to the solution of oblique triangles until chapter vii., after discussion of functions of the generalised angle, the addition theorems, inverse notation, and trigonometric equations, but to a certain extent teachers can choose their own order in taking these chapters.

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