jective. Any university or industry capable of justifying an outlay of approximately $500,000 for a research reactor will certainly have on its staff one or more capable scientists who need and can make good use of a research reactor. These scientists, who will play an important part in justifying any decision to acquire a reactor, will find the technical information disappointingly elementary and of little assistance. Supporting references to the literature are not adequate to compensate for this deficiency.

The chapters on legal aspects and radiation protection are more helpful, because they present less commonly known but necessary information in condensed form, and these chapters place a very appropriate stress on the serious, important considerations of adequate radiation safeguards.

It is important at this time that extensive use and improvement of research reactors be stimulated. This book represents a timely step in the right direction, but falls short of meeting the need. It will perhaps best serve by stimulating the interest of nontechnical people.

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A Text-Book of Macro and Semimicro Qualitative Inorganic Analysis. Arthur I. Vogel, Longmans, Green, New York–London, ed. 4, 1954. xv + 663 pp. Illus. + plate. $4.50.

This excellent volume represents an extension and modernization of the third edition (1945). In the first chapter (a long one) the author presents a very thorough coverage of all the background theory required for qualitative analysis and a large amount applicable to quantitative analysis as well. Many numerical problems are worked through in detail, and the Brönsted-Lowry treatment of acids and bases is used and applied to the hydrated ions of salts. Activity coefficients and their applications are briefly discussed.

Semimicro and macro techniques are thoroughly discussed in the second chapter, which contains many illustrations of apparatus and their use. In particular, attention might be called to page 187, which contains a nicely balanced photograph of all the semimicro apparatus needed by the student. Following this are chapters on reactions and analytic procedures for cations and anions, including the use of organic reagents. For the latter, sensitivity and concentration limits are given. One might wish that the molecular equations used in these chapters had been replaced by ionic equations, but the former were probably retained to conserve space (the author asks the student to use ionic equations in his notebook).

Chapter 5 does not seem to be needed, for it is given over to systematic macro qualitative analysis for elementary students, and the same material is extended and developed in Chapters 6 and 7, dealing with systematic qualitative inorganic analysis; separations are made conventionally with hydrogen sulfide. Later chapters deal with procedures for the removal of interfering organic acids, silicates, borates, fluorides, and phosphates. A comprehensive chapter on the chemistry of the less common elements is followed by a very useful though short chapter on paper chromatography and its application to group separation and identification of ions by R_f values.

The author is head of the chemistry department, Woolwich Polytechnic, London, but the book appears to have been written in the hope that it would find service in American schools as well as British. Names and addresses of manufacturers of instruments, both in the United States and in Europe, are often given, occasionally, with the advantages or disadvantages of one make over the other. British spelling is used throughout, and American teachers considering the book for adoption will have to consider this feature, along with the European convention (opposite sign) used in electrode potentials (this is not to say that all American authors are in agreement on this point). Opposed to these features is the obvious fact that the book appears eminently teachable, and that any student familiar with this work will have a very sound background in inorganic and analytical chemistry.

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Laboratory Instruments. Their design and application. A. Elliot and J. Home Dickson. Chemical Publ., New York, 1953. 414 pp. Illus. $7.50.

This book consists of 16 chapters that cover in a limited way some of the problems of instrument building. Most of the chapters are only a few pages long; the authors devote most of the space to glass and optics. The chapter on glass contains more generally useful information than is usually found in one place. An attempt is made to include United States trade names for glasses and glass-working compounds. The chapter on lenses, mirrors, and prisms is so condensed that it is difficult to use without considerable prior knowledge of the subject. The numerous illustrations of lens, mirror, and prism arrangements, as well as tabulations of the properties of some types of lenses, could well be a source of "suggestion" to a designer of an instrument requiring a few optical parts. The treatment of subjects other than optics is superficial, and at times hardly more than a statement that the subject matter exists. The bibliography is principally of articles available only in Great Britain or in large United States libraries. British names, such as screw head, would be confusing to United States designers. The book as a whole is hardly a complete enough discussion of laboratory instruments to be useful for either instruction or reference.

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