BOOK REVIEWS

Geology of Soils: Their Evolution, Classification, and Uses

The book has chapters on Geologic Time, Weathering and Erosion, Landforms, Climate, Flora and Fauna, Surface Deposits, Modern Soils, Ancient Soils, Physical Properties, Mineralogy and Geochemistry, Ground Fertility and Erosion, Some Engineering Aspects, and a final chapter called Checklist that summarizes parts of soils and surface deposits. The author has included an extensive annotated index and glossary.

The purpose of the book is to stimulate greater interdisciplinary study of the ground around us, although it is presented with a very definite geologic bias as one would expect since Dr. Hunt is a geologist. The writing is very light and readable. A moderately competent reader does not become lost or confused. One outstanding feature is the illustrations which are abundant and superior and add greatly to the clarity of the presentation. Soil scientists should note this feature.

The first seven chapters of the book could be useful for supplementary reading in an introductory soils course because they deal largely with geologic features or have a definite geologic bias that would be difficult to obtain elsewhere under one cover. However, in attempting to cover a large part of a complicated subject in a few chapters, the author has had to give a very brief, almost superficial, treatment to many topics. But the best object of the book is that many concepts (i.e., their classification, use, mineralogy, fertility) reflect the thinking of 20 to 30 years ago. It is a lot like reading a textbook published about 1945 to 1955.

Many classic references are given, but there are very few references later than 1966 and many of these are textbooks. Geologic references are used much more than those from soils literature. This is not a fault in itself, but it does limit the beginner in his search for late ideas and facts. Moreover, many of the citations given in the figures are not given in the bibliography at the end of the chapter. In chapter 7, three of the citations out of a total of seven could not be found.

The rather scanty, and in many places almost archaic, treatment given soils in the last half of the book make it of little value to soil majors. This reduces its value greatly as a soils textbook for geology, engineering, or biology majors at the college level. There are many more up-to-date sources of information available.—R. B. Daniels, Research Soil Scientist, Soil Conservation Service, USDA, and Soils Department, NCSU, Raleigh, North Carolina.

Fundamental of Soil Science—Fifth Edition

This outstanding book continues to rank high as a text for introductory soil science courses. It was designed probably for a one semester college level course in soil science; although by selecting the desired chapters, it could be used for a one quarter course very adequately.

The authors have improved this edition in several ways. The scope has been broadened to include an introduction to the soils of the world. Chapter 10, “Classification and Geography of the World’s Soils,” does an excellent job of outlining for the student the most recent widely accepted soil classification system. Sufficient detail is given to be meaningful in grasping the important concepts of world soil classification and geography that is so greatly needed by students of this ever shrinking world of ours.

In an attempt to add a dimension of relevance to the subject of soil science beyond that of the 4th edition, the authors have briefly related soils to such current interest topics as ecology, pollution, waste disposal, and land use technology, world population, and hunger. To suit the needs of many nonagriculture students, many of whom are interested in soil as a natural resource, outlining more extensive interrelationships may have been warranted.

The sequence of chapters presented in this edition is the same as the previous edition except that the Soil Organisms and Soil Organic Matter chapters precede the Soil Chemistry chapters. After the first two introductory chapters, the fundamentals of soil physics, soil biology and soil chemistry are presented, followed by soil genesis, survey, and classification. The applied aspects of soil science complete this orderly unfolding of this growing field of knowledge.

Unfortunately, there are some drawbacks to this edition. The picture reproductions are generally of poorer quality than the previous edition. The newly added photographs are of excellent quality, whereas those reproduced from the 4th edition tend to be fuzzy.

The study questions that were at the end of each chapter in the previous edition have been deleted in this edition. It is not certain that this change is desirable since questions can help to guide a student’s reading of the chapter. This change may have been dictated by the economics of higher publishing costs.

Although some clearly needed revisions and additions were made in this edition, they were not as extensive as in the 4th edition except for the chapter on soil classification and geography.

Dr. Foth continues to keep this text on the competitive market by his periodic updating and revising of the material, to keep it interesting and relevant to the needs of students and instructors alike.—B. R. Sacey, Professor of Agronomy, Agronomy Department, Colorado State University, Ft. Collins, Colo.

Stress Strain Behavior of Soils

This book is the proceedings of a symposium held March 29–31, 1971, in Cambridge to honor the memory of Professor Kenneth Roscoe who, until his untimely death, headed a distinguished soil mechanics group in the Engineering Department of Cambridge University.

The symposium include six sessions, each opened with a very substantial paper (25 to 50 pages) by the discussion leader, followed by four to six additional contributed papers and a discussion. Sessions 1 through 3 are devoted to the meaning and measurement of basic soil parameters, with A. W. Bishop, P. W. Rowe, and G. E. Green each leading a session. The other sessions, titles, and their discussion leaders are: Session 4, large scale measurements of soil performance, R. G. James; Session 5, methods of solution of boundary value problems, J. B. Burland; Session 6, the relevance of laboratory measured parameters in field studies, R. H. G. Parry.

The symposium title reflects Roscoe’s call for a change in soil engineers’ outlook from an excessive concentration on shear strength to more general considerations of stress-strain behavior. Although this is a basic theme of the symposium, the tremendous emphasis on shear strength permeates the proceedings. For example, “basic parameters” invariably include φ and cohesion of soils taken from shear failure envelopes.

There are reports of testing devices which give the experimenter access to new stress paths of both practical and theoretical interest. With these devices, one of which is called an independent stress control cell (ICS), another a true triaxial apparatus (TTA), all three principal stresses can be independently controlled (unlike the conventional triaxial cell in which the minor and intermediate principal stresses are always the same).

Small-scale laboratory tests offer the best direct observation of stress-strain relations, but larger scale tests, particularly on fissured clays, do not always give the same results. This fact and others which point to the inadequacies of the present definitions of soil state, (e.g., the average void ratio of a soil sample) have stimulated the engineers’ interest in soil structure. Scanning electron micrographs are shown, and one study appears to refute the concept that mechanical stresses readily orient clay platelets and produce what some soil engineers call a flocculated structure.

In Session 5, methods of solution of boundary value problems, one can most clearly see the great practical utility of theoretical knowledge. Examples are given of both differential and integral methods, including two which utilize the critical state theory developed by Roscoe and his associates.

The book has a wealth of material which appears to reflect