Part III deal mostly with the experimental determination of the Petch relation for various metals and alloys.

The grain size is undoubtedly one of the most important parameters determining the mechanical properties of polycrystalline materials. There is a trend, however, toward considering not only the grain size but also the nature and structure of the grain boundaries as an important factor in the discussion of the properties of polycrystals. This book is certainly a milestone in the emphasis of the important role played by the Petch relation. The first paper in each part is especially instructive and gives insight into the problems involved in polycrystalline materials. It is hoped that new developments in the theory of the mechanical properties of polycrystals will be stimulated by this book.

H. KIMURA

The Research Institute for Iron, Steel and other Metals
Tohoku University
Sendai
Japan

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The structure of non-crystalline materials, 1982. Edited by P. H. GASKELL, J. M. PARKER and E. A. DAVIS. Pp. xiii+609. London: Taylor & Francis, 1983. Price £28.00, US $62.00.

This substantial and well-produced volume deals with the short-range structure found in vitreous materials or glasses. It consists of the proceedings of the 2nd International conference on this subject, held in Cambridge, England, in July 1982. Sponsored by the Society of Glass Technology, this book contains about 50 papers, by about 75 authors. The first 15 of these approximately 10-page articles describe the various means of determination of local order: EXAFS especially, but also XPS, Mössbauer spectroscopy, X-ray and neutron diffraction, computer simulation, and other methods. Most of the remaining articles deal with particular varieties of material: chalcogenides, oxides, and metals, while a number of papers refer more specifically to the physics of phonons, and of defects in glassy materials.

One rather charming historical point, of interest to crystallographers, was noted in the preface, *viz* that this second international conference on non-crystalline materials took place almost precisely (to the month) on the 50th anniversary of W. H. Zachariasen's classic paper on the atomic arrangement in glass. That paper (in *J. Am. Chem. Soc.* in 1932) opened with the disarming remark, 'It must be frankly admitted that we know practically nothing about the atomic arrangement in glasses'. In fact, Zachariasen's paper marked the beginning of the modern era in this field. Now, 50 years later, it is remarkable, instead, how *much* is known, and what an array of sophisticated technologies is available for the perfecting of that knowledge.

Nevertheless, it would appear that progress has reached a plateau. In their preface, the editors also make the point that, over the past half-decade, since their first international conference on non-crystalline materials, no radically new techniques have emerged, but existing methods are being refined, and are now close to their ultimate limits.

J. H. ROBERTSON

School of Chemistry
The University of Leeds
Leeds LS29JT
England

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Surface studies with lasers. Edited by F. R. AUSSENEGG, A. LEITNER and M. E. LIPPITSCH. Pp. ix+241. Berlin: Springer, 1983. Price DM 62.00, US $26.00.

This book is the Proceedings of an international conference held in Austria in March 1983. It represents an interesting and wide combination of many fields. After a fairly general introductory section on *Surface Spectroscopy*, there are three sections dealing with *Surface-enhanced effects* (principally Raman scattering), *Laser surface spectroscopy* and *Laser-induced surface processes.*

The current state-of-the-art in surface-enhanced electromagnetic effects is well represented in this volume, as indeed are some aspects of spectroscopy. However, this is very much a compilation of contributions to these fields and there is strong evidence that authors were encouraged to be brief with their presentation and consequently the reader is forced to consult the references cited in the papers for any deep understanding.

It is probably safe to predict that the study of laser-induced surface processes will expand significantly in the next few years. The section in this book deals with several aspects applied to semiconductor physics and technology, catalysis, electrolyte–electrode interfaces and metals. Generally, the book serves as a good introduction to the field for surface scientists or laser physicists. However, as most of the material here has already appeared in print in journals one is forced to question the *raison d'être* for this volume. The inclusion of a few more critical reviews may have helped, but nevertheless for anyone interested in the combination of lasers/surfaces this book is quite good value for money, but is likely to have a very short useful life!

P. J. DOBSON

Physics Department
Imperial College
London SW7 2BZ
England