

magnetic interactions with the atoms of a crystal but also to 'set out all contemporary ideas' on the subject of magnetism in crystals.

In line with this aim, the first two chapters, each of about a hundred pages, are entitled *Modern Views on Atomic Magnetic Ordering* and *Theory of the Scattering of Slow Neutrons in Magnetic Crystals* and reflect the approach of the first-named author who is a theoretical physicist at the Institute of Metal Physics in Sverdlovsk. The succeeding 150 pages are predominantly the work of Dr Ozerov, a practising neutron crystallographer of the Karpov Institute in Moscow, and relate to methods of magnetic structure determination and a review of some results. Two observations seem to be important here. First, although the third chapter does set out 'to describe experimental methods' it is only the final few pages which do exactly this and the chapter is mainly concerned with the more abstract problem of interpreting the experimental data, including the use of symmetry representation, and correlated with an appendix which analyses the systematic extinctions which are associated with all possible elements of symmetry and anti-symmetry. This work draws on the conclusions of a section in the opening chapter which gives a very welcome account of the teaching of Koptsik on the Shubnikov groups. Secondly, the chapter which reviews results makes no attempt to be encyclopaedic – a course which has long been outdated by the mass of material available – but concentrates on two classes of material. These are the rare-earth metals and their compounds and the double oxides of various metals, the choice being substantially dictated by the desire of indicating the complexity and novelty of the types of magnetic structure which have been revealed.

The remaining three chapters are aimed more at the specialist practitioner. Chapter V, which is entitled *The Distribution of Magnetic Moment in Crystals*, gives a very valuable account of magnetic form factors, making the most of what is still a rather limited amount of data on this subject, and a review of the Low-Collins technique of studying the spatial spread of magnetic moments in dilute alloys. Chapter VI is devoted to the *Dynamics of the Magnetic Lattice* and deals particularly with experimental methods of examining spin wave scattering and the critical scattering associated with magnetic transitions. Finally comes a chapter devoted to a theoretical discussion of the spin wave excitation in ferromagnetic crystals which contain impurities. This chapter was written after the appearance of the Russian edition of the book and concludes with a short account of the first experimental information, in 1967, on this topic.

The formal chapters are succeeded by the symmetry-extinction data to which we have already referred, diagrams of the 36 Bravais lattices which take into account black-and-white magnetic symmetry, an index of substances whose magnetic structures are discussed, a general index of topics and a list of references to the literature. It seems, almost ungrateful to suggest that the value of the book as

a work of reference would be enhanced if the list of references, which are simply numbered in order of occurrence in the book, was supplemented by a list in which the authors' names appear alphabetically.

The book is a welcome addition to the literature and highly recommended both as a text and as a work of reference.

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**Crystal defects and crystalline interfaces.** By W. BOLLMANN. Pp. xi + 254. Berlin: Springer Verlag, 1970. Price (cloth cover) DM 98, \$ 27.00.

In recent years considerable progress has been made in understanding the nature of high-angle grain boundaries. Whereas the models for low-angle grain boundaries based on arrays of discrete dislocations seem to be well established this is not the case for the models of boundaries with angles of misorientation exceeding such a value that the dislocation cores start to overlap. Recently models based on the concept of the coincidence lattice have been quite successful in explaining many features of high-angle grain boundaries. It is this subject, to which Bollmann has contributed significantly himself, which constitutes the central theme of the book.

The book contains a somewhat unexpected combination of material. The introductory chapters, which occupy roughly half of the book, are quite elementary; they give a very condensed survey of lattice defects mainly from the geometrical point of view. The reasoning is usually qualitative only and very few derivations are given.

The rest of the book is devoted to the subject to which the author himself has contributed, *i.e.* the geometrical theory of crystalline interfaces. In this part the derivations are given in detail; extensive use is made of matrix methods.

The book gives a somewhat unbalanced impression; whereas the material which is taken from the author's papers is treated in detail, the rest of the book is apparently only intended to put the author's own work in the proper framework and therefore treated superficially.

It is not quite clear for which audience the book is intended, but all those interested in solid-solid interfaces should benefit from reading this book, which is well written and well presented.

The reader is greatly aided in understanding some of the derivations by the use of transparencies of two-dimensional lattices, which are provided with the book.

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