General Chemistry. *P. W. Selwood*.

This book, written by a distinguished physical chemist at Northwestern University, was developed, according to the preface, for the so-called terminal course and is addressed to "that majority of students who are not potential chemists, or who are undecided about a career."

The author has made an excellent selection of topics to be covered. The atomistic rather than the historical approach has been followed, so that the first six chapters are concerned with atomic structure and compound formation, stoichiometry, the states of matter, and the kinetic molecular theory. Then follows the first chapters on descriptive chemistry, with discussions of oxygen, hydrogen, and water, by further chapters on the periodic law, kinetics and equilibrium, solutions and ionization. The material becomes descriptive again with eleven chapters on the chemistry of non-metals and metals, including a chapter on electro-chemistry. These are followed by two chapters on nuclear chemistry and atomic power, a chapter on the inorganic chemistry of carbon, and seven chapters on organic chemistry, making a total of thirty-three chapters. To some, the book may seem overlong for the group for which it is intended, but the narrative style, and the inclusion of much material of general interest, means that the ground actually covered is not as extensive as the number of pages indicates.

The material of general interest has been artfully woven into the text and is frequently heightened in interest by quotations from original investigators. These quotations cover a range from Toricelli's account of the making of barometers (p. 65) to Frasch's description of the events when the first sulfur well was put into operation (p. 212), and Loudon's tale of his experiences at the carbon dioxide-filled Valley of Death (p. 492). Other historical matter is included in biographical sketches appearing as legends to pictures of important figures.

In order that the student may separate the 'interesting' material from that which he is supposed to remember, questions are given at the end of each chapter. Emphasis is properly placed upon definitions and there are numerous questions and problems requiring thoughtful applications of known facts to interpret observations and predict results. Statements are made occasionally which must appear confusing to the student, or which may leave him with a wrong impression. Sometimes this comes from the use of a vocabulary which exceeds that of a beginning (especially a beginning non-science) student, as when, in telling what a gas is, the author states that it is not a "continuous elastic fluid." More often it comes from indefinite reference of pronouns, or from the use of phraseology which, while completely obvious to one acquainted with the subject, may mislead the student. On page 237, for example, after indicating that bromine, because of its great chemical activity, does not occur free in nature, the author apparently tells the student that it does occur free in nature, because "... the ocean contains about 300,000 tons of bromine per cubic mile of water. This is not a large concentration of bromine. It works out at less than five cents worth of bromine per ton of water to be treated. Nevertheless it is our chief source of bromine." The confusion is compounded by the fact that in the discussion of iodine, a few pages later, it is specifically stated that iodine occurs in sea water as the iodide ion. The largest producer of bromine from sea water has not used for many years the sodium carbonate absorption process described on page 258.

These and similar cases, such as the failure to tell the student why all the atoms pictured in the electronic structures of molecules on page 38ff have two or eight electrons in the outer shell (the rule of eight first appears on p. 305 as part of a discussion of the inert gases), the implication that chemical equilibrium involves the same kind of transfer of molecules between liquid and vapor as that involved in the vapor pressure equilibrium (p. 84), the failure to include in the index, for example, reference to water, or heavy water, or deuterium (deuteron does appear), are perhaps the result to be expected when a single author writes a book which is as all-embracing as a textbook of general chemistry. The organization of a book and the written material appear much clearer to the man who wrote the material than they do to a second individual who has to decide what the first was trying to do from what appears on paper. Turns of phrase which, to a single author through long association or frequent use appear universally understandable, may be caught by a second author whose childhood background and training have been different. The publication could be improved by a critical reading by someone other than the author, and it will be improved in time, if Professor Selwood's students, and particularly the teaching assistants in the course in which the book is used, are sufficiently vocal to make known the things which they object to in the presentation.