BOOK REVIEWS

The Chemistry of Clay Minerals

This book is number 15 in a series of books titled "Developments in Sedimentology." The book is devoted largely to the layer silicates of clay size, although macroscopic chlorites, vermiculite, and sericite are discussed. Other minerals of clay size are mentioned briefly. One outstanding feature is the extensive compilation of chemical analyses and formulae of these minerals based on their chemical analysis. There are excellent discussions on the origin of these minerals and the morphology and internal variations in size of the octahedral and tetrahedral sheets and rotation and tilting of tetrahedra to accommodate the chemical content of the minerals. The chapter of most interest to the reviewer is entitled "Relations of Composition to Structure."

The chemistry of weathering and electrochemical reactions are treated only to a small degree. The literature through 1969, for the fields reviewed, is covered extensively, although there are some important omissions. For example, the 2-layer structure of nacrite proposed by Bailey (1963) is not mentioned.

This book has considerable value in supplementing other texts on clay mineralogy. Thus, it would be of value to the student in the general area of clay mineralogy as well as being an excellent source of information and references for the research worker and teacher.—C. I. Rich, Professor of Agronomy, Dep. of Agronomy, Virginia Polytechnic Institute, Blacksburg.

Microbial Life in the Soil, an Introduction

This book presents the subject of soil microbiology in a unique way that involves the interweaving of relevant subject matter from other disciplines and that includes mathematical formulations to a considerable extent. The author employs a style combining topic outline with exposition that is easy to read and that facilitates rapid skimming of information dealing with a specific subject or organism. The book is well supported throughout with good charts, diagrams, and tables. In spite of good organization and relatively complete coverage, some important subtopics of soil microbiology are not dealt with in very great detail.

The book begins by developing a reasonable, theoretical approach to the origin and evolution of microbial life in relation to the history of the earth. A somewhat sketchy but up-to-date presentation of the kinds of soil microorganisms is given along with a more adequate coverage of the topic of distribution of microbes in soil. There is a good discussion of microbial physiology including limited biochemical explanation, but adequate coverage of energy availability, aeration, and microbial growth with supporting mathematical formulations. The subject of interactions between microbes is dealt with in some detail using appropriate mathematics and including a discussion of correlation techniques for evaluating the kinetics of microbial reactions. Interrelationships between colloidal systems of the soil and the microbes are examined in depth by considering surface charges and their effects on enzymes, and on other aspects of microbial activities. Soil aggregates and associated physical properties are explored in relation to microbial environments with major attention given to effects of water and aeration. A discussion of the relationships between microbial activity and plant growth is not very detailed, but appropriately given primary attention to the nitrogen cycle, some emphasis to the rhizosphere, while a minimum coverage is given to decomposition of residues and humus formation. The concluding section deals with energetic aspects of microbial growth, energy flow in soil, the mathematics of microbial activity, and a brief outline of the role of microbes in geochemical changes.

The author, Hatotri, is associated with the Institute for Agricultural Research at Tohoku University, Sendai, Japan. He presents an approach to soil microbiology quite different from other available texts. The book certainly will be of interest to advanced students and professionals in the field of soil microbiology.—George H. Wagen, Professor of Agronomy, Dep. of Agronomy, University of Missouri, Columbia.

IV. Colloquium Pedobiologie

The proceedings of the IVth International Colloquium for Soil Zoology are presented in this volume in 54 papers. Thirty-five research articles are in English, 11 in German, and 8 in French. French and German articles have abstracts in English (with one exception), and English papers are mostly summarized in French. Standard literature citations are given with each article. Also, discussion between participants at the meeting follows each article. Finally, the volume includes the list of participants plus their addresses, an author index, and a valuable systematic index.

Even though "Soil Organisms and Primary Production" was the conference theme, only six of the articles deal directly with organism interactions and primary productivity. However, d'Aguilar in his introduction recognizes that some of the reports hardly seem to fall within the limits of the theme; he justifies this by using the important indirect relationships of productivity and regeneration through decomposer organisms. Unfortunately, too few of the authors made any attempt to show or hypothesize on how their research results with soil organisms affect primary production indirectly. If a theme is to be used, each researcher should make an effort to reflect it, at least in some small way, during his communication. Otherwise the colloquium committee should dispense with selection of themes.

Aside from this minor shortcoming, the text is an excellent compilation of research results, and emphasis of thought by prominent soil biologists. Worldwide representation and numbers of papers presented were: USSR 12; England 7; France 6; Netherlands and Germany, 5 each; Hungary and US, 3 each; 2 from both Canada and Australia, and 1 each from Belgium, Czechoslovakia, Denmark, Egypt, India, Japan, Nigeria, Poland, and Yugoslavia.

Articles are logically presented under the following headings: primary production from microorganisms, biological interactions, food chains and ecosystem analysis, organic matter degradation and liberation of biogenic elements, and action of human factors. Many soil scientists should find information of value in one or more of these categories. For the microbiologist, 17 articles emphasize data about fungi, algae, and protozoa. Nineteen reports deal with litter decomposition while nutrient cycling and elemental interactions (N, K, P, C), are discussed in 13 papers. Most of the communications (40) stress interactions of soil invertebrates with more than a third of these articles providing valuable data on earthworm ecology. Lastly, nitrogen flow and the impact of organic matter retention and soil organisms as regulators of terrestrial production are two topics presented from an ecosystem modeling approach. Such diversity of content provides the reader with a fine overview of physiological, population, and community ecology of the soil biota. Therefore, all who are interested in soils, be they specialists in physical, chemical, or biological areas, should find this book informative and stimulating. Also, it would be a good text for courses in soil ecology or for the topic of seminar discussion if the cost is not too prohibitive.

Few negative aspects were found. It appears to have been well edited. There are a few typographical errors within the body of the text. Also, in the original printing all of the page numbers were omitted from the systematic index, however, the publisher has provided a replacement erratum for that index so all copies should include one of these inserts. Some individual articles have weaknesses, but these are relatively minor. Each paper could be reviewed with greater scrutiny, but that is impractical here.