für jedes Kristallsystem. Ähnliches gilt für die Darstellung der dreidimensionalen Gittertypen und die Ableitung der 230 Raumgruppen.

Das Thema Wechselwirkung von Röntgenstrahlung mit kristalliner Materie umfasst die Kapitel 8 bis 10. Die wesentlichen Grundlagen der Röntgenbeugung werden kurz dargestellt. Nachweismethoden und Anwendungen werden genannt. Die Pulvermethoden werden in gedrängter Darstellung behandelt. Kurz wird die Textur gestreift. Bedenken hat der Rezensent gegen den Entschluss des Verfassers, das reziproke Gitter nicht zu behandeln. Wir glauben, jede moderne Einführung in die Röntgenbeugung und Kristallographie, die für Hochschulabsolventen gedacht ist, sollte eine Darstellung der Konzeption des reziproken Gitters enthalten.

Wertvoll sind die letzten beiden Kapitel *Symmetry relationships in physical properties* und *Imperfections in real crystals*. Sie geben einen Überblick über die Nützlichkeit und die Anwendung der Kenntnisse kristallographischer Grundlagen auf praktische Probleme.

Allen Kapiteln sind geschickt ausgewählte Übungen sowie weiterführende Literaturhinweise angefügt. Am Ende des Buches sind die Lösungen zu den Aufgaben zu finden. Das Buch liest sich leicht, teils interessant. Die einleitend genannte Konzeption des Verfassers erscheint – bis auf das Weglassen des reziproken Gitters – im wesentlichen erfüllt.

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Point defects in solids. Vol. 1. General & ionic crystals. Edited by J. H. CRAWFORD JR and L. M. SLIFKIN. Pp.xv + 556, Figs. 169, Tables 77. New York: Plenum Press, 1972. Price $43.00.

The first of three volumes from Plenum Press on *Point defects in solids* concentrates on the general thermodynamics of point defects, on ion-transport phenomena, colour centres and electron transport in ionic crystals. Each of the eight chapters is written by a different author or pair of authors; there is some inconsistency in the levels of the individual articles which vary from gentle introductions to intensive reviews supported by vast bibliographies including some 1972 references. Much of the material has been recently reviewed elsewhere, but some of the contributions give particularly clear accounts of their respective fields. *The statistical mechanics of point defects in crystals* by A. D. Franklin, *Colour centres in simple oxides* by A. E. Hughes and B. Henderson, and *Conduction by polarons in ionic crystals* by F. C. Brown are especially to be recommended. Defects in semiconductors and metals will come under scrutiny in the remaining volumes.

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Quantum electronics in lasers and masers. Vol. 52, Part 2. Edited by D.V. SKOBEL'TSYN. Pp.v + 306, Figs. 109, Tables 36. New York: Plenum Press, 1972. Price $43.00.

This forms number 52 in the Lebedev Physics Institute Series, the translated version appearing in 1972. We have learned to expect from this series comprehensive and authoritative accounts of a wide range of topics in physics and this volume continues to uphold the impressive standards set by earlier volumes. The unfortunate aspect, for a subject which is developing as rapidly as that dealt with, is the long delay between the preparation of the articles and the appearance of the English translation. Thus the latest references quoted in the four articles are for 1967; in many areas of the subjects described, the past five years have seen highly significant developments.

The injection laser has often had the image of being less exciting than the more spectacular gas and doped-crystal devices – a kind of poor relation. It is true that at an early stage in its development problems arose which made for difficulties in obtaining 'tidy' operation of the device. Behaviour was often erratic and unstable and the difficulties of exercising sufficient control over the fabrication led to variations in behaviour which were difficult to understand.

Eliseev's paper deals extremely thoroughly with injection lasers of compounds of the A^3B^5 types and gives an excellent summary of the extent to which these systems can now be understood. In general, the main features of these devices can be understood in terms of the predictions of the band theory of heavily-doped semiconductors. Incomplete understanding of the statistics appropriate to band-filling and of the transition probabilities involved prevents a detailed picture from emerging and the lack of reproducibility from specimen to specimen continues to create problems. Nevertheless, sufficient progress has been made to enable the major factors governing the operation of injection lasers of this type to be identified.

The sport of blasting holes in solids by the use of focused laser pulses has been enthusiastically followed for the last decade or so. This was one of the major technological contributions of the laser which have frequently been described but have not in fact developed to any significant extent. The complexity of the processes recurring, often under conditions for which little information existed, led to problems of interpreting the observations made. Afanas'ev and Krokhin describe their gas-dynamical approach to the problem of predicting the correct analytical dependence of the parameters of the vaporized substance on the radiation flux density, time and material characteristics. The results, as the translator puts it, 'enable one to explicate the principal physical attributes of the process'.

Of closely related interest is the hope that by the use of sufficiently intense laser pulses, temperatures sufficiently high for thermonuclear reactions to occur could be produced. Basov's group were among the earliest to form the 'neutron club', formed of those who have observed emitted neutrons from focused high-energy laser pulses. The paper by Basov, Krokhin and Slizkov gives an excellent summary of the experimental work up to 1967 on the study of laser-produced plasmas. At that time, the maximum temperatures observed were around 60 eV – too low to be of interest for the thermonuclear problem.

Among the earliest observations on the ruby laser, the now-familiar 'spiking' phenomenon was apparent. At a