Book Reviews

Works intended for notice in this column should be sent direct to the Book-Review Editor (J. H. Robertson, School of Chemistry, University of Leeds, Leeds LS 2 9 JT, England). As far as practicable books will be reviewed in a country different from that of publication.

Writing scientific papers in English. By M. O'CONNOR and F. P. WOODFORD. Pp. vii + 108, Figs. 9. Amsterdam: North-Holland, 1975. Price: *f* 21.00 (about US $7.95).

This book could have quite an important influence upon the standard of presentation of scientific work. It gives advice about all aspects of writing papers for publication; although it is aimed particularly at foreigners writing in English, most English-speaking writers could learn a great deal from it as well. The fact that it is primarily directed at biologists does not in the least detract from its usefulness to physical scientists, and, if the authors of papers presented to this Journal were to accept the instructions given, the task of the Editors of this Journal would be made much easier. (For example, it is stressed that typing should be double-spaced – a request in our *Notes for Authors* that is largely ignored.)

The chapters are all very useful and could hardly be bettered. Instructions are given clearly and concisely and in unpretentious language. Grammar is treated only briefly, but the points made are those that the authors consider particularly important; we should, however, have welcomed a longer discussion of the use of hyphens, which we think could make some scientific writing a great deal less mystifying than it often is. Since English makes much use of nouns as adjectives, it is often not clear, except to the expert, what group of words is acting as an adjective to qualify a noun later on.

The only doubt that we have about the book is that it seems to make the writing of a paper almost impossibly difficult. The number of steps recommended is large; in an appendix 27 such steps are listed leading to the presentation of a manuscript. A new author may well be led to believe that his work cannot really be worth all this effort!

One chapter, however, that is of undoubted use is that on typing. This will be of great help to any typist who is relatively new to the task of preparing a satisfactory scientific manuscript.

Appendix 5 (*Expressions to avoid*) is well worth while studying. It is particularly interesting to see the words 'anticipate' and 'sophisticated' in the 'avoid' column, as these are so often used in the wrong sense.

On the whole, we think that the book should be used as a reference book rather than as a manual. In other words, we think that an author should prepare his work as he thinks best, turning to the book only when he is not sure what to do. Otherwise, he might find that he has spent so much time thinking about the presentation that he has forgotten about the contents!

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International tables for X-ray crystallography. Vol. IV. Edited by J. A. IBERS and W. C. HAMILTON. Pp xi + 366, Figs. 10, Tables 39. Birmingham: Kynoch Press, 1974. Price £ 10.

Volume IV of *International Tables* contains updated values for much of the numerical information in Volume III and also extra material concerning certain aspects of crystallography which have been extensively developed since the earlier volumes were published. The choice of the latter topics was partly due to the personal preferences of the editors and although important topics have been omitted, crystallographers will welcome the authoritative treatment of important subjects which is presented in the later sections.

Section 1 contains tables of X-ray wavelengths, one collated according to the atomic number of the elements and a second table collated in increasing wavelength. This section gives a much more extensive tabulation than is found in Volume II.

Section 2 begins with tables of X-ray cross sections and attenuation coefficients. These are followed by tables of X-ray scattering factors. New in this volume are a table of coefficients for an analytical approximation to the scattering factors giving maximum and mean errors, and a table of X-ray scattering factors of unfilled orbitals which may be used for aspherical atoms. The table of dispersion corrections for X-ray scattering factors gives what are apparently more accurate values than in Templeton's tabulation in Volume III, but no indication of accuracy or variation with $\sin\theta$ is given. The electron scattering factor tables are much more extensive than in Volume III, occupying more than one hundred pages.

Section 3 is devoted to diffractometer geometry. A series of excellent sub-sections by the late W. C. Hamilton deals with the mathematical aspects of the calculation of setting angles, the determination of an orientation matrix and measurement procedures.

Section 4 by the same author, gives a table for *R*-factor ratio significance tests and tables for analysing least-squares weights for consistency. The accompanying discussion is very valuable.

Section 5 contains mathematical articles by C. K. Johnson and H. A. Levy on the thermal motion of independent atoms and rigid bodies. The correction of interatomic distances and angles for thermal motion is also covered. A final sub-section deals with the site symmetry restrictions on the coefficients of thermal-motion tensors.

In Section 6, J. Karle discusses the solution of the phase problem by direct methods. Tables for assisting origin specification along with examples of choices of phases for the different space-group types are included. The following two sub-sections include discussions on the normalization of structure factors and phase-determining formulae. The final sub-section discusses the symbolic addition method of application of these formulae in X-ray and neutron diffraction. It is a pity that greater recognition is not given to the computer applications of the formulae that have

developed in the last ten years. Although Section 6 contains some very useful material, the clarity of presentation of the textual material is not up to the high standard of the previous sections.

In sum, Volume IV is a fine addition to the other volumes. The earlier volumes of the pre-computer era now look rather dated. One hopes that Volume IV sets a standard that will be followed by future volumes in this series.

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X-ray diffraction. By L. V. Azaroff, R. Kaplow, N. Kato, R. J. Weiss, A. J. C. Wilson and R. A. Young. Pp. xiii+664. Figs. 197, Tables 33. New York: McGraw-Hill, 1974. Price £15.10.

It is inevitable that any book which claims to provide an authoritative treatment of modern developments in X-ray diffraction will be compared with the classics of Compton & Allison, Zachariasen, James and von Laue. Indeed, the authors have assumed a prior *familiarity* with those classics; mere acquaintance with the subject matter, one quickly discovers, is not enough! While the subject matter is such that one might expect most serious students to obtain their own copies, it is clear that this book will not be used by experienced workers in preference to either the literature which it summarizes or the before-mentioned classics.

The format of the book is straightforward enough. It starts with *Scattering by Atoms* which includes elastic scattering theory, inelastic scattering theory (exclusively concerned with Compton scattering) and an updating of the experimental results obtained since the author's book. Chapter 2 on *Kinematical Theory* sets out the many approximations in useful detail and develops the theory, first for spherically averaged samples and then for single crystals. After about one hundred pages one is somewhat surprised to start at the beginning again in chapter 3. The fact that the notation changes at this point (as do the style, the mode of development and the aims) is mentioned as a footnote in chapter 4. Chapters 3–5 summarize, in about 260 pages, the wave optical theory of plane-wave and spherical-wave diffraction by perfect and nearly perfect crystals. These chapters are comprehensive and well written and, since all previous textbooks have concentrated on plane-wave theories, they constitute the only introduction available to students of the subject in book form. Chapter 6 on *Powder Diffractometry* is of similar quality, giving both a lucid introduction to the powder method and an up-to-date account of line-profile and intensity analysis. The final chapter, which aims to deal with single-crystal intensities, describes the purpose of and design criteria for single-crystal diffractometers. Sections on spectral and background control follow, but the sense of direction is lost about halfway through the chapter.

Although this book was published in 1974, there are very few post-1970 references in the otherwise ample bibliography. Apart from the very small amount of cross-referencing there is no obvious product of a collaborative effort in the text. Chapters 3–5 (Kato) and 6 (Wilson/Young) are very good but the reader whose work spans both interests is very rare. The remainder of the chapters leave one wondering for whom the book was published. The preface tells us that crystal structure analysis, X-ray diffraction instrumentation, X-ray topography and computational methods in X-ray diffraction are all subjects on which excellent books, monographs and review articles are already available. To take X-ray topography as an example (others will have their own areas of familiarity) I do not believe that to be true. Indeed, had Professor Kato added two chapters on X-ray topography, based on his already substantial contribution, then would we have had a new classic text.

There is a clear need for an authoritative text in the general area outlined by this book and by its companion volume. This is not it.

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Molecular structure by diffraction methods. Vol. 2. By G. A. Sim and L. E. Sutton (Senior Reporters). Pp. xiii+513, Figs. 92, Tables 27. London: The Chemical Society, 1974. Price £17.50.

This second volume in the series is arranged according to the same format as Vol. 1 with three parts: *Electron Diffraction*, *Neutron Diffraction* and *X-ray Diffraction*. All three parts review papers published between April 1972 and March 1973 but the period covered is extended to August 1973 for the neutron diffraction section and to mid-autumn 1973 for the electron diffraction section. Because of the shorter period reviewed than in Vol. 1 and because the electron diffraction section is this time confined entirely to structural results, Vol. 2 is considerably shorter than the 824 pages of Vol. 1. It is a measure of the inflation of book prices, however, that the smaller Vol. 2 costs more. The reduction in size does not correspond to a reduction in the number of references in all sections. The electron diffraction part discusses 139 references (compared with 464 in Vol. 1), the part on neutron diffraction reports 72 references (96 in Vol. 1) and that concerned with X-ray diffraction has 741 references on organic structures, 168 on globular proteins and 1128 on inorganic structures. (The corresponding X-ray figures for Vol. 1 were 631, 146 and 1228.)

Throughout Vol. 2 there are useful references to Vol. 1. Diagrams are used liberally to supplement descriptions in the text and the many tables provide valuable numerical correlations. The team of Reporters is practically the same as for Vol. 1 and they are to be congratulated on having discussed so much factual information in a way which is concise and yet readable. There seem to be remarkably few errors. Every reader is bound to find some sections of the book which are particularly fascinating for him. For the reviewer, one of the most interesting features is the way in