to follow them. Further, there are excellent sets of problems at the ends of the chapters and many of these problems contain answers, a pedagogical technique of which I approve. This book also has excellent drawings, graphs, and tables to illustrate the points made in the text. However, one criticism of the book's format is that the margins are unnecessarily large. Some publishers have purposely used wide margins so that notes about points to be stressed could be placed in the margin, a technique that has some merit. However, the margins in this book are practically unused.

Because the chapters are long and complex in the main, the authors have attempted to make subdivisions within the chapters by the use of frequent subject headings—an excellent technique. Although the paper stock is not so good as that used in the McLellan book, the binding is far superior. In my opinion this book should be seriously considered for use in advanced level general chemistry courses for especially selected groups of students whose backgrounds in mathematics, physics, and chemistry are significantly stronger than those of the average college freshman of 1966.

I am pleased to note that more well-written and stronger general chemistry texts have been appearing in recent years than ever before.

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Drugs and Enzymes (Pergamon, New York, 1965. 516 pp., $15), edited by Bernard B. Brodie and James R. Gillette, presents a valuable record of symposia held in 1963. The discussions by many of the speakers, most of them world reknown authorities, were so filled with solid facts and sound speculations that much of the volume is stimulating reading today; and it is also an important reference for research workers, graduate students, and teachers, despite subsequent research in most of the areas. A thorough reading should greatly increase the sophistication of the approach with which the pharmacologist attempts to relate his observations to possible cause and effect involvement of enzymes.

The first section contains 20 papers on the relationship between biochemical effects of drugs in vitro and their pharmacological action in vivo. Brodie's introduction points up important considerations not recognized in the past and not always clear to investigators today. However, it does not make clear that tentative proposals about where a drug may act are determined to a significant degree by the methods of study available or being used at any given time. The net influences of reversible binding are considered in great detail by Gillette, some in detail unnecessary for the more sophisticated but perhaps important for neophytes. McIlwain's discussion of ion movements in the nervous system seems dated, but Repke provides an excellent discussion of the cardiac glycosides and membrane ATPase. Greengaard and Giacobini give valuable reports on the relation of metabolism to activity in nerve tissue. Bacq and Liebecq present a long and complete consideration of radio-protective materials. Spector summarizes the ramifications that result from monoamine oxidase inhibition. The detailed analysis of carbonic anhydrase inhibitors (by Wirz, Maren, and Wistrand) illustrates clearly the depth of understanding we must have before we can with certainty ascribe physiological effects to an observed effect on an enzyme.

The second section contains an important and timely series of 21 discussions on biochemical mechanisms of drug toxicity. Kalow and Netter discuss the rapid increase in our appreciation of hereditary factors in individual variation and what it does to the "normal distribution" and "average dose," while Fouts, Conney, and Remmer present an extensive discussion of the adaptive changes in drug metabolizing systems and how they affect individual responses. Axelrod, Adler, and Williams thoroughly cover the conversion of substances to active drugs and to more toxic products. The papers by Horning, Poggi, and Heimberg give an extremely valuable summary of the mechanisms by which CCl_4 and certain other substances influence liver lipids. This work has added significantly to our knowledge of normal lipid transport processes. The cumulative effects of reserpine on the pituitary-adrenal system, drugs causing porphyria, and a very detailed discussion of photosensitivity to drugs are also included. The great problem in determining the biochemical mechanism when a drug such as thalidomide is converted to 12 metabolic products is carefully outlined by Faigle and his co-workers.

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Marine Sediments

Chemical Oceanography, vol. 2 (Academic Press, New York, 1965. 524 pp.), edited by J. P. Riley and G. Skirrow, deals mainly with marine sediments, a field with many unsolved problems. The first volume was concerned with sea water and its chemical interactions with marine organisms.

It is only recently that sediment cores have become available from any considerable part of the ocean and that one could begin to get an idea of the main mineral phases present. Systematic studies of separated phases are badly needed, among other things for checking the hypothesis—too recent even to have been mentioned in the present volume—that fine-grained silicates are important for determining the composition of ocean water.

Carbonates may behave quite well when studied one by one in the laboratory, but in sea water their equilibration is slow, and available equilibrium data are uncertain.

It is good to note that the various contributors to *Chemical Oceanography* aim to survey the facts that are known, and those that await explanation, rather than to advocate some pet theory of the author. Thus, the volumes may retain their value for many years to come.

In chapter 14, Ph. H. Kuenen briefly describes the geological conditions of sedimentation. R. Chester (chap. 15) tells *how* elements are distributed over various types of sediments. It is a challenge to inorganic chemists to explain *why*. K. K. Turekian (chap. 16) discusses a number of specific minerals, and age determinations for sediments. He asks this important question: Why are there not more sediments?

P. E. Cloud, in chapter 17, on carbonates, asks why dolomite does not form in the oceans, in spite of equilibrium data that would favor it (I feel the equilibrium data are wrong). Cloud gives an interesting survey of biological