The drawers of water have quite definite opinions on the indicators that reflect good and bad water quality. Their opinions may not reflect the quality indices which most specialists would find of concern but they are firm in their opinion as to which sources are of poor quality. The cost of the water is another factor in the perceived quality in terms of number of responses indicating that a second-best quality may be selected if the effort to obtain the best seems too much.

In the face of the difficult decision of how to expend the limited resources of the developing country, what, then, is the best strategy in water development? The authors suggest that in urban areas systems should be brought up to a minimal standard of one tap per house, while in the rural areas where the dispersion of the homes makes a piped supply too costly, efforts should be made to provide all inhabitants with a minimum of 20 liters per day from sources with at least rudimentary sanitary improvements. In addition, individual homeowners should be encouraged to make independent improvements such as gutter and tank to store roof runoff, cisterns, etc. These recommendations, as minimal as they may seem, offer the chance of bringing some improvement to most of the people of East Africa.

With more elaborate plans, increasing fractions of the people would get nothing.

The book should prove interesting reading to persons concerned with water supply, public health, or policy planning. A wealth of references and the case studies made for this book provide much food for thought. Every indication is that the problem of water supply in the developing countries is one which requires some very serious thought.--RAY K. LINSLEY, Hydrocomp, Inc., Palo Alto, Calif.

Physical Edaphology: The Physics of Irrigated and Non-irrigated Soils

Physical Edaphology is the collection of Dr. Sterling A. Taylor's lecture material into a text for a course of the same name taught at Utah State University. The book reflects his ecological approach to teaching beginning soil physics. He completed the manuscript except for revisions before his untimely death in 1967. In 1969, Galen L. Ashcroft took over this task and revised and updated parts of the book. A completely new chapter, written by J. W. Biggar and D. R. Nielsen, was added to the manuscript prior to publication in 1972.

This text is oriented toward the study of soil-plant-water relationships and the authors begin in chapter 1 by showing the reader the need in irrigation science for a good basic foundation in physical edaphology. In chapters 2, 3, 4, 5, and 6 the reader is introduced to the principles, examples of endpoints and indicators used in bioassays, and retention. Soil structure, aeration, and temperature are discussed in chapters 11, 12, and 13. The remaining chapters (14, 15, and 16) are devoted to the application of the knowledge just gained to irrigation practices. For further information on a given topic, the reader is often referred to up-to-date literature. The authors use many excellent tables and schematic diagrams, some of which suggest good laboratory exercises for the student. An outstanding feature of the book is the appendices which contain summaries of basic concepts, dimensions and units for physical quantities, conversion factors, values for physical constants, and a list of symbols used throughout the book.

Physical Edaphology is a well-written, easily-read book. One is hard pressed to find areas of the book that could be criticized. One such area might be a short section at the beginning of chapter 3 which presents theoretical methods of estimating evapotranspiration. This section contains several rather complex formulas which could be difficult for most beginning students to fully understand. However, this is but a small part of the chapter and is necessary for a complete picture of the theory and application of present knowledge of evapotranspiration.

The authors carefully define and then use up-to-date terminology. The book makes sometimes confusing concepts look simple and quite logical. One such analogy is the comparison of the temperature in a house and the heating capacity of its furnace to the soil water potential and the soil moisture content. The analogy being that a person in a house is more concerned with a comfortable temperature than the heating capacity of the furnace as is the case for a plant which is more concerned with a comfortable soil water potential than the total moisture content of the soil.

In summary, this reviewer feels that this book is an excellent contribution to the growing list of text books in the field of agri-cultural science. It is suitable for authors give such a good survey of present day theories and concepts along with logical explanations and examples which bridge the gap between theory and practical application. I recommend this book both as a text for class work and as a reference.--WILLIAM L. POWERS, Kansas State University.

Bioassay Techniques and Environmental Chemistry

At a time when the analytical chemist is grappling with the detection of minute amounts of the highly teratogenic impurity tetrachlorodibenzo-p-dioxin in the ppt range by the use of a double focusing mass spectrometer equipped with a time average computer, this is refreshing to see another approach to environmental chemistry. Bioassay Techniques and Environmental Chemistry is a compilation of 27 chapters, authored by experts in the fields, dealing with the use of living organisms as biological and chemical indicators of environmental problems. It is a timely summation of the current "state of the art" in bioassay technology.

The book is divided into five major sections dealing with environmental complexities, use of bioassays to illustrate general principles, examples of endpoints and indicators used in bioassays, conditions and supporting techniques for bioassays, and applications. The book is almost entirely devoted to bioassay techniques associated with water pollution. It does not deal with plant bioassays, insect bioassays, etc.

The major weakness of the book is its lack of coherency that is inherent in any volume comprised of contributed chapters by authors from a multidisciplined background. Glass has largely been able to overcome this difficulty by grouping the chapters under five major headings.

Its major strength is the methods approach used throughout the book to illustrate how bioassay techniques can be used to assess environmental problems. Noteworthy in this regard are several sections devoted to current ecosystem design and modeling. Anyone contemplating the use of static microecosystems may want to refer to those chapters dealing with the advantages and utility of flow-through techniques.

The first chapter deals with mercury in the aquatic ecosystem and is a comprehensive coverage of the environmental complexities encountered with this compound. It is an approach taken by the author, Frank M. D'Tiirri, that has considerable experience with the mercury problem as it relates to the Great Lakes.

The second section of the book includes three chapters and deals largely with fish toxicity. The third section consisting of eight chapters is devoted almost exclusively to various organisms used in bioassay techniques and covers planktons, diatoms, algae, aquatic plants, poikilotherms, and mammalian cells as bioassay indicators. The fourth section considers in some detail the techniques and methods used in conjunction with bioassay techniques.

The last section is comprised of nine chapters on the application of these techniques to various pollutants. Somewhat disappointing in this section is a rather brief discussion of pesticides. The current controversy surrounding the continued use of organic pesticides in crop protection programs largely centers around the ability of these molecules to move from their site of application and to biomagnify in the food chains of aquatic organisms. Although there is now a wealth of literature on the environmental conditions which are responsible for the partition of these highly lipophilic molecules into the fatty tissue of aquatic organisms, the book devotes essentially no space to this most important environmental problem.

Bioassay Techniques and Environmental Chemistry does offer a valuable contribution, particularly to the aquatic biologist, toxicologist, environmental chemist, and physiologist venturing into the field of environmental chemistry for the first time. The book is an excellent starting point for those not familiar with the field and contains many valuable illustrations and references.--P. C. KEARNEY, Agricultural Environmental Quality Inst., USDA-ARS, Beltsville, Md.