

is shown of the change of solvents, dilution, time, and temperature on the toxicity, introduction of the methylene-sulfinic acid group and sulfur distribution.

5. A curve is given showing the acute lethal activity of a freshly prepared solution of neo-arsphenamine.

6. The introduction of a methylene-sulfinic acid group in the arsphenamine increases the tolerated dose of the arsenical from 110 mg./kg. to about 320 mg./kg. (20% of arsenic). Introduction of the second group was complicated with side reactions giving a higher toxicity.

In conclusion we wish to thank Dr. Frederick W. Heyl at whose suggestion this work was carried out.

KALAMAZOO, MICHIGAN

NEW BOOKS

Within the Atom. A Popular View of Electrons and Quanta. By JOHN MILLS. D. van Nostrand Company, N. Y., 1921. xiii + 215 pp. 36 figs. 13 × 19.5 cms. Price, \$2.00 net.

The rapid advance that has been made in the past decade or two in the investigation of the structure of the atom, and which is still in full progress, has attracted the interest not only of scientists but also of the general reading public. Mr. Mills in undertaking the extremely difficult task of presenting the experimental results and theoretical conclusions of the subject in a form that will be popularly comprehended, has gone to unusual lengths in excluding everything of mathematical nature and in introducing elaborate illustrations drawn from everyday life. The result is a very readable book which appears to serve its purpose acceptably. While no attempt is made to furnish references to the literature, the reader is familiarized with the names of the principal investigators in the various fields considered.

The author has rather wisely disregarded historical order and with the assumption of some knowledge of a few of the fundamentals of physics and chemistry begins with the presentation of the electronic structure of the atom, and passes successively to isotopes, radioactive phenomena, conduction of electricity through gases, and general electronics. Atomic numbers are introduced through a consideration of X-radiation, the quantum theory through photo-electric effects; the structure of crystals as revealed by X-rays is simply and clearly presented. The final chapter is devoted to the consideration of energy and its availability. In an appendix several pages are given to an elementary exposition of the use of the decimal exponential system of writing numbers, which though undoubtedly necessary, is a rather sad commentary on our common school methods of teaching mathematics. The appendix contains definitions, magnitudes, and discussions of various units and terms employed

in the text. An alphabetical glossary takes the place of an index and contains abbreviated definitions of the technical terms employed. A few errors have crept in. One of the most serious is the confusing, on p. 9, of the terms "half life" and "average life" in radioactive changes.

S. C. LIND

Elektrochemische Metallkunde (The Electrochemistry of the Metals). By DR. R. KREMANN, Professor of Physical Chemistry at the University of Gratz. Second volume, 1st part, 3rd section of *Metallographie*. Gebrueder Borntraeger, Berlin, 1921. xx + 656 pages; 226 figures. 18.5 × 26 cm. Price \$10.50.

This installment of over 600 large pages of Guertler's Text and Handbook of the Constitution and the Physical, Chemical and Technical Properties of the Metals and Metallic Alloys is the third section of the first part of the second volume! It aims to cover completely this particular subdivision of human knowledge, and indeed appears to do so with reasonable success.

The first section of 30 pages contains a general introduction dealing with the potentials exhibited by the pure metals, and follows the usual mode of presentation. The second section of over 400 pages, the *pièce de résistance* of the book, contains in systematic form all the existing information regarding the potentials of metallic alloys. Binary mixtures come first, followed by the ternary and polynary. Of particular interest is the summary of our present knowledge regarding the potentials of the amalgams, and the electrochemical behavior of the various sorts of iron.

The third section deals with the preparation of metallic alloys by precipitation; the fourth with the processes taking place during the electrolysis of solutions of metallic salts. In this section there is a short, but thorough discussion of polarization, overvoltage, the form of electrically deposited metals, and the production of alloys by electrical deposition, both from aqueous solutions, and from fused salts. The final (fifth) section deals with the anodic behavior of metals and metallic alloys.

The book is carefully, clearly and succinctly written. It appears to bring the various subjects right up to date, as references to the 1921 literature are frequent. Moreover, it is replete with references to the work of non-German, and particularly of American, investigators. The paper and printing are excellent.

The only serious flaw which the reviewer has noted is the method adopted for references to the original literature. Only the name of the investigator and the year are given. There is no mention of the name of the article, nor of the name of the journal in which it appeared. The editor of the Handbook as a whole (Guertler) alleges (1) that these references are adequate, and (2) that any other method would have been prohibitive in cost. The first statement shows an almost inexcusable disregard for the time and convenience of the reader, and hence a miscon-

ception of the function of a scientific publication of this kind. As regards the second statement, the number of references per page is not by any means unusually large, surely no greater than in an ordinary Journal article. An explanation of this peculiar procedure, but hardly a satisfactory one, may be found in the announcement, after the preface, that an additional volume of the Handbook will be issued, called "A Reference Book to the Literature of the Science of Metals." ARTHUR B. LAMB

The Vitamins. By H. C. SHERMAN, Professor of Food Chemistry, Columbia University, and S. L. Smith, Specialist in Biological and Food Chemistry, United States Department of Agriculture. American Chemical Society Monograph Series. The Chemical Catalog Company, Inc., 1 Madison Avenue, New York, U. S. A., 1922. iii + 273 pp. 20 fig. 23.5 × 15 cm. Price \$4.00.

When it was announced that Professor Sherman was to prepare a monograph on the vitamins, we anticipated that we should be given an excellent review of this new subject, and we were not disappointed. As was to be expected from his experience as an investigator in the field of animal nutrition and from his experience as a book maker, the treatment of the subject is comprehensive, but delightfully conservative.

Professor Sherman and his colleague, Mr. S. L. Smith, have arranged the material in 5 chapters. Chapter 1 gives an historical sketch of vitamins which is the best we have seen. In the main, it depicts the development of the subject as it has actually taken place, and as the work of many individuals rather than the product of one or two minds, as some writers would have us believe. Then follow 3 chapters, each dealing with a particular vitamin, but recognizing the possibility of the composite nature of each class. Chapter 2 treats of vitamin B (the antineuritic vitamin), Chapter 3 of vitamin C (the antiscorbutic vitamin), and Chapter 4 of vitamin A (the fat soluble vitamin). In Chapter 5 there is a discussion of the distribution of the vitamins in natural foods so far as they have been investigated. This chapter has particular value for dietitians and medical men.

An extensive bibliography is added which makes the monograph of very great value and guarantees its wide use not only by those curious only about vitamins, but by investigators in this field. The closing paragraph to Chapter 5 is worth repeating, as the exploitation of special materials for their vitamin content is unjustifiable in a properly selected dietary.

"Even with our present knowledge we believe it safe to say that with a dietary selected to make the best use of our ordinary staple foods there will be rarely if ever occasion to purchase vitamins in any other form, or to give any greater anxiety to the vitamins than to some other factors which enter into our present conception of nutritive requirements and food values."

E. B. HART