

authors have appeared fairly regularly over the years, but the field is growing fast and this new report certainly fills a need.

As the names of the authors would make one expect, the emphasis is on the application to structure determination. Well over half the article is taken up by the fundamentals (including an up-to-date table of nuclear scattering powers). Apparatus and techniques are described only very briefly. The rest of the article is a summary of the structure determinations that have been done up to now.

The unwary reader might have been saved some confusion by a clear warning against the unfortunate circumstance that the word 'polarization', when used with reference to neutron beams, has a meaning quite different from that which the X-ray crystallographer is likely to attach to it. Now he will learn on p. 6 that the intensity formulae for neutron scattering contain no factor corresponding to the 'polarization factor', yet on p. 17 there is reference to a 'polarized' neutron beam. In other respects, anyone who wishes to become acquainted with the field will find this an excellent introduction, while the X-ray crystallographer who is not in the first place interested in neutron diffraction for its own sake may find it refreshing to see how such concepts as incoherence and secondary extinction, which, in his domain, are often purely academic, here assume an entirely different order of importance.

The next four articles are to a varying degree concerned with the field of solid-state physics:

*Physical Properties and Atomic Arrangement in Crystals* by W. A. WOOSTER (21 pages). The author has wanted to avoid the somewhat beaten path of the alkali halides, and has selected four properties on which much work has been done lately, these being the magnetic, optical, piezoelectric and elastic properties. Inevitably there is some overlap with the preceding article (MnO and the ferrites). There are some inaccuracies: the terms 'fourfold' and 'sixfold' are used to denote the different positions in the spinel structure, and a reference to Slater's paper has been omitted from the discussion of the  $\text{KH}_2\text{PO}_4$  transition.

*Raman Effect in Solids* by A. C. MENZIES (25 pages). Here the emphasis is on the alkali halides. Raman's lattice dynamics are discussed briefly.

*Paramagnetic Resonance* by B. BLEANEY & K. W. H. STEVENS (42 pages).

*Semiconductor Circuit Elements* by J. S. BLAKEMORE, A. E. DE BARR & J. B. GUNN (56 pages).

The remaining articles are:

*Electrical Discharges* by F. LLEWELLYN JONES (50 pages).

*Fluctuation Theory in Physical Measurements* by C. W. McCOMBIE (55 pages).

*Cosmology* by W. H. McCREA (43 pages).

*The New Unstable Cosmic-Ray Particles* by G. D. ROCHESTER & C. C. BUTLER (43 pages).

Of these, the second deals with a problem that is of importance in almost any kind of experimental work, and the third will not fail to fascinate its readers.

J. A. GOEDKOOP

*Joint Establishment for Nuclear Energy Research*  
Kjeller, Lilleström, Norway

**Introduction to Solid State Physics.** By CHARLES KITTEL. Pp. xiii + 396 with many figs. New York: Wiley; London: Chapman and Hall. 1953. Price \$7; 56s.

This is a most welcome book. One difficulty about solid-state physics is that there is much doubt in the minds of senior students of physics and others as to what solid-state physics means. For example, one frequently encounters students who appear to believe that ferromagnetism is not included under this heading; such students will find much enlightenment in this book. Another difficulty is that there is a wealth of valuable, specialized monographs and treatises on many aspects of the solid state, but, unfortunately, they nearly all require mathematical knowledge which is not possessed by the average intelligent student, who needs above all that emphasis shall be placed on the basic physical principles involved.

Now, Charles Kittel is well known as a research worker of considerable vision and a writer of great clarity, and his book is exactly what one would expect from him. The contents are admirably collated, and the several sections are all lucidly treated. If one may single out particular sections for special praise, one may mention the chapter on dielectric constants with its admirable statement of dielectric field concepts; the chapter on ferroelectric crystals with its discussion of dielectric phenomena near the Curie point; the chapter on ferromagnetism and antiferromagnetism with its very neat treatment of gyromagnetic difficulties; and the chapters on the band theory of metals, on semiconductors and imperfections in solids, all containing notable contributions.

In every case the basic physical principles are carefully set forth and, where necessary, important mathematical proofs are relegated to an Appendix. The whole work is properly illustrated and supplied with many tables of physical constants. Indeed, one could learn quite a lot merely by studying the illustrations with their clear and helpful legends. Apart from a few obvious misprints, easily corrected in a future edition, the book is excellently produced. It is unreservedly recommended.

L. F. BATES

*Department of Physics*  
*The University*  
*Nottingham, England*