

as the principal experimental tool. He was active in helping to organize the Pittsburgh Diffraction Conferences over many years. He was a great farmer and kept his friends well supplied with vegetables in the summer. Bettie's herb garden was equally appreciated, as were their summer picnics. He left Pittsburgh when he retired to live in Louisville, Ohio, and both he and Bettie were missed, particularly by the Pittsburgh crystallography community and their many friends.'

Professor **C. A. Taylor**, formerly Professor of Physics at University College, Cardiff, is the first recipient of the Michael Faraday Award for the furtherance of the public understanding of science. The award has been created by the Royal Society. Professor Taylor receives the award for his outstanding presentations of physics and applications of physics to the real world, aimed at all ages from six-year old primary school children to adults.

Professor **David H. Templeton** and Dr **Lieselotte K. Templeton**, Chemistry Department, University of California, Berkeley, California, USA, are the joint recipients of the third A. L. Patterson Award for their pioneering contributions to the understanding of anomalous scattering of X-rays. During the last ten years they have been engaged in the accurate measurement of anomalous-scattering terms at wavelengths near absorption edges and have co-authored many important papers.

Professor **M. Vijayan** of the Indian Institute of Science, Bangalore, has been awarded the Bhatnagar Prize of the Council of Scientific and Industrial Research, India, for his contributions to crystallographic studies on proteins and complexes of amino acids and other small molecules.

Professor **M. Vijayan** of the Indian Institute of Science, Bangalore, and Dr **K. K. Kannan** of the Bhabha Atomic Research Centre, Bombay, have been elected to the Indian National Science Academy in recognition of their contributions in the field of biological crystallography.

Professor **M. A. Viswamitra** of the Indian Institute of Science, Bangalore, has been awarded the triennial J. C. Bose Medal of the Indian National Science Academy for his work on crystallization and structural studies on oligonucleotides.

New Commercial Products

Announcements of new commercial products are published by the Journal of Applied Crystallography free of charge. The descriptions, up to 300 words or the equivalent if a figure is included, should give the price and the manufacturer's full address. Full or partial inclusion is subject to the Editor's approval and to the space available. All correspondence should be sent to the Editor, Professor M. Schlenker, Editor Journal of Applied Crystallography, Laboratoire Louis Néel du CNRS, BP166, F-38042 Grenoble CEDEX, France.

The International Union of Crystallography can assume no responsibility for the accuracy of the claims made. A copy of the version sent to the printer is sent to the company concerned.

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Variable-Temperature Hall Mobility Measurements

A **variable temperature cryostat** for the **HL5200 Hall Measurement System** is now available.

The use of just two temperatures (room and liquid nitrogen) allows Hall measurements to be performed rapidly and routinely. However, for more demanding applications, a variable-temperature cryostat allows Hall measurements to be made over the temperature range 80–400K. The cryostat is software controlled to an accuracy of ± 0.5 K and a stability of ± 0.05 K.



The Polaron cryostat for the HL5200.

Polaron Equipment Ltd, 53–63 Greenhill Crescent, Watford Business Park, Watford, Herts WD1 8QS, England

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100 years of apochromatic high-performance optics from Carl Zeiss

In 1886 Carl Zeiss launched the first apochromatic microscope objectives. In these objectives 'free from colour traces', the residual chromatic aberration ('secondary spectrum') present in conventional objectives was corrected by a complex sequence of lens elements. This made it possible to obtain true-to-colour images in the microscope even at very high magnifications.

The physicist Ernst Abbe – the then partner of Zeiss and the subsequent founder of Carl Zeiss Stiftung – only succeeded in designing these complex lens systems after years of painstaking calculations. Completely new types of glass also had to be developed.

The lenses of other optical instruments were also apochromatically corrected by Zeiss at a very early stage. In 1899 Max Pauly incorporated an apochromatic objective in a telescope. And when the Zeiss Tessar lens designed by Rudolph began its triumphal march in photography in 1902, an Aplanat-Tessar 1:10 for true-to-colour reproduction already existed.

In 1938, Plan-objectives with flat fields for photomicrography were designed for microscopes, a development which was to culminate a few years later in the legendary Planapochromats from Zeiss. After 100 years of experience in apochromatic high-performance optics with some outstanding highlights along the way, no end is yet in sight to development in this field.

Carl Zeiss Oberkochen, Postfach 1369/1380, D-7082 Oberkochen, Federal Republic of Germany

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.

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Kristallstruktur und chemische Bindung. By **A. Weiss** and **H. Witte**. Pp. xii + 396. Weinheim: Verlag Chemie (VCH Verlagsgesellschaft), 1983. Price DM98.00.

The main goal of this volume is a combined representation of the chemical and physical properties of the solid state and of its methods of investigation. The authors, Alarich Weiss and Helmut Witte have succeeded authoritatively in doing this.

The first part gives an introduction to basic crystallography, considering metrics and symmetry of the crystal lattice as well as of the single unit cell, and a survey of traditional models of chemical bonding in the solid state. The main part of the book is a well arranged summary of established techniques of solid-state investigations. The X-ray scattering chapter offers an extensive exposition of photographic methods but lacks a more detailed description of a full single-crystal structure determination as practised today. No mention of direct methods is made. Also missing is the determination of the absolute config-

uration by anomalous-scattering techniques. On the other hand, spin resonance methods are presented in a very clear and easy-to-follow way. The section continues with Mössbauer spectroscopy, optical spectroscopic methods of solid-state investigation, IR spectroscopy, X-ray photoelectron spectroscopy, Compton scattering and spin distribution. Further chapters deal with the concept of lattice energy, Bloch's bonding theory, magnetic and electric properties, the anisotropy of bonding in the solid state and lattice dynamics. A special section is dedicated to lattice defects and to a discussion of their formation. A final chapter summarizes the properties of polymers and of amorphous solids. The 380 pages of German text are followed by an appendix containing tables of atomic and ionic radii observed in different bond types and a list of all the references. The non-conventional index has the advantage of connecting each ref-

erence to its author by a special letter code but lacks an easy overview of the sections.

The book primarily serves as a well founded general introduction to solid-state chemistry and chemical crystallography. It may be especially recommended to chemistry students whose curriculum does not include X-ray crystallography. Those, however, seeking an introduction to crystal structure determination will need an additional and more specialized textbook. The volume will also be a welcome source of information for teachers who want to include certain chapters on the solid state and its methods of investigation in their general chemistry courses.

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Books Received

The following book has been received by the Editor. Brief and generally uncritical notices are given of works of marginal crystallographic interest; occasionally a book of fundamental interest is included under this heading because of difficulty in finding a suitable reviewer without great delay.

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Synthetic modulated structures. Edited by Leroy L. Chang and B. C. Giessen. Pp. xi + 502. Academic Press, 1985. Price US \$87.00, £76.00. A review of this book, which covers synthetic semiconductor and metal multilayers, their growth and characterization, and theoretical aspects of their properties, together with some device results, and predicted future trends, by P. F. Fewster has been published in the March 1987 issue of *Acta Crystallographica*, Section A, page 288.