

The Design of Experiments

By Prof. Ronald A. Fisher. Fourth edition. Pp. xi + 240. (Edinburgh and London: Oliver and Boyd, 1947.) 12s. 6d. net.

ONE of the striking characteristics of modern biological statistics is its insistence on experimental design. The most powerful methods of analysis can be used, and the greatest amount of information obtained, only if the experiment is laid out with this end in view. Randomization is necessary for trustworthiness, replication for efficiency and factorial design for comprehensiveness. Without these precautions, the experiment will at best give a poorer return than it need, for the labour and materials expended on it.

The first book devoted to the exposition of these modern principles of experimentation and their translation into design was "The Design of Experiments", the fourth edition of which has just appeared. This now standard work has been changed but little since its first appearance, and the only new addition, a valuable one, is a section on the fiducial limits of a ratio. The reappearance of this book will be welcomed by all who have an interest in biological experimentation.

K. M.

Wonders of Natural History

By E. L. Grant Watson. Pp. 192. (London: Pleiades Books, Ltd., 1947.) 8s. 6d. net.

THIS entertaining and attractively illustrated volume is a reprint of two earlier works, "Enigmas of Natural History" and "More Enigmas of Natural History". To the layman who reads for pleasure, and to the biologist who may read for profit, the author has much to tell that is curious, fascinating, wonderful and puzzling. That is the way of Nature, though we sometimes forget it. But at almost any point, in making casual observations on the life-history or habits of bird or insect, we are brought sharply face to face with the unknown, with phenomena on which the professed biologist so far has little positive to say. A realization of this prevailing state of affairs, an eye for telling examples, and a power of simple, lucid statement, are among the merits of the present work. At the end of almost every paper the author comes to the same point: How was this curious development or relationship brought about in the course of evolution? Is it conceivable that the many complex adaptations, each occupying its proper place and sequence in the individual life-cycle, are merely the result of continuous small variations, or even larger ones? These are still and always will remain topics of major interest in biology. It is good that we should occasionally be reminded of them.

Australia

Its Resources and Development. Edited by Prof. G. L. Wood. Pp. xvii + 334 + 28 plates. (New York: The Macmillan Company; London: Macmillan and Co., Ltd., 1947.) 20s. net.

MORE than a dozen authorities on various aspects of Australia have contributed to this survey of the economic resources and the prospects of the Commonwealth. In a short but sincere discussion on the peopling of Australia, "the general conclusion reached is that the growing period over three-quarters of Australia is not long enough for commercial agriculture". Much of it, however, is suitable for grazing of sheep or beef cattle. Several of the

writers dwell on the problem of water, the risk of drought, the limitations of irrigation and the exploitation of artesian water. Water supply is, of course, linked with hydro-electric resources, which are abundant only in Tasmania and especially in New Guinea. The extent of mineral resources, fuel and possible industrial development are fully considered, and these as well as other problems are approached objectively and fully. Altogether this is one of the most valuable books on Australia that has appeared in recent years. It is illustrated with many photographs and maps.

Current Waterworks Practice

A Practical Treatise on the Provision of Water Supplies for Urban and Rural Communities. By W. H. Maxwell. Pp. viii + 254 + 20 plates. (London: B. T. Batsford, Ltd., 1946.) 21s. net.

THE increasing attention being given to the provision of wholesome water supplies to dwellers in country districts as well as in urban localities has prompted the author to prepare this very useful and practical treatise dealing in a generally comprehensive, and yet succinct, way with the various problems which arise in connexion with projects of water supply. It includes a discussion on a national water policy for rural and other areas, with transcripts of the provisions of the Rural Water Supplies and Sewerage Act, 1944, and the Water Act, 1945. The greater part of the work is of a practical and detailed character, commencing with a description of underground water resources and means for their conservation and protection from pollution, and then proceeding to discuss such matters as the choice of electric motors and other equipment for pumping installations; concrete and cement for constructional work, including the use of reinforced concrete; automatic pump control; methods of water purification and the sinking of wells. The volume is well illustrated by diagrams, and there are particulars and photographs of installations in Great Britain and abroad, showing current practice in reservoir construction. Among the appendixes is a useful statement of water equivalents and other data. There is a serviceable index.

B. C.

The Arboretums and Botanical Gardens of North America

By Dr. Donald Wyman. (Chronica Botanica, Vol. 10, No. 5-6.) Pp. 395-498 + plates 27-43. (Waltham, Mass.: Chronica Botanica Co.; London: H. K. Lewis and Co., Ltd., 1947.) 1.50 dollars.

OWING to the difficulty at the present time in obtaining factual information regarding staffs and equipment of scientific institutions, this account of the botanic gardens and arboretums of North America is welcome. Its survey deals with about ninety gardens of varying importance ranging from the New York Botanical Garden, the Arnold Arboretum, to smaller gardens connected with the botanical departments of universities and also those privately owned but open to the public.

In every case, the function, brief description of special features, ownership, size of collections, herbarium, budget, director, number of employees and list of publications are given.

In addition, a portfolio of prints and photographs of some of the more famous gardens, old and modern, American and foreign are given. There are also plans of some of the larger gardens. A very useful book of reference.