pages. Numerous equations are skillfully placed as needed in the text. It is not easy reading because of the complete documentation; although this documentation slows the reading, it adds to the book's value.

It may surprise some geologists to realize that Nier and Gulbransen applied mass spectrometry in 1939 when they determined the 12C/13C ratio in various geologic materials. Their use of isotopes in geologic investigations opened up an entirely unrecognized area of geology. Unfortunately only a few geologists have been watching the development of this most valuable and interesting field of research, and I have heard many comments on why physicists and chemists are determining the geologic age of this or that or the temperature of fossil seas and the like.

The 80 elements covered in part II clearly show the great possibilities of the use of isotopes as applied to geology. In some cases considerable use has been made of the isotopes with which most of us are familiar, as for example, helium in measuring geologic time; heavy water; carbon-14; the isotopes of lead and their geologic implications, and several other elements. But how many geologists have considered the possibilities of using xenon with its nine stable isotopes; ^{124}Xe, ^{126}Xe, ^{128}Xe, ^{129}Xe, ^{130}Xe, ^{131}Xe, ^{132}Xe, ^{134}Xe, and ^{136}Xe, or any of the artificially produced radioisotopes with mass numbers 125, 127, 131, 133, 135, 137, 138, 139, 140, 141, 143, 144, and 145?

Xenon can be used to measure the age of uranium minerals. The xenon method can be used to measure the age of the elements and gives 7.5×10^9 years as an approximate age for them. Of course, lead has been used extensively in determining the age of the earth, and it can also be used to correlate igneous rocks. Maybe we could use praseodymium isotope; if it gives a natural alpha activity and if it is radioactive, its half-life must be longer than 4×10^{15} years. The coverage in this book is surprising.

E. Willard Berry
Department of Geology, Duke University

Vitamins and Hormones. Advances in research and applications. vol. XII. Robert S. Harris, G. F. Marrian, and Kenneth V. Thimann, Eds. Academic Press, New York, 1954. xi + 305 pp. Illus. $7.50.

In the 12th volume of *Vitamins and Hormones,* only a limited number of topics, such as vitamin B_{12}, vitamin A, the estrogens and related substances in plants and their effects on domestic fowls, and disturbances in nutrition related to liver disease in man are included. Of particular interest is the inclusion of the chapter on light regulation of hormone secretion. Although this volume should be considered essential and useful to all who are interested in recent advances in the vitamins and hormones, the following comments seem to be pertinent.

The limitation of the topic under discussion is undoubtedly motivated by the desire of the editors to exclude certain newer developments that have not "reached a stage at which they can be profitably reviewed in a comprehensive and critical manner." For example, although the chemistry of vitamin B_{12} was brought up to date, the recent studies on physiological aspects of this nutrient, such as its mechanism of absorption or its indicated uses, were omitted. The chapters on "The intestinal synthesis of vitamins in the ruminant" and "Disturbances in nutrition relating to liver disease in man" are clear and brief. In the former chapter some readers might find it more rewarding if additional information on the various hypotheses regarding the mechanism of synthesis were included.

Bacon F. Chow
Department of Biochemistry, School of Hygiene and Public Health, Johns Hopkins University

General Chemistry. W. Norton Jones, Jr. Blakiston, New York, 1954 (Order from McGraw-Hill, New York). xii + 907 pp. Illus. $6.50.

Here is a book that is different. Many teachers will want to have a desk copy—they should, because they will profit either by adopting it or by absorbing some good ideas from it as a reference book.

The arrangement of topics is a radical change from the classical sequence. Atomic structure is presented early with a very complete treatment of periodic and structural relationships. Sodium is the first element discussed, then follow "Some chemical relationships of mass and energy," "Gases," "Chlorine," "Liquids," "Magnesium," "Solids," "Aluminum," "Solutions," and so forth, on to the "Inert gases" as Chapter 41 (the last). Hydrogen is discussed in Chapter 23, and oxygen in Chapter 25.

The treatment of each topic is modern and quite complete. The level certainly is pitched to classes of better students, even though the author says in the first sentence of the preface, ". . . the text is intended for use by students of first-year chemistry and is suitable for use by groups composed both of students who have had high school chemistry courses and those who have not."

The sequence of topics may be quite teachable. I cannot pass judgment on this point; usually the verity of this assumption is affirmed only by classroom use.

In general the writing is clear, the format is good, and the exercises and collateral readings are adequate. The only weakness that might be pinpointed is the lack of good illustrations at the beginning of the book—Chapters 1, 2, and 3.

Alfred B. Garrett
Chemistry Department, Ohio State University

Perspectives and Horizons in Microbiology. A symposium. Selman A. Waksman, Ed. Rutgers Univ. Press, New Brunswick, N.J., 1955. x + 220 pp. Illus. + plates. $3.50.

In the 1930's the complaint was sometimes heard that those who studied bacteria were more interested in finding out what bacteria do than in knowing what they are. That the interests of bacteriologists have changed, and that microorganisms are now major objects of fundamental biological and biochemical study are facts that are amply illustrated by this publication.

The book contains the papers presented in a symposium held in connection with the dedication, in June 1954, of the Institute of Microbiology of Rutgers University. The far from modest title appears less pretentious when one learns that the authors of the 13 papers include some of the most brilliant minds in microbiology. The distinguished contributors are C. B. Van Niel (the microbe as a whole), A. Lwoff (some aspects of metapoietic integrations), J. Lederberg (genetics and microbiology), B. D. Davis (nutritional and enzymatic studies on microbial mutants), H. A. Barker (progress and problems in bacterial metabolism), J. W. Foster (molds as metabolic models), W. W. Umbreit (metabolic pathways), P. Wilson (pathways in biological nitrogen fixation), D. H. Peterson (microorganisms and steroid transformations), M. Heidelberger (some unsolved problems in immunology), F. L. Horsfall, Jr. (inhibition of virus reproduction by chemical substances), H. Eagle (challenging problems in antibiotic research), and R. L. Starkey (microorganisms and plant life). An appendix contains addresses by L. W. Jones, S. A. Waksman, and A. J. Kluyver [see *The Scientific Monthly* **79**, 353 (1954)].

As must be unavoidable in a symposium so broad in scope, the individual contributions vary greatly in the character of the subject matter treated as well as in style and method of presentation. For these reasons there is a notable lack of coherence in spite of an attempt to