1984 and sponsored by the Mineralogical Society, the British Ceramic Society, the Institute of Physics and the Polar Solids Discussion Group at the Royal Society of Chemistry. This symposium sought to review some of the recent developments and achievements in experimental and theoretical techniques for characterising the defect and transport properties, and to illustrate the range of problems encountered in the various disciplines—in both academic and industrial environments. The thirty-one papers are collected under five headings: characterisation, kinetics, modelling studies, mass transport and industrial topics. [M.A.87M/0572-0602]

R. A. HOWIE

Boisen, M. B. and Gibbs, G. V. *Mathematical Crystallography: an introduction to the mathematical foundations of crystallography.* Washington D.C. (Mineralogical Society of America: Reviews in Mineralogy, Vol. 15), 1985. xii + 406 pp. Price $18.00.

The mathematical foundations of crystallography treated in this book are of two kinds. The first (treated in chapters 1–3 and apendices 1–5, amounting to just less than half the book) is the kind of mathematical foundation needed by a crystallographer if he is to take advantage of the essential simplicity of treating crystallographic problems by vector and matrix methods, rather than the trigonometric methods that are being relegated to the past. Such a crystallographer will find here an excellent introduction to the mathematics involved, and one which is wholly relevant to his purpose. There are plenty of exercises provided for anyone using the book as a self-teaching manual, and they are interspersed in the text so as to press home each development of ideas as it occurs. One only wishes that answers were provided to more of them.

The second kind of foundation treated (in chapters 4–7 and appendices 6–8) is the kind that most people prefer to leave buried and undisturbed while they live in the superstructure built on it. This is the mathematical theory and proofs of the existence of the 32 point groups, the 14 Bravais lattice types, and the 230 space groups. Not many practising crystallographers need, or wish, to pursue the subject to this depth, though it would be an excellent preparation for those who aim to follow, or contribute to, current work on modulated crystals and quasi-crystals.

The book has very few misprints or other blemishes. The worst is the orientation of the component drawings of the stereoscopic pairs illustrating the point groups: the principle of them is excellent, but because the $y$-axes have been set horizontal on the page instead of the $z$-axes being set vertical, none of them looks orthogonal when viewed stereoscopically. It is a pity that the authors have used the same word (system) for the concept involved in *both* the six crystal families and the seven crystal systems. However, these are minor matters, and I only wish that this excellent book had been available to me 30 years ago. It is curious that a book with the same main title and with much the same scope was published by H. Hilton in 1903: the crystallography was the same, only the mathematical foundations have changed.

E. J. W. WHITTAKER

Graham, A. L., Bevan, A. W. R. and Hutchison, R. *Catalogue of Meteorites: with special reference to those represented in the collection of the British Museum (Natural History), IVth Edition.* London, British Museum (Natural History), and Tucson (University of Arizona Press), 1985. xii + 460 pp. Price £38·50.

This replaces the 1966 Catalogue by Hey and the 1977 Appendix by Hutchison, Bevan and Hall. It is based on a computer file and is presented as a tribute to Max Hey who hand-crafted two earlier editions. Users of the 1966–77 works will naturally move up to this, but should not allow those earlier volumes to be mislaid, since they contain a measure of information which has now suffered deletion.

In style and format, the new pages are twice the size, laid out in double columns and without the benefit of the old emphatic differences of type face. Even the geographical coordinates have been restyled. The content has been influenced by developments such as the publication of Buchwald's monograph, the reclassification of stones by petrological criteria and a simpler view of their chemistry and the unearthing (?) of the Antarctic hoards.

Although it retains its sub-title relating to the B.M. collection, it has lost its ancient 'History of the Collection' and is very much the standard international work of reference. The Trustees of the British Museum deserve the gratitude of the space community for underwriting this work and it is important that the effort be continued toward the production of later editions. In 1914, just about a biblical lifetime ago, Lazarus Fletcher produced the eleventh edition of his 'Introduction to the study of meteorites with a list of meteorites represented in the Collection'. In 125 pages and at a price of one shilling it stands opposite the present work—providing historical book-markers for a generation of meteorite studies. With both volumes to hand

the meaning of progress becomes uncomfortably clear.

HOWARD AXON

Wilson, H. E. 1985. *Down to Earth: One hundred and fifty years of the British Geological Survey.* Edinburgh and London (Scottish Academic Press), 1985. iv + 189 pp., 5 figs., 24 photos. Price £9·75 (paperback only).

There have been three principal histories of the Geological Survey: in 1937 Flett published a solid official version; Bailey's account in 1952 was almost as much a history of geology in Britain as about the Survey itself. Now Harold Wilson has written the third to celebrate the 150th anniversary. Happily it is free from the restrictions of a government publication. Although we are given details of all the formal changes in the organisation, they are put into the context of the personalities of the time. For each period and sector one can get the feeling of what it must have been like to be working in the Survey. This is a first-class, entertaining, yet scholarly history, reaching a standard seldom achieved by the professional historian (though it is a pity that there is no index).

Particularly good for many readers will be the independent account of the feud between the fierce Flett and E. B. (Batty) Bailey. It was their misfortune, but entertaining for us, to be brothers-in-law and to have had to work together in the Edinburgh Office from 1911 to 1920 (except while Bailey was winning an M.C. in France) and during this time they came to hate one another. Both men of exceptional intelligence and energy, Flett could turn his hand to anything (physics, Greek, logic, English literature, political economy, fishing, medicine, chemistry; he studied all these whilst at Edinburgh University, and won prizes in most of them); but he lacked that imaginative touch that makes great science (try his Lizard memoir). Bailey was utterly dedicated to geology, which was excellent for geology but not so good for those who worked under him. When he was professor at Glasgow and was giving an evening lecture to the Glasgow Geological Society, he noticed after several hours that only his dependent staff were still there except for one stranger at the back of the room; stopping his lecture for a moment he addressed the stranger with the hope that he didn't mind the lecture going on so long. 'Oh no', came the reply, 'I'm the night watchman.' At the Survey, Bailey so alienated his senior staff that several refused to attend his farewell dinner. It is part of Wilson's skill that his history is peppered with similar intimate details without just being a succession of good stories.

This book is a 'must' for all interested in the history of geology in its social context.

J. M. HANCOCK

Bell, B. R. and Harris, J. W. *An Excursion Guide to the Geology of the Isle of Skye.* Glasgow (Geological Society of Glasgow), 1986. 317 pp., 36 maps. Price soft-back £5·00 + 65p postage.

The guide is divided into three parts. The first gives a general account of the geology, the second describes the excursions, and the third consists of glossaries and a bibliography. Although the format is compact, an impressive amount of information is included so that the work will unquestionably be useful to those planning and taking part in excursions to Skye. Nevertheless, the prospective user should be warned that the balance lies strongly towards Tertiary igneous rocks, and while this will suit the purposes of many, others who wish to take a broader view of the geology of this notable island will find it frustrating. Of the 22 excursions, for example, about 17 can be considered as largely concerned with Tertiary igneous rocks. Within the introductory review, more than 100 pages are devoted to the same topic, and although it can be argued that the balance is a fair reflection of the outcrop area concerned, it perhaps does less than justice to the Lewisian, Torridonian, Cambro-Ordovician, Trias and Jurassic.

The presentation of the excursions is carefully done, with abundant geological maps and eight-figure map references. Some of the maps are difficult to read, but used in conjunction with a topographic sheet they will certainly serve to locate the exposures. The descriptions of individual localities are, however, mainly rather pedestrian, and there is little attempt to focus on areas which are particularly rewarding or exciting for field study. The scientific treatment is too often merely a dead-pan account of what is there, as if the authors had no opinions of their own. One wishes that illustrations of outcrops, or panoramas, or some sort of critical comment could have enlivened the text. All the same, the bibliography is excellent, and the appendix on the pronunciation of Gaelic place-names is more than welcome (hands up who knows how to pronounce Camas Fhionnairigh!). Irritatingly, there is no index, there are no page numbers in the contents list, and there are no running chapter headings. Clearly the second edition should include a guide to the guide.

K. G. Cox

Laforet, C., Monchoux, P., Oudin, E. and Tollon, F. *Ariège: T2. Bassin versant de l'Ariège* (Inventaire