The availability of highly oriented pyrolytical graphite (HOPG), a polycrystalline synthetic graphite with a common *c*-axis direction, as a waste product from X-ray monochromator production, permits the measurement of second-rank tensor properties on samples that are easily characterized by X-ray diffraction.

Electrical conductivity is the most commonly investigated second-rank tensor and the existence of pressure-induced discontinuities in the *c*-axis electrical conductivity, is reported here. Clearly pressure must now be recognized as an important parameter in controlling the physical properties of these compounds.

However, most of the experimental papers report either a property measurement at atmospheric pressure or use a combination of techniques to probe important structural parameters such as the amount of charge transfer between the intercalate and matrix structure. Thus there are papers dealing with the thermal conductivity, the *c*-axis velocity of sound and the low-temperature specific heat, as well as electrical conductivity and superconductivity. The impressive array of techniques used to probe structure include a range of spectroscopic techniques, (Raman, UPS, XPS, LEPS, SES, and Mössbauer), magnetic resonance studies (NMR and EPR), positron annihilation, Shubnikov–de Haas oscillations and inelastic neutron scattering.

The theoretical papers cover a range of topics, many of which parallel those of the instrumentalists. Thus significant progress is reported in the understanding of the band structures in the first-stage alkali-metal compounds C_8M. Other theoretical studies cover the origin and consequences of staging as well as predicted bond lengths and phonon spectra in graphite intercalation compounds. The problems of order–disorder transformations and ionic mobility are addressed by papers dealing with the behaviour of charged species in two- and one-dimensional periodic potentials. One-dimensional systems are also considered by experimental and theoretical papers dealing with polyacetylene.

Finally, this review cannot claim to be comprehensive but merely identifies themes of interest to the non-specialist reader. Such people should be aware that this book is essentially a progress report in its chosen field and that it will be necessary to consult the many references in order to get a balanced view of the physics of intercalation compounds.

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The spindle stage: principles and practice. By F. Donald Bloss. Pp. xii + 340. Cambridge University Press, 1981. 15 × 23 cm. Hard covers. Price UK £35.00 (net).

This textbook is not the first one (nor probably the last) to be written by Professor Bloss, the optical crystallographer, mineralogist and crystallographer at the Virginia Polytechnic Institute and State University. Its purpose is to teach students how to use a one-axis universal stage to obtain a complete and accurate optical description of any transparent crystal. The method rests on a simple principle: any biaxial crystal mounted *at random* on a rotation axis (S) lying in the plane M of the microscope stage can have its three optical directions α, β, γ successively brought into the plane M by appropriate rotations about S. Further rotations about the microscope axis (nicols crossed) reveal the extinction directions. It indeed follows that 'anisotropic crystals become amazingly tractable'. All optical properties are obtained by the immersion method. Examinations can be made in convergent as well as parallel light.

The *Table of contents* reveals a practical outlook. The presentation begins with a description of the equipment and the techniques of measuring and plotting. Major improvements of the commercially available spindle stage over its 1860 prototype are: the detent feature (indentations of the S half-circle graduation at 10° intervals) and the interchangeability of oil cells. The Wulff stereographic net, used for plotting data, is oriented with its great circles intersecting in the EW diameter, with which the S axis is made to coincide. In the next two chapters the above techniques are applied to uniaxial and biaxial crystals respectively. Then the author recalls the methods of altering the index of immersion oils by varying wavelength, temperature or both. These methods are more easily applied with the spindle stage than with the universal stage, for which they were developed. Extrapolation methods, though never used here for purposes of orientation, are applied whenever the refractive indices of the crystal lie outside the range of the immersion oils. Chapter 5, on accurate measurements of the principal indices, gives due warning of all concomitant pitfalls. We learn of an inexpensive, but serviceable, refractometer consisting of a calibrated reference crystal permanently mounted on a separate spindle stage; it and the crystal under study are bathed in the same oil at the same time. The estimated error on the value of the index ranges from $\pm 0{\cdot}0002$ to $0{\cdot}0005$ – an improvement of one order of magnitude over current practice. Chapter 6 explains how to sharpen extinction positions. It also describes a computer program, *EXCALIBR*, which derives the orientation of the indicatrix from measured angular coordinates, calculates $2V$, locates optic normal and bisectrices, and determines dispersion.

Chapter 7 is headed *Combined optical and X-ray studies of crystals*. Bloss's Detent Spindle is now replaced with a Supper Spindle equipped with its standard goniometer head; both adjustment arcs being set at zero, optimal measurements are carried out as before. By means of the arcs a symmetry direction is then brought along S, and the crystal is ready for transfer on its goniometer head to the rotation and Weissenberg instrument. A second symmetry direction, perpendicular to S in the plane of the microscope stage, serves for alignment for transfer to the precession camera. The Donnay Optical Analyser, which, according to Bloss, could be used instead of the Supper Spindle Stage, seems ill-suited for the procedures here described: it carries its own nicols and is too bulky to fit on a polarizing microscope stage.

Chapter 8 takes up path-difference measurements and their use in calculating birefringence. It is followed by an *Epilogue*, telling of applications of the spindle stage to various problems that have met with success: for instance, the relation of the ratio (Fe + Mn)/(Fe + Mn + Mg) to the refractive indices of cordierite; the re-determination of the transitions in the low plagioclase series. Three appendices give: (*A*) formulae to solve spherical triangles and some proofs omitted in the text; (*B*) more details on the *EXALIBR* program; (*C*) the derivation of Joel's equation and the $\cos 2V$ formula. Finally, answers to the 19 problems proposed in the text, 44 footnotes collected under *Notes*, a list of 90 references and a six-page index complete the volume.

The book should be a companion volume to the author's *Optical crystallography* (1961), definitely a prerequisite for *The spindle stage.* Such basic material should find a place in every science undergraduate curriculum. Its actual presentation assumes very little (not even the 'vector dot product'); on the whole it proceeds at a leisurely pace and gives the directions for use in minute detail, with over 160 accurate drawings excellently reproduced, graphic solutions, tabulations to facilitate calculations and nomograms to dispense with them. In short the job of imparting the 'know-how' is superbly done. As to the 'know-why', some proofs are left out and the clarity of the text occasionally suffers from the superabundance of details. The best explanation is often found in the small print of the lengthy figure legend, where a specific example is thoroughly thrashed out. The author must agree with us, for he sometimes refers the reader from the text to the legend! Professor Bloss is aware of the duplication, which he dubs the 'double coverage', but he says in its defense (p. xii) that he used it before and 'most students ... truly appreciate the practice'. Every good teacher will accept this argument.

As to book-making, printing and binding, this volume deserves the highest marks.

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Crystallography. By R. STEADMAN. Pp. viii + 120. Wokingham, England: Van Nostrand, 1982. £3·95.

The aim of this book, according to the author, is to provide a workmanlike knowledge of crystal geometry and the ability to interpret X-ray powder photographs and electron diffraction patterns. In this he succeeds very well, however, at a price. For applying the proper techniques in the interpretation of diffraction diagrams and the deduction of simple Bravais lattices the book is an excellent guide, but it presupposes a proper theoretical background or at least a general discussion of diffraction methods. It is only then that the book comes into its proper right, demonstrating the simplicity of the underlying ideas of crystallography and diffraction theory. Used by itself, the student at one end of the scale – the very intelligent one – will feel frustrated, whereas the student at the other end of the scale will become overconfident.

Any student using this book as supplementary reading, along with a theoretical text, will be highly rewarded and, as such, this little book has great merits.

The cost of the book, £3·95, is not too high and students will find it well worth the price.

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Recent developments in condensed matter physics, Vol. 1. Edited by J. T. DEVREESE. Vol. 2. Edited by J. T. DEVREESE, L. F. LEMMENS, V. E. VAN DOREN and J. VAN ROYEN. Pp: Vol. 1, xvii + 856; Vol. 2, xvii + 447. New York: Plenum, 1981. Price: Vol. 1, US$85.00; Vol. 2, US$59.50.

These two volumes are the first of a set of four which contain the proceedings of the first general conference of the Condensed Matter Division of the European Physical Society. The conference was held on 9–11 April 1980 in Antwerp.

The first volume contains fifty-four invited papers presented at this forum. The second volume consists of a collection of approximately one-third of the contributed papers.

The conference was organized to provide, in Europe, a setting similar to that of the popular 'March Meeting' of the American Physical Society. In this the organizers have evidently succeeded. They have brought together a large cross section of current condensed-matter research, and they have gone one step further in providing for the publication of these interesting proceedings – something which is not attempted in conjunction with the somewhat larger March Meeting.

The invited papers nearly all fall into one of two categories. They either provide a review of the long-term development of a particular field, or they offer a summary of recent, outstanding efforts of a group of investigators involved in a topic of current interest. Professor A. Abragam reviewed methods for producing and observing antiferromagnetic and ferromagnetic states of nuclear spins in dielectric crystals – an area in which he pioneered. Eric Karlsson and Dierk Herlach each present a detailed development on the use of positive muons in metal physics, together with results involving defects in metals.

Most of the invited contributors took their task seriously, and the result is a collection of well-considered and well-written papers. The presentations are such that they attract the interest not only of the specialist but they also capture an attentive audience from neighboring disciplines.

As is the case in much of condensed-matter physics in the United States today, a large fraction of the scientific effort in Europe is directed towards new classes of materials and on the special properties of low-dimensional systems. An increasing amount of attention is going toward amorphous