BOOK REVIEWS, continued

In Chapter 1, Baker intrepidly relates behavior of Mg in soils to that of other major cations as he presents a broad review of colloidal chemistry, cation exchange, and cation availability. He also gets in some plugs for his equilibration method of soil testing.

The current state of knowledge in the Mg-related grass tetany problem is dealt with comprehensively in three chapters. The problem, which appears to be increasing as production and quality of forage crops are improved, is alluded to in several other chapters. It becomes clear that tetany is a metabolic deficiency of Mg in the animal, but the contributions of the soil and of the plants eaten by the animal seem to be among the riddles. Obviously, more research is needed, and it is apparent that isolated study of soils, plants, and animals will not provide the answers. However, there are several good examples of research relating management of Mg in soils and crops to quality of feed for livestock.

In contrast to animal health, the immensely important interactions between soil, food, and human health have received only scattered research efforts. The potential momentousness of these interactions is illustrated by the last two sentences of the fascinating and well documented chapter by Seelig and Bunce on the contributions of Mg to human disease.

"...the major cause of death in the Western world, that associated with cardiovascular disease, may also be contributed to by sub-optimal Mg intakes. People living in geographic areas characterized by Mg-deficient soil and water, like the southeastern portion of the United States, may be particularly prone to diseases to which Mg deficiency contributes."

Probably the most directly useful information in this collection of reviews could be gleaned from the section devoted to southeastern United States. Care must be exercised, however, in broadly applying this information to areas of the world where soils, climate, and crops differ markedly from those in the Southeast. The earlier chapters are helpful to the crop manager only to the degree that they contribute to a general understanding of Mg behavior. The chapter dealing with tissue testing neatly points out the mind-boggling hurdles faced by those who would make Mg recommendations based on plant analysis. Research needs in the soil testing area certainly become obvious when we see soil levels of Mg considered adequate in the Southeast ranging from 40 to 300 pounds per acre.

This book lives up to its promise, stated in the preface, of discussing Mg in the environment from the viewpoints of many scientific disciplines. It suffers the problem of all symposia — the lack of synthesis across disciplines. But it serves us well in pointing to the necessity of such a synthesis. It is a most worthwhile book.—R. J. Bartlett, Plant and Soil Science Department, University of Vermont, Burlington, Vermont.

Tropical Geomorphology

The subtitle of this book is A Study of Weathering and Landform Development in Warm Climates. The author states that his aim is to establish a basis for the study of landscapes that have evolved without the influence of frost, snow, ice, wind, or coastal processes. The emphasis is on chemical weathering, mass movement and surface water flow. If there is a central theme, it is that landscape development in the tropics (and perhaps elsewhere) can best be considered within the framework of Budel's concept of double surfaces of weathering. Briefly, the concept is that in the relatively stable areas characteristic of much of the tropics, weathering leads to the formation of a deep regolith, often including laterite, over an irregularly "etched" subsurface. This regolith, as well as the underlying weathering front, should be recognized as parent material for subsequent landform and soil development. Erosion can proceed in many ways, ranging from complete stripping of the regolith to reveal underlying rock profiles to relatively superficial redistribution of upper layers. Hence, soils and rocks may form on various portions of the weathering profile, whether in situ or transported.

While most of the observations discussed are located in the eastern hemisphere, especially Africa, this reviewer feels that they are equally valid for much of tropical America, particularly South America east of the Andes. For example, classic weathering profiles (often including laterite), transported pediments, saprolite lithosols, and borrhards (granitic domes) are found in varying quantities through much of Brazil, the Guyanas, and Colombia, at least. The distribution of these phenomena often appears haphazard, but the concepts presented in this book seem well suited to providing the complex interrelationships. The book's author stresses, however, that only detailed studies can substantiate the hypotheses. Sweeping, single-process explanations are no longer fashionable or acceptable.

Soil scientists will be pleased to note that about 20 of their colleagues are represented in the extensive bibliography, ranging from L. T. Alexander to A. R. van Wambke. However, most of the citations are from the British and European geological literature and thus will be new to the majority of U.S. readers. Also, a high percentage of the references are post-1960. The result is something of an adventure for Americans whose knowledge of the geomorphological literature ends with W. M. Davis, L. C. King, and R. V. Ruhe. (It is a pity that the SCS group favored by Ruhe has been unable to work in the tropics.)

This is a valuable but difficult book. The value lies in the new insights it provides into landscape and soil development. The difficulty is due to unfamiliar concepts, the technical vocabulary, and the tendency to discuss each topic in several different chapters. While it is not designed for use as a text, this book provides valuable supplementary reading for intermediate and advanced courses in soil genesis and classification. It should be most useful for soil scientists assigned to tropical countries. However, all agronomists interested in landscapes should find it stimulating and possibly applicable to their own environments.

The photographs and figures are well reproduced and often greatly facilitate comprehension of the ideas presented.—Robert B. Carter, North Carolina State University/USAID, Bogota, Colombia.

Soil Organisms and Decomposition in Tundra

The Proceedings of the Microbiology, Decomposition and Invertebrate Tundra Working Groups, which met at the University of Alaska in August 1973, have been published in a soft cover volume. The 18 tundra sites discussed range from warm oceanic to cold continental with the majority of the sites occurring in the Northern Arctic.

The volume provides the data base for papers on soil organisms and decomposition processes which will appear in the tundra biome synthesis volume in the IBP series to be published by the Cambridge University Press. Although a more condensed, integrated volume will appear at a later date, the detailed information given in the above volume should prove most useful to soil microbiologists, ecologists and geochemists.

The subject matter covered includes measurements of bacterial and fungal counts and estimates of bacterial production. Two chapters cover the interactions between fauna and microflora and the activities of soil invertebrates in tundra ecosystems. The section on decomposition includes mathematical simulation models of decomposition processes, relationships between respiration, decomposition of organic matter, and cellulose decomposition, as well as measurements of nutrient turnover.

The book is very well edited, if any, data have been available on the occurrence and activity of microorganisms in tundra sites. This well referenced, detailed volume has gone a long way to correcting that deficiency. There is more detail than required by many readers and some of the data requires further synthesis and interpretation. However, the volume should be a valuable addition to the libraries of many departments. At the very reasonable price of $5.00, it will make a useful personal copy for the desks of soil microbiologists, microbial ecologists, and geochronologists interested in ecosystem studies.—A. Paul, Department of Soil Science, University of Saskatchewan, Saskatoon, Canada.