them and do not participate in them. Pavlov made great contributions to neurophysiology, some of which have some applicability to the understanding of prison experiences, as they do to the understanding of many other types of experience; but Pavlov's hypotheses about the temperamental characteristics of dogs, and the relation of these to certain types of conditioning procedures, provide only the dimmest sort of illumination for the complex social and political phenomena of modern times.

LAWRENCE E. HINKLE, JR.
New York Hospital-Cornell Medical Center

Glossary of Geology and Related Sciences. J. V. Howell, coordinating chairman. American Geological Institute, Washington, D.C., 1957. x + 325 pp. $6.

The idea for this *Glossary* was formed in early 1950, work was started on it 1 Mar. 1953, and it was published in June 1957. With a staff of about 90 specialists, it covers some 25 geologic fields, going from "*a,* direction . . ." to "*zygote,* a fertilized egg. . . ." J. V. Howell and his group have accumulated a great number of terms, and although I have not read them all, those I have checked are well handled and correct. Lynn M. Nichols, of the *Oil and Gas Journal,* is technical editor and has edited all of them, to the betterment of the book.

There has long been a need for this *Glossary.* There are perhaps five dozen dictionaries and glossaries in which various geologic terms are defined, but this is the first one that covers the field and related sciences. (This covers some 14,000 terms.) Everyone connected with the project should feel proud of a good job well done. It is expected that this edition will be exhausted before long, and additional terms will be included in the next. We all need the book and should use it.

E. WILLARD BERRY
Duke University

Quantum Chemistry, an Introduction. Walter Kauzmann. Academic Press, New York, 1957. 744 pp. Illus. $12.

The author of this book set out to produce an elementary textbook. In this he has succeeded, with some spectacular pedagogical features. Mathematical operations for important elementary topics are written out in unusually great detail, and all pertinent mathematics is presented in connection with extremely clever examples from classical mechanics before quantum mechanics is introduced. Because of the patient presentation of the mathematical methods and because of detailed discussions of concepts, this adds up to a long book: 744 pages of small and very small type, 230 problems, 254 references, 158 figures, 47 tables, and more than 2800 equations. In spite of its length, the book is less complete in coverage, less useful as a handbook to the chemist who is using quantum mechanics in his research, and less complete in the presentation of details of advanced topics than are certain other textbooks in this field. However, as an introductory textbook for the average senior or graduate student in chemistry, this book has many extremely attractive features, and it should be widely useful.

In the first 150 pages there are problems in classical mechanics which give rise to the same mathematical operations that are met with later in quantum mechanics. For example, surface harmonics, including *s, p, d, f,* and so on, notation, is introduced in terms of the normal modes of vibration of the ocean on a completely flooded planet. Also a correlation diagram, in going from the normal modes of a square membrane to the normal modes of a round membrane, illustrates correlation diagrams in general, perturbation theory, and the reason for proper linear combination of degenerate normal modes. Similar illustrations are given for the variation method, symmetry operations, systems with strong or weak coupling, and so on.

With all difficult mathematical operations already covered in the treatment of easily visualized mechanical systems, the author is able to concentrate in the next 400 pages on the physical and chemical concepts of quantum chemistry. The topics covered are the usual ones: the Schroedinger equation and its exact solution and interpretation for simple systems, the uncertainty principle, angular momentum operators, atomic systems (two long chapters), molecules (two long chapters), van der Waals forces, and time-dependent processes. On these topics and problems the book is critical, stimulating, and up to date.

At this point, on page 546, we encounter a second book, based on the same plan as the first but carrying out this pattern less successfully. The subject of this second book is the quantum theory of light. The first 90 pages are devoted to the "classical theory of optics," largely the Lorentz theory of electrons and their interaction with light waves. The last chapter is devoted to patching up this theory with quantum considerations. Surely the author would have been excused if at the end of his book he had indulged himself in a short, difficult chapter on this, his field of research. Instead, we have a very long section which attempts to make the subject simple and easily visualized; one gets the impression that this section is artificial, specialized, and not of the same polished quality as the rest of the book.

Often a student comes up with one or another of two unfortunate attitudes toward quantum chemistry. On the one hand, he may be repelled by the mathematical details; he may want a nonmathematical version of quantum mechanics; and he may memorize several words, some of them having many syllables. On the other hand, a student may work through the treatment of the hydrogen atom and a few other cases; he is thrilled by the success of the theory, and at once he wants to hang up his laboratory apron, throw away his test tubes, and start calculating the answer to his technical chemical problems. In fine philosophic passages, Kauzmann consciously combats both of these profitless attitudes. The point is firmly made that nonmathematical quantum mechanics is like dehydrated water; the student is sternly told that he must master the mathematical methods, derivations, and operations in order to understand what has been done, what can be done, and what cannot be done with present techniques. The early optimist is warned that in spite of all the mathematics one can learn and even with high-speed computers, one does not in the foreseeable future expect quantitative theoretical solutions to routine chemical problems.

HAROLD S. JOHNSTON
California Institute of Technology

Biochemical Problems of Lipids. Proceedings of the second international conference held at the University of Ghent 27–30 July 1955. G. Popják and E. Le Breton, Eds. Interscience, New York, 1957. iv + 505 pp. Illus. $10.75.

This book is a compilation of some 69 of the 80 papers presented at the second international conference. Most of these papers are in English, but quite a few are in French and German. The breadth of subjects covered by the book is indicative of the broad field of interests in lipid chemistry.

Part I is devoted to physical and chemical properties of the lipids, methods of separation, and structures. Of special interest is the article by A. T. James and A. J. P. Martin on gas-liquid chromatography as it is used in the separation and identification of methyl esters of saturated and unsaturated fatty acids. This procedure is perhaps the most exciting in the field of lipid chemistry at the moment.

Part II is concerned with metabolism