BOOK REVIEWS, continued

The second volume considers the effect of a charged phase boundary on the ions and solvent. The Guoy-Chapman-Stern ion distribution is explained in a way that would enlighten all soil and biological scientists. Most of this volume is devoted to the effect of imposed current on the transfer of electrons. The authors believe that overemphasis of equilibrium, Nernstian conditions stifled electrochemistry. The major emphasis therefore is on current-potential relations such as over potentials, electron kinetics, and non movement in potential gradients. The last chapter discusses the possible future role of electrochemistry in corrosion control and in energy conversion and storage. Electrochemical cells are far more efficient than combustion processes but these fuel cells will not solve the more difficult problems of the ultimate energy source and better energy utilization.

Corrosion and energy are clearly tremendously important, but I wish the authors had spent a page or two speculating on future potentiometric and other electroanalytical methods of chemical analysis. Specific ion electrodes, for example, seem to hold great promise. These electrodes are discussed in another book but not as critically as Bockris and Reddy are inclined to do.

Most of the first volume and some of the second have a great deal to offer directly to electrochemists. Fundamentals of electrochemical principles are treated in a very accessible manner. The fundamentals of water and ions. The frankness in mentioning past errors of direction and emphasis taken by electrochemists is refreshing. Other disciplines would profit from a bit of similar soul-searching. The index is extensive, the paperback volumes are sturdily bound, and the price is reasonable.

—H. L. BOHN, PROFESSOR, THE UNIVERSITY OF ARIZONA, TUCSON.

Coastal Deserts: Their Natural and Human Environments


The book is 9 by 12 inches in size, well bound and attractive. It is divided into four parts: General Considerations, Latin American Deserts, The Old World Deserts, and Australian Deserts. The four parts contain a total of 24 chapters written by various authors. The book is largely the result of a symposium on coastal deserts, held in Peru in March and April, 1967. Some of the chapters evolved from the symposium and others were prepared especially for this book. Size of the chapters varies considerably since some are only two pages long. Most chapters have a useful reference section at the end.

In chapter 1, World Distribution of Coastal Deserts, climatic differences are used to subdivide these deserts into four principal types—hot, warm, cool, and cold. The hot coastal deserts are the most extensive. The climates of various coastal deserts are also major subjects of chapters 9, 10, 11, 14, 17, and 20. -

Chapter 2, Remote Sensing of the World’s Arid Lands, summarizes the character and usefulness of remote sensing. The author notes past results for the usage of space photography to arid lands. Most of the unclassified data released for general use have been from equatorial orbits (roughly 30° north and south latitude) which cover three-fourths of the world’s arid lands. Also, the scant cloud cover and water vapor have made arid lands difficult to photograph during both planned and random times. Excellent illustrations of different kinds of photography from various spacecraft are given. The author suggests that combining space-acquired information with digital telemetry (available from weather and communications satellites) would provide a great quantity of sophisticated data about the world’s arid lands and their occupants over the next few years. He specifies a problem in analyzing the information. “We are in the position of being overwhelmed by data we have desired for years because we were unprepared to handle the tremendous volume available. It would be tragic, however, to let the opportunity pass and the data go undeveloped and unused.”

Chapter 6, Desalted Seawater for Agriculture: Is It Economical?, concerns the present status of agricultural use of seawater. After comparing the cost of desalting seawater and the value of the water for irrigation, the authors conclude that the costs of proposed desalting projects (now and for the next 20 years) are at least one whole order of magnitude greater than the value of the water to agriculture. The authors do not argue against continued research, but close with a warning that “. . . let us not delude ourselves or the rest of the world that an early and practical solution is at hand.”

Chapter 7, Plastic Oases for Arid Seashores, considers the next step for desert lands by the expanding population, and the associated problems of food. The authors indicate that desalted water will be too costly for conventional agriculture in the foreseeable future; a major obstacle is that a crop in the desert normally requires many times its own weight in water for growth. If a plant could be encapsulated within an environment having high relative humidity, the vapor gradient may be reduced, thereby reducing evaporation and the amount of water required for plant growth. Experimental work was undertaken to study the problem. Air-inflated greenhouses with controlled environments were used to grow vegetables in Mexico. The vegetables were grown directly in beach sand and fertilized through the irrigation system. Yields were far greater than in open fields.

Other chapters provide excellent discussions of climate, economic, development, and the general character of the various coastal deserts—mainly in Chile, Peru, North Africa, Southwest Africa, Israel, and Australia. Case histories of specific areas show the great extent of research and planning undertaken in coastal deserts. Chapter 22, Eilat: Seaside Town in the Desert of Israel, was found to be of particular interest in this respect.

It is unfortunate that more information could not be given concerning the soils of coastal deserts. However, the same comment applies to most books about deserts.

This book contains useful information (both general and specific) about many of the coastal deserts of the world. It is recommended to all who are working in or are interested in deserts. Part One, alone, is worth the price of the book.—LELAND H. GILE, SOIL SCIENTIST, SOIL CONSERVATION SERVICE, USDA, AND ADJUNCT PROFESSOR OF AGRONOMY, TEXAS TECH UNIVERSITY, LUBBOCK.

Soil Organic Matter and its Role in Crop Production


This book represents the culmination of Dr. Allison’s life work, having been published after his death.

Dr. Allison has made the broadest possible interpretation of the role of organic matter in crop production; in many respects this book is as comprehensive as a general treatise on soil science. The book utilizes 638 pages of fairly small print. It starts with a historical introduction dealing with some agricultural practices over the centuries, going back to ancient civilizations. There is a chapter on “Formation and characteristics of mineral soils,” similar to those found in several introductory texts in soil science. The chapters on “Microflora of soils,” and “Animal life of soils,” suffer somewhat from the lack of illustrations, which would greatly enhance their value. More space is devoted to micro- and macrofauna than to microflora, possibly to stress the importance of soil animals which are often given only passing mention.

The section on “Formation and nature of organic matter in mineral soils,” comprising four chapters, is presented in easily understandable fashion, although the organic matter chemist might wish for a little more depth in the chapter on “Nature and composition of soil organic matter. The inclusion of a chapter on “Interaction of organic matter with clays” is commendable. The section on “Sources and possible fate of nitrogen in mineral soils” deals with biological fixation of nitrogen in conventional fashion, but includes also a chapter on “Non-biological immobilization of nitrogen” which treats this subject much more extensively than is usually done in a book of this kind. The well