then it can easily be demonstrated that the instrument will not be stable to variations in the intensity of the lamp. Some microdensitometers make use of coloured filters and slits to isolate the regions of interest on a film. On these instruments it is essential to insert filters of the same colour into both beams.

The bulb life should be long to avoid the inconvenience of frequent renewals.

It should be possible to illuminate the film from the back to study the features on it by eye.

The instrument should be stable to changes in the light of the room in which it is being used.

Electrical. There should be good diagnostics for electronic faults and the machine should not be affected by minor variations in mains voltage. It should cut out if spikes in the mains voltage occur.

Computational. It should be easy to interface the instrument to a computer. If the instrument is computer controlled, it should have diagnostic test programs to check its performance.

Mechanical. If a large amount of data is being collected on an instrument connected to a slow output device, such as a paper tape punch, then this punch may become a constraint on the speed of the whole system. It is important to match the type of output peripheral to the anticipated volume of data to be output. It is also worth noting that paper tape punches are liable to break down quite frequently if they are subject to long heavy continuous use.

Table movements must be accurate, reliable, and well calibrated in both directions.

The moving wedge on a double beam microdensitometer may be connected to the servo motor by a flexible drive. If this is the case, the drive may stretch with use, or with variations in temperature.

Operational. When setting up a densitometer, it is useful to get a display of the results being obtained. On some densitometers this information is output on a printer as an array of numbers, so that it can be related to the orientation of the film.

Conclusion

It is hoped that the points made above will help to improve microdensitometer design, and make potential users more aware of the problems that they may encounter.

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Reference

Ferrier, W. G., McMullan, J. T. & Sutherland, D. C. (1973). *J. Phys. C*, **6**, 1489–1499.

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Use of high and low temperature attachment for Weissenberg camera

When using an attachment to the Nonius Weissenberg camera for temperatures between −150 and 300°C (Kreuger, 1955) it is advantageous to connect an air pump rather than a cylinder of compressed gas to provide the stream to be heated or cooled. The crystal should be enclosed in a capillary tube if it is liable to deteriorate in a flow of cold or warm air. Air-pumps sold for use in an aquarium can be adjusted to a flow rate of about 3 litres/min ($5 \times 10^{-6} m^3 . s^{-1}$) through the camera, measured by an air-flow meter. This gives temperature control which is at least as satisfactory as when gas from a cylinder is used, and is certainly more convenient for unattended operation over long periods.

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Reference

Kreuger, A. (1955). *Acta Cryst.* **8**, 348–349.

Crystallographers

This section is intended to be a series of short paragraphs dealing with the activities of crystallographers, such as their changes of position, promotions, assumption of significant new duties, honours, etc. Items for inclusion, subject to the approval of the Editorial Board, should be sent to the Executive Secretary of the International Union of Crystallography (J. N. King, International Union of Crystallography, 13 White Friars, Chester CH1 1NZ, England).

Professor **A. Guinier**, Professor **R. Uyeda** and Professor **E. R. Wölfel** have resigned as Co-editors of *Journal of Applied Crystallography*. Professor Guinier was Editor of the journal from its creation, in 1968. Following his election as President of the Union in August 1969, he relinquished his role as Editor from the end of that year but continued as a Co-editor. Professor Uyeda and Professor Wölfel had been Co-editors from the start of the journal. Professor **J. C. Joubert**, Ecole National Supérieure d'Electrotechnique et de Génie Physique, Grenoble, France and Professor **D. Watanabe**, Tohoku University, Sendai, Japan, have been appointed Co-editors. Their full addresses are given on the inside front cover of this issue.

Dr **F. H. C. Crick**, Medical Research Council Laboratory for Molecular Biology, Cambridge, England, has been awarded the 1975 Copley Medal of the Royal Society for his elucidation of the structure and function of DNA and his continuing important contributions to molecular biology.

Professor **D. C. Phillips**, Department of Zoology, University of Oxford, England, has been awarded a Royal Medal for 1975 in recognition of his solution of the three-dimensional structure of an enzyme and his outstanding contributions to the techniques of X-ray crystallography. Three Royal Medals are awarded annually by Queen Elizabeth upon the recommendation of the Royal Society.

Mr **G. N. Hounsfield**, E.M.I. Limited, has been awarded the Dunddell Medal and Prize by the Institute of Physics, for his outstanding developments in the use of X-rays for the examination of three-dimensional structures.

International Union of Crystallography

International Tables for X-ray Crystallography

The Executive Committee of the International Union of Crystallography has found it necessary to increase the prices of the four volumes of the present series, which are published for the Union by The Kynoch Press. Volumes I, II and III will now cost £9.50 per volume whilst Volume IV, which was published in September 1974, will cost £11.50. Orders may be placed direct with The Kynoch Press, Witton, Birmingham B6 7BA, England, with Polycrystal Book Service, P.O. Box 11567, Pittsburgh, Pa. 15238, U.S.A. or with any bookseller.

Preferential prices for *bone fide* crystallographers, who must give a written undertaking when purchasing a volume that it is for their own use only, have been increased to £5.00 for Volumes I, II and III and £7.00 for Volume IV. Orders for volumes at preferential prices must be sent direct to The Kynoch Press or Polycrystal Book Service, from whom prospectuses are obtainable. All prices include postage.

Notes and News

Announcements and other items of crystallographic interest will be published under this heading at the discretion of the Editorial Board. The notes (in duplicate) should be sent to the Executive Secretary of the International Union of Crystallography (J. N. King, International Union of Crystallography, 13 White Friars, Chester CH1 1NZ, England).

ACA Special Interest Group on Small-Angle Scattering

This Special Interest Group of the American Crystallographic Association has been established with the following Board of Directors: H. Brumberger (Chairman), P. Geil, R. W. Hendricks, P. W. Schmidt, B. P. Schoenborn, L. B. Shaffer. Enquiries about the Group should be directed to Dr H. Brumberger, Department of Chemistry, Syracuse University, Syracuse, New York 13210, U.S.A.

A two-session symposium on small-angle scattering will be held at the next meeting of the ACA to be held at Evanston 8–13 August 1976 (for details see the *Calendar of Events* section). The invited papers being presented will be on neutron diffraction analysis of oriented lipid bilayers (B. P. Schoenborn) and small-angle diffraction at the Stanford Synchrotron Radiation Project (R. M. Stroud).

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 LS2 9JT, England). As far as practicable books will be reviewed in a country different from that of publication.

Topics in applied physics, Vol. 5. Mössbauer spectroscopy. Edited by *U. Gonser*. Pp. xviii + 241. Figs. 96. Berlin, Heidelberg, New York: Springer-Verlag, 1975. Price DM70, US $28.70.

This volume contains six essays on different aspects of Mössbauer spectroscopy, each written by a well known scientist actively working in the field, and compiled under the editorship of Professor Uli Gonser. As each contribution is essentially an independent entity, it is convenient in the first instance to discuss them individually.

The first chapter by U. Gonser presents the historical background to Mössbauer spectroscopy. The physical principles are introduced simply, with the minimum of mathematics but with a thorough explanation of the concepts. Similarly the principal hyperfine interactions are described using the simplest forms of the equations. Unfortunately the brief foray into combined effects is more difficult to follow, largely because of the lack of illustrated examples. The treatment of experimental techniques is straightforward, apart from the last section on polarization effects which, although interesting, seems to have been included at the expense of more widely used experimental techniques such as the application of an external magnetic field.

The second chapter by P. Gütlich attempts to survey the applications of Mössbauer spectroscopy to chemistry. It commences by reintroducing the principal hyperfine interactions in greater mathematical detail (in some 14 pages), although one feels that this should have been convered once and for all in the first chapter to avoid duplication. The remainder of the chapter is divided equally between a detailed discussion of isomer shift data and of the quadrupole splitting. The emphasis is placed upon iron compounds, but some reference is made to other elements. The chapter as a whole does not contain a single pictorial example of a Mössbauer spectrum, and this contributes to a feeling of frustration when, having seemingly digested the basic ideas, one is confronted with a long concluding list of tantalizing applications (including for example the study of surface reactions, frozen solutions, phase transitions, dynamic processes, *etc.*) without a single example. One might consider many of these topics to be highly relevant to any text on applied physics.

The third chapter by R. W. Grant gives an excellent account of the determination of magnetic structure from the combined magnetic–quadrupole interactions, and includes several examples where polarized radiation has been used. Although some of the equations are very complicated, they can be skipped over at first reading. It is a pity that no examples have been given for isotopes other than ^{57}Fe, and more reference to magnetic exchange interactions in non-stoichiometric materials and solid solutions would have enhanced the chapter considerably.

The fourth chapter by C. E. Johnson is probably the best, and is concerned with applications in biophysics. The account centres on the haeme and iron–sulphur proteins, and conveys the essential details in an interesting and lucid style without being sidetracked by the theoretical complexities involved in the analysis of the data.

The fifth chapter by S. S. Hafner discusses the Mössbauer spectra of soils and rocks obtained from the lunar surface by the Apollo and Luna missions. Much of the information has been hitherto buried in weighty conference reports and the geological literature, and this critical evaluation will be much appreciated by those who are not active in the field of lunar science.

The final chapter by F. E. Fujita describes applications to physical metallurgy. Many examples are given, and it is pleasing to find these discussed in terms of their relevance from the point of view of a metallurgist. The adoption of this approach makes the chapter well worth reading.

The overall standard of the book is high. Inevitably there are the usual problems arising from a multi-author publication such as duplication of essential introductory material, but in general the editorial supervision appears to have been good. Extensive references to the original literature are given in all chapters; there is an index, and a master reference list of symbols is provided. The selection of topics gives a fairly wide coverage of Mössbauer spectroscopy, but it is to be regretted that discussion has been restricted almost entirely to the ^{57}Fe resonance. While this was inevitable in chapters four and five, it creates an artificial bias in the other chapters. Nevertheless, this book is an essential acquisition for the library, and hopefully the price is low enough to tempt the individual buyer.

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X-ray spectroscopy. Par *L. V. Azaroff*. Pp. xii + 560, Figs. 154, Tableaux 8. New York: McGraw-Hill, 1974. Prix £11.00.

L'objectif du livre d'après l'éditeur, est de présenter non une synthèse mais 'an up to date description that should enable the reader to learn what is already known and to discover where many interesting problems still remain'. Ce double but fait que l'on ne doit pas chercher dans ce volume une oeuvre susceptible de rem-