Book Reviews

General chemistry: an introduction to descriptive chemistry and modern chemical theory. Linus Pauling. San Francisco: W. H. Freeman, 1947. Pp. viii + 595. (Illustrated.) $4.25.

This contribution of Pauling to instruction in general chemistry is one of the most interesting and stimulating books to appear in the field for many years. Its directness and freshness of approach are further enhanced by the excellent illustrations of Roger Hayward (illustrator for Strong's *Procedures in experimental physics*).

The means by which Pauling has presented the subject of general chemistry is probably best shown by including a list of chapter titles, in spite of the reviewer's aversion to such a practice. The titles are, in sequence (reviewer's italics): Chemistry; Nature and Properties of Matter; *Atoms, Molecules, and Crystals*; Elements, Elementary Substances, and Compounds; *Chemical Elements and the Periodic Law, Parts 1 and 2*; Weight Relations in Chemical Reactions; *Ions, Ionic Valence, and Electrolysis*; *Covalence and Electronic Structure*; Oxidation-Reduction Reactions; Chromium and Manganese, and Related Metals; Halogens; *Laws of Electrolysis, Electrolytic Processes*; *Properties of Gases*; Water; Properties of Solutions; Sulfur; Nitrogen; *Rate of Chemical Reactions*; *Chemical Equilibrium*; *Acids and Bases*; Phosphorus, Arsenic, Antimony, and Bismuth; Solubility Product and Precipitation; Complex Ions; Copper, Silver, and Gold; Zinc, Cadmium, and Mercury; Iron, Cobalt, Nickel, and the Platinum Metals; Tin, Lead, and Other Metals; Organic Chemistry; *Chemistry of Silicon*; Thermochemistry; Oxidation-Reduction Equilibria; Radio-chemistry.

In particular, it will be noted that the subject of chemistry is introduced by discussing the properties of substances in terms of atoms and molecules, and the development of the subject follows in as logical an order as possible, without respect to historical precedence. The chapter entitled *Atoms, Molecules, and Crystals* is a very pleasing example of the reasonableness of this approach, it being much easier for the beginning student to understand how matter is built up from atoms and molecules when they are held in a relatively stationary condition than when they are moving about randomly. Following this same reasoning, the properties of gases are not presented until Chapter 14. Electrolysis and electrode reactions are considered first in Chapter 8 for molten salts, without the complication of a solvent being present and taking part in the electrode processes, electrolysis in solutions following later. The detailed consideration of acids and bases is presented in Chapter 21, after the student is prepared for the concepts introduced. Throughout the text, where the historical background is important in itself or serves to illustrate the scientific method, it is included following the logical presentation of the subject.

No previous instruction in chemistry is assumed of the student, and each new term is defined as it is introduced. Students who have previously had high school chemistry will, nevertheless, find this book a challenging and exciting experience. Although Pauling claims that descriptive chemistry is presented in a limited amount ("... enough to provide ... an introduction to the multitude of chemical substances, but not so much as to confuse ..."), the chemistry of the elements and their compounds is discussed in sufficient detail and integrated so well with atomic and molecular structure and the periodic table, that a broad knowledge of fundamental chemical facts should be retained by the student. At the end of each chapter are a section entitled "Concepts and Terms Introduced in This Chapter" and a set of thought-provoking exercises, both of which allow the student to test his mastery of the textual material.

Occasionally new and difficult ideas are perhaps introduced in too close order. An extreme example of this (by no means typical) occurs on page 67 in defining the word *acid*. Another criticism is the treatment in the text of elements of atomic number 90–96 as transition elements, even though they are properly classed as a second rare-earth group in the periodic tables presented. The text would be much more useful for the elementary student if it were more completely indexed.

Regarding the physical make-up of the book, the typography and composition are excellent, but the binding is not reinforced and is poor. The reviewer found very few errors in typography, and only one compositor's mistake, which is a splendid record for a first printing of a first edition. This is the first volume from this new publisher to come to the reviewer's attention, and sets a high standard for subsequent publications.

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Gas turbines and jet propulsion for aircraft. (4th ed.) G. Geoffrey Smith. New York: Aircraft Books; England: Flight Publishing Company, 1946. Pp. viii + 256. (Illustrated.)

In his fourth edition of *Gas turbines and jet propulsion for aircraft*, G. Geoffrey Smith attempts to bring to light some of the major accomplishments achieved in this field in the last 5 years. With this type of propulsion fast replacing the reciprocating engines in the present military airplanes, a text containing general knowledge of the subject is most timely. The author, who has dealt with aero-engines for a great many years and who is one of the best authorities on their history and development, is well qualified to be one of the first to present such a text to the public.

The author includes not only British developments but also those of the rest of Europe and America. A great many excellent illustrations of the basic physical concepts,