patibility testing. The discussion of the last of these is an original development based, in the main, on the author's own work.

As a group the chapters on genetic models are weaker than those dealing with statistics. Some of the discussion is extremely tedious (for example, on the distribution of relatives), the tendency being toward very technical and exhaustive developments rather than toward elegant and intuitively appealing ones. There are numerous misprints, even in definitions, and a fair sprinkling of incorrect statements. In the discussion of stable equilibria under natural selection, for example, the definition given of a stable point is overly restrictive so that the argument that local maxima on the mean fitness surface correspond to stable points is fallacious.

In the statistical chapters, the writing is clear and those results which are not justified mathematically are made plausible through intuitive arguments. Certain applications of these statistics are not included, however, perhaps the most unfortunate omission being the estimation of selection coefficients and of linkage disequilibrium with multiple alleles.

This book will prove most useful to geneticists who are already familiar with the probabilistic models of their subject and who want to learn statistical procedures related to these models. A shortened version, without the sections on genetic models, would be desirable in view of the prohibitive cost of the present version and the weakness of these sections.

JOHN H. GILLESPIE
Department of Biology,
University of Pennsylvania,
Philadelphia

Geochemistry

Principles of Chemical Sedimentology. ROBERT A. BERNER. McGraw-Hill, New York, 1971. xvi, 240 pp., illus. $14.50. McGraw-Hill International Series in the Earth and Planetary Sciences.

Many of us will be happy that Berner has taken time off from his research to summarize his work and to present some new ideas to his colleagues. For the practicing scientist and the advanced student of low-temperature geochemistry, *Principles of Chemical Sedimentology* is required reading.

Most of the topics covered in the book are those that Berner has investigated and published in recent years. This is the great strength and, at the same time, a weakness of the book. For the many important topics that Berner has investigated the book offers a ready source of ideas and information. On the other hand, one cannot go to the book for a general treatment of the broader world of chemical sedimentology. To obtain a more balanced treatment of the subject, one should use Berner's book in conjunction with two other fairly recent books, *Evolution of Sedimentary Rocks* by R. M. Garrels and F. T. Mackenzie (Norton) and *Geochemistry of Sediments* by E. T. Degens (Prentice-Hall).

Principles of Chemical Sedimentology is not for beginners. A good background in physical chemistry is a necessity for appreciation of the book. The generalist, even the generalist in sedimentology, will find the going tough. For the person who has the background and interest, however, the book will suggest powerful and perhaps unfamiliar approaches to many interesting problems.

The book carries the unique signature of Berner in the treatment of the principles of kinetics. Using elementary expressions as points of beginning, he is able to predict and test the rates of such processes as mass transfer through compacting sediments, growth of concretions, nucleation and dissolution of crystals, and diagenesis of organics. In this respect he continues to pioneer in the application of the principles of kinetics to geochemistry.

A few sections of the book are outstanding for their balance, clarity, and content. Examples include the chapters entitled "Diagenetic processes" and "Formation and alteration of silica and clay minerals." Other sections, however, leave a great deal to be desired. For example, the chapter on evaporites is only 12 pages long, which is not enough space to even describe the many interesting problems in this area. Similarly, the chapter entitled "Diagenesis of Ca-Mg carbonates" fails to treat the possibility of diagenesis of carbonates and dolomitization by groundwater in the shallow subsurface, despite the fact that much interesting work has been published on this subject in recent years. In sharp contrast, a fine discussion of the deep diagenesis of clay minerals in the Gulf Coast is presented in the section on silica and clays. In light of Berner's interest over the years in the diagenesis of iron minerals, it is surprising to find that there is no treatment of Precambrian banded iron formations.

I wish Berner had omitted most of the brief section on elementary thermodynamics. At this level I think the space could have been more profitably devoted to other topics of chemical sedimentology. Some of his choices and conventions will tend to confuse rather than enlighten the beginning student. For example, he carries the symbology of partial molal quantities into his tables of thermodynamic data, without an adequate explanation. And his choice of standard state, made with minimal discussion, leads to an expression for the pressure coefficient of the equilibrium constant that is in conflict with expressions in the standard book *Solutions, Minerals, and Equilibria* by R. M. Garrels and C. L. Christ (Harper and Row). Although the book carries a publication date of 1971, the tables of thermodynamic data do not include reference to the standard compilation of 1968 by R. A. Robie and D. R. Waldbaum (*U.S. Geol. Surv. Bull. 1259*).

Typographical errors are few and trivial, and the publishers and author have done a first-class job of production.

Anyone who is particularly interested in low-temperature geochemistry should have *Principles of Chemical Sedimentology* in his office, and teachers of introductory courses in geochemistry will want to assign a few of the chapters to their students. The book could also serve as a guide for discussion in advanced seminars.

DONALD D. RUNNELLS
Department of Geological Sciences,
University of Colorado, Boulder

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