BOOK REVIEWS, continued

...larieties are drawn between these two erosive forces, wind and water, on soil erosion. Although the wind erosion equation is discussed briefly, it would have been helpful if it had also been presented in as much detail as the soil erosion equation with similar examples on its use by the reader and student. Chapter 4, "Soil-Loss Prediction Equation," discusses in some detail the factors in the soil-loss prediction equation. The author includes several tables and examples for the use and application of the soil-loss prediction equation by the reader and student for practical use in soil and water conservation planning. Chapter 5, entitled "Rainfall and Runoff," discusses the hydrologic cycle and the effects of watershed characteristics on the hydrographs of runoff.

Chapters 6 through 10 emphasize the basic design and construction of soil and water conservation practices, and include tables, charts, equations, and diagrams to acquaint the reader and student with the basic engineering aspects of the construction and design of such practices on the land. These practices include: grassed waterways and underground outlets; terraces; cross-slope channels, diversions, and basins; spillways and earth embankments; and farm ponds. In each chapter, examples and sample problems are included to help the reader become familiar with the design characteristics and calculations for these practices. Reproductions of tables, graphs, and diagrams from USDA and SCS engineering handbooks and publications are included in each chapter to assist the student in solving sample design problems or field exercises.

Chapter 11, "Planning Agricultural Systems," discusses the combining of various agronomic and soil and crop management practices with the conservation engineering practices into an overall conservation system for agricultural land. This includes a brief discussion on crop cover, tillage, and the design of contouring and strip cropping systems. Chapter 12, "Planning for Urban Development," similarly discusses the combination of conservation practices and systems for erosion and sediment control in urban areas, including construction and development sites.

The final three chapters, Chapters 13 to 15, cover data necessary for a student to conduct the basic engineering procedures discussed throughout the book for the design and layout of conservation practices. These chapters include discussion of: measuring distances, areas, and volumes; basic surveying principles and the uses of levels and leveling; and the principles and uses of land surveys, topographic maps, and aerial photographs.

This book, because of the author's background, emphasizes the engineering aspects of soil and water conservation and erosion control. It provides a good handbook on basic engineering principles for the student in soil and water conservation. Numerous example problems are given throughout the chapters on the basic design of conservation practices to acquaint the student with these engineering principles. Sample problems and questions are given at the end of several of the chapters for the use of both the student and instructor, to review and better acquaint the reader with the information covered in that chapter. The book could have been made more helpful to the student in soil science and agronomy if more detail and discussion of the theory of the causes and effects of soil erosion were covered in the first five chapters.

The chapters on planning agricultural and urban systems, in which all of the principles are pulled together for overall erosion control plans, are of such great importance that they should have included more detail and discussion of the interactions of the various practices in such plans. Also, more discussion of the pollution and environmental quality aspects of erosion and sedimentation would have enhanced the use of the book by the modern soil and water conservation student. This is particularly true because of the part that sediment plays in pollution from both agricultural and urban land, and its close relationship with potential pollution problems from agricultural chemicals. In these same chapters, more recent references from research and publications in the last few years would have enhanced the discussion of the principles of soil erosion and sediment pollution.

This book, however, does provide a broad view of the subject of soil and water management and erosion control and the basic engineering principles involved for a practical course in soil and water conservation and erosion control engineering.—B. L. SCHMIDT, Professor and Associate Chairman, Department of Agronomy, Ohio Agricultural Research & Development Center, Wooster, Ohio.

Geology of Clays: Weathering, Sedimentology and Geochemistry


The author notes in his preface that geology, like other fundamental scientific disciplines, is diversifying; hence, students must be trained basically. Later the bright students must be given specialty tools, one of which is books, of which Dr. Millo has written an excellent example. The author is professor of geology and dean of the faculty of sciences, University of Strasbourg, France.

The chapters proceed: (1) The clay minerals; (2) Argillaceous rocks; (3) Geochemistry of ions in the hydrosphere; (4) The place of clays in the geochemical cycle; (5) Weathering and soil clays; (6) Clays of the continental sediments; (7) Clays of the marine sediments; (8) Evolution of the clay fraction in some great sedimentary series; (9) Silicifications, flint, and growth of crystals; (10) Genesis of clay minerals: Inheritance and transformation; (11) Genesis of clays: Neof ormation and synthesis; (12) Superficial geochemistry and the silicate cycle; and bibliography.

Throughout, the dynamics of clays is emphasized—crystal degradation and aggradation as environments involve leaching (as in soils) and hypersaline waters (as in sediments). Mobility of Si, Al, Fe, Mg, Ca, K, and Na is considered in detail. The true solution of Si(OH)₄ is emphasized; the obsolete notions of earlier times about colloidal silica and its flocculation are shown to be of limited applicability. Growth of iron oxide coatings (rubification) and crusts (laterization) is documented for numerous landscapes.

Faithful detailing of the results of individual investigations is given with documentation of the references. Liberal use of original diagrams provide a crucial value, particularly since much research originally published in French, German, and other languages is made available and synthesized into this monumental treatise and interpretation. Much groundwork is laid for thermodynamic treatment of clay formation, a field which has largely been developed since this book was written (about 10 years ago).

Errors are few, e.g., hypogene for hypogene on page 41, and are easily recognized without distraction from the theme. Many detailed locality discussions could have benefited from locality index map inserts. Some will find the book biased to the French literature, readily at hand to the author, but this natural consequence has the virtue of making this treatise available to the many who do not readily read the French language. Some will find a certain element of repetition, e.g., the inheritance-transformation-neof ormation-yet this is inherent in the outline which "cuts across the grain" of situations (soil, basins, oceans) when the processes repeat. Above all the author presents the facts and expresses his meticulous care in evaluating them to reach conclusions in marvelous prose that has survived the translation in all its beauty.—M. L. JACKSON, Professor of Soil Science, Department of Soil Science, University of Wisconsin, Madison, Wis.