

resulted from Prof. W. H. Lang's attribution of a Devonian age to the plants assiduously collected by Miss E. M. Lind Hendriks, and from Dr. C. J. Stubblefield's recognition of supposed Ordovician *Orthis* as a Devonian *Chonetes*. The significance of these changes is fully discussed. Regarding the age of the best-known Lizard rocks—the serpentines, gabbros and hornblende schists—Sir John ably presents the evidence; but generally reserves judgment.

The geological description is reduced from 263 pages in the first edition to 178 pages. In the introductory sections, geomorphology and soils receive considerably fuller treatment, and the interrelation of these with the underlying rocks is stressed throughout. These beneficial changes, the incorporation of new material, and the doubling of the number of text figures, especially maps, has, of course, involved the elimination of much detailed descriptive material. Lucid general descriptions and balanced critical discussion are preferred. The result is a combination of simplicity, clarity and scientific accuracy in a high degree. It may be that this work will be considered as representing what the eminent author in the fullness of his administrative and scientific experience regarded as desirable in an official memoir. Nevertheless, because of the elimination of much detailed description of important exposures, it might still be claimed that the old edition remains a valuable work of reference. A reservation should therefore be made that this effective compromise between a rather heavy, fully documented memoir and a much shorter explanatory guide does not necessarily represent a precedent of general applicability.

THE ART OF GRAFTING PLANTS

The Grafter's Handbook
By R. J. Garner. Pp. 231 + 24 plates. (London: Faber and Faber, 1947.) 15s. net.

IN no branch of horticulture has so much ingenuity and manual dexterity been shown as in the art of grafting and budding. Over centuries, gardeners have taken pride in devising new methods by which two or more plants of different origin may be made to combine into a single entity, often for no reason other than to show their skill or originality, though sometimes to improve genuinely upon existing methods. Mr. R. J. Garner has probed deeply into the literature to discover as many of these ingenious devices as seemed to him worthy of preservation, and out of many hundreds he has put on record some eighty-odd methods of grafting, including a dozen or more of budding. All, or nearly all, are accompanied by unusually clear line drawings of the stages in each method, which help greatly to make plain the description in the text. If the book did nothing but bring together these scattered records and preserve them in collected form, it would have achieved something of historical value.

But the author is far more than a seeker into the past; he is a practical propagator of twenty years experience and a scientific man at the same time, and he has used his experience and his critical faculties to bring out the value of particular methods in particular cases and to show how a recondite or unusual means of manipulation may have a scientific justification in special circumstances. More than that, he has brought together the most up-to-date findings of research and the best traditional practices in the field

of propagation as a whole, for he deals not only with the methods of grafting *per se*, but in the earlier chapters he also describes the methods of root-stock propagation and seion-wood preparation, which involves a discussion of many aspects of the problem.

The book is one which must be of the greatest value to the professional horticulturist, the amateur, and the student, all of whom will find in its pages not only guidance in technique but also clear exposition of underlying principles. A word of praise is due to the printers and publishers for the admirable type and format and, above all, for the clarity of reproduction of the author's own exceptional drawings and plates. Only too often photographs in a book of this type serve little useful purpose, other than presumably to increase the sales-value of the book; in this case every plate is a valuable illustration of some special point.

R. H. STOUGHTON

THEORY OF THE STRENGTH OF METALS

Report of a Conference on the Strength of Solids (1947)
Pp. 162. (London: Physical Society, 1948.)

THIS volume is a collection of papers given at a conference in Bristol in 1947 (see *Nature*, 160, 696; 1948) together with a few additional papers. The solids dealt with are almost exclusively metals. The volume is divided into four parts of unequal length under the headings: "Creep and Plastic Flow" (70 pp.), "Grain Boundaries and Recrystallization" (47 pp.), "Precipitation" (20 pp.), and "Fracture" (4 pp.). The papers of the first part are concerned mainly with the deformation of metals associated with movement of dislocations. Dislocation theory has made good progress since the previous Bristol conference in 1939, and in the present volume many of the mechanical properties of metals are plausibly explained in terms of dislocations. The suggestion that solute atoms, such as carbon and nitrogen, may migrate to the neighbourhood of dislocations and hinder their movement gives an interesting interpretation of the yield phenomena in mild steel; and a first treatment of dislocation dynamics gives a plausible explanation of the multiplication of dislocations necessary to explain deformation by gliding. An interesting account is given of an electron microscope and diffraction investigation of slip in aluminium crystals. A notable omission is that a section, containing nine papers on creep and plastic flow and another of six papers on grain boundaries and recrystallization, should contain no papers on grain-boundary creep. The third section contains some good work on hardening of metals by the oxidizing *in situ* of solute atoms having a sufficient affinity for oxygen, and also a paper on the trapping of electrons in silver chloride, which raises the possibility of photographing dislocations.

In a volume entitled "The Strength of Solids", it is surprising that so little attention is given to fracture, and it leaves the impression that even the elements of a theory of the fracture of metals has yet to be given. Nevertheless, in view of recent progress in the study of the plastic properties of metals, we may look forward to a report on a not too distant conference on the strength of metals which does not belie its title.

C. GURNEY