

REVIEWS

The Future of Arid Lands. Papers and Recommendations from the International Arid Lands Meeting. Edited by Gilbert F. White. 453 pp. Publication No. 43 of the American Association for the Advancement of Science, Washington, D.C., 1956. \$6.75 (\$5.75 to A.A.A.S. members prepaid).

The struggle of man toward utilization and productivization of arid areas is as old as agriculture. The fact that the main cradles of human civilization were situated in or near marginal areas forced the early agriculturists to understand the use of natural water resources and to economize them for rational irrigation farming. No wonder that hydrotechnical engineering of the ancient people, East and West, became world-famous for its relatively high level. However, it naturally reached its limits, and despite the ever-increasing world's population threatened by famine, one-third of the globe's surface remained for millenia condemned to sterility and desolation.

It was not until the advent of the present century that governmental and economical bodies began to show great interest in the question of utilization of arid zones for agriculture. Above all, it was the United Nations Educational Scientific and Cultural Organization which only recently internationalized this problem and both sponsored and organized conferences, symposia, and research programs, aiming at the development of arid zones. The organization brought together scientists of various disciplines to discuss problems of arid zone research and development possibilities in Turkey, India, Israel, England and elsewhere.

The book under review is the outcome of one of the recent symposia on arid land problems held in New Mexico between April 26 and May 4, 1955, in Albuquerque and in Socorro. Organized by the A.A.A.S. and supported by U.N.E.S.C.O. and other foundations, it consisted of three-day lectures. The aim of this symposium was to help in solving scientific and developmental problems of arid zones.

The book, edited by G. F. White, of the Department of Geography, University of Chicago, consists of thirty-four papers, most of them presented by United States scientists and a few by scientists from other countries. The book is divided into the following five sections: the first (pp. 3-64) deals with general problems of arid land development and planning of various aspects of future exploration lines. It consists of three articles by Schantz, Kellogg, and Dickson. The second (pp. 67-175) deals mainly with variability, fluctuation and predictability of water supply. Its subjects range from experimental determination of the water turnover to interpretation of climatic records, estimation of water supplies, drought cycles, and predictability of precipitation. The third (pp. 179-254), entitled "Better Use of Present Resources," deals with problems of improvement and restoration of grazing resources, increase of production, economizing water supplies, use of saline water, land erosion and reclamation, and limitation of land use. The fourth part (pp. 255-328), headed "Prospects for Additional Water Sources," deals mainly with the increase of water sources through demineralization of saline water, the induction of artificial precipitation, and the reuse of waste water. The fifth part (pp. 331-435) is concerned with problems of adaptation of plants and animals to arid conditions, selection of more productive plant and animal species, breeding of drought-resistant races, and the danger of locust invasion in desert grazing areas and cultivation patches. Concluding this part is a paper on desert agriculture in Israel, past and present, and research programmes conducted for productivization of the desert.

The concluding section of the book consists of thirty-one paragraphs of recommendations outlining future research on arid lands. They call for interdisciplinary cooperation and organization of research work in basic and applied science concerning arid land development. They include Meteorology and Climatology, Anthropology and Archeological Geography, Geology and Hydrology, Biology, Ecology, and Conservation.

The subject matter in the reviewed book is a very heterogeneous collection of lectures, ranging from archeology to genetics, from geography and geochronology

to plant physiology. The articles differ in length and coverage, some of them being preliminary, others very detailed. They present, however, an example of organizing data, methods, and ideas from very distinct fields of exploration toward the solution of this very complex problem, the future development of arid lands. This is the outstanding feature of this book.—M. ZOHARY, The Hebrew University, Jerusalem, Israel.

Plants of the Pacific Northwest. By LEONID ENARI. 315 pp., 185 figures. 1956. Binfords and Mort, Portland. \$3.00.

According to the author's preface, this book is "intended for the use of college students in elementary courses in botany or biology, high school students, and amateurs out of educational institutions who often find the standard manuals of plant identification too technical." To this end, Dr. Leonid Enari, formerly an associate professor at the University of Portland and now on the staff of the Los Angeles State and County Arboretum, has constructed an easily used key to 663 native or introduced herbs and woody plants of the Pacific Northwest. For the botanically untrained, the technical language of the keys of many contemporary manuals is a formidable barrier to their use. However, Dr. Enari has based his key on floral and vegetative characteristics which can be seen without the aid of a hand-lens, and the use of technical terms is held to a minimum. The artificial key leads the user directly to species determinations, although in the text the genera are grouped under family headings.

Another convenient feature of the book is that the glossary of terms and the illustrations of plant parts are inserted next to the key. The illustrations are simple line drawings by the author; those accompanying the text are primarily outlines of single leaves of several of the species. Some of the few habit sketches included have apparently suffered from reduction in printing, and some of the lines are obscured by running of the ink.

The species are numbered in the key, and are listed in the same numerical sequence in the text. Each species is listed by both its Latin binomial and one or several common names. Following the names is a short, synoptic description of the plant and its habitat, although geographical range is not given. Appended to the text are separate indices to the Latin and English names of the plants. Typographical errors are few, and none is very serious. The book is attractively bound in green cloth, popularly priced, and small enough to be carried conveniently in the field.

This book will appeal to the amateur interested in identifying the conspicuous plants of the Pacific Northwest; its greatest recommendation is its simple and easily used key. Once the fundamentals of using this key are in hand, it will be a relatively painless transition to the more technical floras and manuals of the region covered.—ROBERT ORNDUFF, Department of Botany, University of California, Berkeley.

Portraits from Memory. Recollections of a Zoologist. By RICHARD B. GOLDSCHMIDT. 181 pp., 13 figs., 1956. University of Washington Press. \$3.50.

These "recollections of a zoologist" should be greeted with enthusiastic appreciation by all biologists. All of us are concerned with the history of that body of facts and principles whose formulation or discovery began with Strasburger's description of mitosis, 1875, and was completed (in the sense that the enormous mass of subsequent discovery had added more to detail than to principle) by the adequate inductive establishment of the chromosome theory of heredity by Morgan and his associates, 1915. The facts are drawn indifferently from flies, maize, or molds; the principles apply alike to all nucleate organisms; the personalities of the scientists who established them should be interesting to all of their successors.

Goldschmidt was the pupil of several of the first founders of this body of science, and is himself noted, among other things, for studies of sex intergrades in moths and for the opinion that genes (in the usual sense of the word, designating some sort of discrete bodies) do not exist. Exiled by a tyrant on grounds of "race," he was made



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