ography, and on to the bathyscaphe and autonomous scaphanders. Although the treatment is concise and condensed, it is inevitable that in such a broad sweep the author may have occasionally overlooked matters that are of less interest to him than they are to some of his readers; nevertheless, Peres has done rather well in preparing an introduction to still unnavigated seas.

JOEL W. HEDGPETH
Marine Science Laboratory, Newport, Oregon 97365

Pharmacology

In **Screening Methods in Pharmacology** (Academic Press, New York, 1965. 332 pp., $12), Robert A. Turner has performed a commendable service by assembling, under one cover, a wide variety of techniques for the screening of potentially useful pharmacological agents. The book is far from being a mere list of procedures, because Turner included not only detailed descriptions of the methods employed in testing for specific types of activity, but also chapters devoted to the basic principles of screening programs. In addition, there is an appendix containing helpful statistical formulas for evaluating the significance of screening data. There is an adequate, and frequently cited, bibliography of more than 250 papers.

Unfortunately, the care with which the techniques have been assembled and described is not matched by the quality of the introductory chapter on autonomic pharmacology, or by the quality of the discussions accompanying the methodology, the general level of which is all too often below what might reasonably be expected by the research workers and educators to whom the book is directed. Little or no attempt is made to distinguish the merits or particular use of the alternative methods described, a failing that can become important—for example, when the specific use of pentylenetetrazole in screening for agents active against petit mal, as contrasted with grand mal epilepsy, is not mentioned.

More disturbing is the presence of numerous factual errors and confusing explanations. Thus the author ascribes to tryptamine the ability to displace catecholamines which is in fact possessed by tyramine. The terminal sympathetic transmitter is confusingly described as "epinephrine, norepinephrine, or a mixture of these." In the chapter on sympathomimetic agents, the author endeavors to explain the biphasic response of blood pressure to administration of epinephrine in terms of "excitatory and inhibitory properties" of the amine itself and the lower level needed for vasodepression, without recourse to the concept of alpha and beta receptors which is essential if the effect is to be understood. A description of the action of tyramine includes a statement assigning to the catecholamines the role of "catalysts" for some direct action of this compound which earlier is classified as acting indirectly.

Although the theoretical background detracts from its value, this book should prove useful, not only to those presently running, or about to initiate a screening program, but also to those engaged in the teaching of pharmacology.

WILLIAM A. CREASEY
Department of Pharmacology, Yale University

General Chemistry Textbooks

The two general chemistry textbooks reviewed here are first-rate but very different books. They are **Concepts of General Chemistry** (Davis, Philadelphia, Pa., 1965. 588 pp., $8.50) by C. R. McLellan, Marion C. Day, Jr., and Roy W. Clark and **Principles of Chemistry** (Prentice-Hall, Englewood Cliffs, N.J., 1966. 729 pp., $8.95) by Lewis G. Bassett, Stanley C. Bunce, Alison E. Carter, Herbert M. Clark, and Henry B. Hollinger.

Concepts of General Chemistry is a fine product of the authors' attempt to overcome a deficiency in general chemistry which they have noted in modern-day students—namely that many students have been learning fundamental principles but paying less and less attention to the chemical reactions that these principles seek to explain, with the result that some students "are not certain of the product of the reaction between NaOH and H_2SO_4." As a result, these authors have attempted to write a book that strikes a balance between theoretical and descriptive general chemistry. They have taken the term "general chemistry" fairly seriously and have included chapters on organic chemistry and industrial chemistry, although biochemistry is omitted. Furthermore, they have included material on topics that have become a part of the freshman curriculum, including the chemistry of coordination compounds and of the rare gas elements.

It should be emphasized that the book is definitely designed for students who have not had previous training in calculus, and the discussions of chemical kinetics and chemical equilibrium do not include mention of the calculus. The order of the presentation of the subjects is quite logical in my judgment; nuclear structure is treated near the beginning of the book, so that the influence of nuclear structure on chemical bonding can be discussed quite freely thereafter.

The book is written in a lucid style; answers are included to selected problems, of which there are a generous number, and adequate information in the form of tables, drawings, excellent photographs, and the like is included. The book is published on especially good paper stock, but the binding leaves something to be desired. This book should be seriously considered for use as the textbook in a modern general chemistry course that does not include calculus.

The *Principles of Chemistry* is much different from the book by McLellan, Day, and Clark. Of its nine chapters, one is devoted to modern inorganic chemistry and another to modern physical-organic chemistry. The remaining chapters could well be classified as "physical chemistry." In my judgment this book should not be used in a class of freshmen, unless most of them have something more than a nodding acquaintance with calculus.

The book is also well written, but is definitely for use in a course for which the students have been carefully selected with respect to their previous preparation and their ability in mathematics and science.

There is no question in my mind that the freshman chemistry curriculum is tending to be oriented more and more toward physical chemistry. This is an excellent way to introduce chemistry at the college level, provided that students have had first-rate courses in chemistry, physics, and mathematics in secondary school. For such students, this well-written book can be highly recommended. The chapters on chemical bonding, equilibrium, classical thermodynamics, and kinetics are long, but mature freshmen should be able

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.

STANLEY KIRSCHNER
Department of Chemistry,
Wayne State University,
Detroit, Michigan 48202

Second International Pharmacological Meeting, Prague

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.

F. EDMUND HUNTER, JR.
Pharmacology Department,
Washington University Medical School,
St. Louis, Missouri

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