

rather haphazard way through the book) on the descriptive chemistry of the elements and their compounds, for this remains the ineluctable basis of the science, in spite of all modern advances, and, in the reviewer's opinion, provides one touchstone for assessing the value of an elementary treatise. Unfortunately the hope of discovering a presentation clearly 'correlated and systematized by new principles' was sadly disappointed. Instead there appears a jejune and in some places perfunctory treatment inferior to what may be found in a large number of well-established elementary text-books. For example, in the only reference to aluminium chloride, on p. 136, the author writes 'Aluminum chloride,  $\text{AlCl}_3$  or  $\text{AlCl}_3 \cdot 6\text{H}_2\text{O}$ , is made by treating aluminum or aluminum hydroxide with hydrochloric acid'. Throughout the book there is a distracting confusion between the accepted meanings of the terms 'basic' and 'alkaline'. The chapters concerned with the compounds of carbon ('Organic Chemistry' and 'Biochemistry') contain, in addition to such advanced subjects as an account of the author's views on the structure of proteins and some discussion of the formulae and properties of important vitamins and of high polymers, the surprising statements 'formic acid can be made by distilling ants, ... an important aromatic alcohol is phenol'.

The stress laid upon recent structural development is welcome and timely, although not unexpected from one who has himself played so prominent a part in it. From its earliest pages the whole book is pervaded by a modern structural attitude towards chemical processes, which is nowhere better exemplified than in the excellent chapter on 'Water'. A reader should, however, be aware that he would be unwise in assuming that all the structures portrayed in the numerous interesting drawings are securely based upon published experimental facts. In presenting structures for the tetra- and hexa-thionic ions on p. 368 the author gives no hint that they are controversial, and that inorganic chemists still eagerly await a settlement by diffraction methods. If Prof. Pauling disposes of evidence for such a decision it is to be hoped that he will publish it without delay. It is disappointing that an obsolete formulation for 'bleaching powder' should appear on p. 269, for the final elucidation of its true formula is a particularly apt and instructive example of the impact of diffraction technique on modern inorganic chemistry.

The classical topics of physical chemistry are treated with an agreeable freshness, which here and there degenerates into imprecision, as in the faulty explanation of the difficult term 'component' on pp. 11 and 431, and in the unfortunate choice of the system hydrogen and bromine to illustrate a photochemical chain reaction on pp. 410-11. It seems probable that Chapter 10, on 'Covalence and Electronic Structure' will prove rather stiff reading for a novice, who, following p. 49, has previously begun the study of electricity at the sealing-wax stage. The conceptions of wave-mechanical 'resonance' and 'hybridization' appear abruptly on p. 224, without any introduction or significant explanation. A welcome feature in the theoretical chapters is the excellent choice of worked examples to clarify the application of important principles, and throughout there is a wealth of informative tabulations.

The book, which is lavishly illustrated by aptly chosen figures and structural drawings, is very clearly printed

and admirably bound. Although in comparison with elementary text-books of chemistry in current use in Great Britain its price is high, none of these British books attempts to collect in the same volume all the diverse topics, germane to present day chemistry, that appear in *General Chemistry*.

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**Tables for Direct Determination of Crystal Structures.** By V. VAND. Pp. 110. Glasgow: Chemistry Department of the University. 1953. Price 14s. or \$2.00.

These *Tables* contain the structure amplitudes of 1-4 atoms in non-centrosymmetrical, and 1-10 atoms in centrosymmetrical distributions over the points dividing the translation of a one-dimensional lattice in 16 equal parts. The atoms are assumed as equal point masses. A first set of tables enumerates the possible atomic arrangements and lists the eight first structure amplitudes (of which the higher ones are repetitions). In a second set the enumeration proceeds according to increasing absolute values of the structure amplitudes for  $h = 1$ , and in case of equality for  $h = 2$  or 3, and the atomic positions are listed as they belong to the structure amplitudes.

The title of the *Tables* may appear misleading to those who hope to find in them the painless way to arrive at actual structures. The limitation to the one-dimensional case, to atoms of equal scattering power and, to some extent also, the limitation to a rather crude subdivision of the cell make these *Tables* at best the precursor of a practical tool. They are, however, of considerable value to all those who are interested in the theoretical aspects of structure determination and, in general, in the relation between crystal space and Fourier space. A further discussion of the *Tables* will be found in the article by V. Vand in this issue (*Acta Cryst.* (1954), 7, 343).

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**Anleitung zu optischen Untersuchungen mit dem Polarisationsmikroskop.** By M. BEREK; edited by C. H. CLAUSSEN, A. DRIESEN & S. RÖSCH. Pp. xiii+366 with 285 figs. and 21 tables. Stuttgart: Schweizerbart'sche Verlagsbuchhandlung. 2nd ed., 1953. Price DM. 29.00.

Diese bekannte und ausgezeichnete Einführung zum Arbeiten mit dem Polarisationsmikroskop, welche längere Zeit im Buchhandel gefehlt hatte, liegt nun in einer zweiten, umgearbeiteten Auflage vor, welche nach dem von M. Berek († 15. 10. 49) nachgelassenen Manuskript von seinen Mitarbeitern in den Leitz-Werken C. H. Claussen, A. Driesen & S. Rösch besorgt wurde. Gegenüber der 1. Auflage wurde, was durchaus zu begrüßen ist, der geometrisch-kristallographische Abschnitt wesentlich gekürzt und dafür die optischen Grundlagen eingehender behandelt. Im methodischen Teil bemerkt man mit