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MANIHOT RUBBER.

Der Manihot-Kautschuk. Seine Kultur, Gewinnung und Präparation. By Prof. A. Zimmermann. Pp. ix+342. (Jena: Gustav Fischer, 1913.) Price 9 marks.

THE subject of rubber cultivation is one which has received much attention during recent years. Hitherto the Middle East has confined its attention almost entirely to the cultivation of *Hevea brasiliensis*, rather than that of Manihot, which is the subject of Dr. Zimmermann's book. Manihot is not regarded in the Middle East as being so profitable to cultivate as *Hevea brasiliensis*, but it certainly takes a very high place among the arborescent forms of rubber-yielding plants in virtue of its rapid rate of growth, its hardy characteristics, and quality of rubber.

Four species are dealt with by the author, viz., *Manihot Glaziovii*, Müll. Arg.; *M. dichotoma*, Ule; *M. piuhyensis*, Ule; *M. heptaphylla*. The first species is that which has been most largely distributed throughout the tropics, and is the source of "Ceara" rubber of commerce. The other species have only recently come into prominence, mainly as the result of the work of Dr. Ule in tropical America.

A full description is given in chapter ii. of these species and their natural habitats. The cultivation in different countries, the variability of the plant, its anatomy, morphology, and diseases of various parts are also dealt with. An interesting diagram is shown, giving a good idea of the distribution of the bands of laticiferous tissue. A transverse section through the cortex and bark of *Manihot Glaziovii* shows the connected tangential bands of laticifers near the cambium being broken up as one passes outwards; in fact, from this transverse section one would be inclined to infer that if the tapping instrument was pressed deep enough it would, on every occasion (except where it touched a medullary ray), puncture a laticiferous vessel, and thus give rise to an exudation of latex.

An instructive chapter deals with the various methods of tapping, and a series of diagrams showing the half spiral, half herring-bone, full herring-bone, full spiral, and "V" tapping is given. Some of the tapping implements depicted are somewhat out of date, but will prove of interest to the general reader. Various systems of tapping, including pricking and vertical incisions, are very well illustrated.

The last six chapters of the book (xvi. to xxi.)

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deal with the general research which has been done in connection with rubber, and go somewhat deeply into the problem of tackiness, colour, and preparation of rubber. Even an account is given of the proceeds and revenue from plantations, and of the further uses of rubber trees. The book therefore covers a very wide field, and should prove of great interest to all connected with the rubber industry. Dr. Zimmermann's book will probably stand out for some time as one of the best on species of Manihot.

H. W.

COMPARATIVE ANATOMY.

Vorlesungen über vergleichende Anatomie. By Prof. Otto Bütschli. 2. Lieferung: Allgemeine Körper- und Bewegungsmuskulatur; Elektrische Organe und Nervensystem. Pp. iv+401-644. (Leipzig: W. Engelmann, 1912.) Price 9 marks.

THE first volume of these lectures was reviewed in NATURE in July, 1911, and attention was directed to the comprehensive scope of the work, the lucidity of exposition, and the excellence of the simple semi-diagrammatic illustrations. These qualities are fully maintained in the second volume, which deals with the muscular and nervous systems.

In a work covering such an extensive field of investigation it is quite impossible for one man to acquire a first-hand knowledge of all the material of which he treats, or even to do more than sample the voluminous flood of literature dealing with all the subjects discussed in such lectures as these. In such circumstances it would be easy for the specialist in any one branch of research to criticise the facts and inferences, and in many cases also the choice of interpretations borrowed from other writers. But such defects, which are, of course, inevitable, are more than compensated by the broad, well-balanced, and consistent view the general reader obtains when one competent writer surveys the whole subject.

In recent years intensive specialisation has made most of our text-books a badly-fitted patchwork of the scraps of knowledge which a host of authors has garnered, each in his own patch of cultivation; and most students and teachers have become only too familiar with the ill-jointed and distorted ideas such books convey. In studying such lectures as Bütschli's, even if one admits that the detailed information may not be as accurate as can be obtained in the patchwork type of book by several authors, the reader gets a truer perspective, and sees the facts blended into a picture

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