War I there was no opportunity to continue research work. Instead WHB was contributing efficiently to the fight against submarines; he invented new acoustic hydrophone detectors and laid the foundations of the ASDIC ('Anti-Submarine Division-ics') techniques, initiated by Langevin in France.

When peacetime returned, WHB was named President of the Royal Institution and brought it back from the decline in which he found it to its present fame: 'RI has produced more fundamental breakthroughs per square foot than any other establishment in the world'.* Eight Nobel laureates have been professors there. With the years, the crystallographer WHB became a 'national figure representing science'. President of the Royal Society from 1935, he had firm views on all aspects of science and education and when World War II came he expressed his views in strong words: 'the authoritarian state tends to decision without enquiry; the democracy tends to enquiry without decision' and Winston Churchill accepted his idea of the SAC (Science Advisory Committee to the government during wartime).

The book fairly reflects the quasi-religious sense of responsibility of WHB proven throughout his whole life. 'He is a great man of science and he is also a very great man.'†

The only criticism addressed by this reviewer to the lucidly written and well documented book on WHB, which G. M. Caroe dedicated to the memory of her brother WLB, is that while the reader is quite happy to see pictures of WHB, of his wife and also of WLB, there are no pictures of the author's other brother, Robert Charles, killed during World War I at Gallipoli (1915) . . . or herself. But this might be the reaction of a French temperament.

E. F. BERTAUT

Laboratoire de Cristallographie
CNRS Grenoble
25 avenue des Martyrs
38042 *Grenoble CEDEX*
France

* Sir George Porter, present director.

† Rutherford in a discussion with the anatomist Arthur Keith about who should become President of the Royal Institution.

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An introduction to microscopy by means of light, electrons, X-rays or ultrasound. By T. H. ROCHOW and E. G. ROCHOW. Pp. xvi + 367. New York: Plenum Press, 1978. Price £18·58.

This book offers an introductory account of the various techniques of microscopy of materials. It is completely qualitative in approach and is clearly illustrated with ray diagrams, block diagrams and photographic examples of each of the techniques discussed.

The opening chapters define the various types of microscopy and their characteristics, dealing in turn with the various types of optical microscopy, *e.g.* using transmitted and reflected light, including polarized light. Brief descriptions are given of photomicrography, as well as phase contrast and interferometric techniques.

Later chapters discuss transmission and scanning electron microscopy, again in a wholly descriptive manner, and the book concludes with an outline of field-emission, X-ray and acoustic microscopy.

The book will certainly give a layman an insight into the wide range of microscopical techniques available, although it may be argued that it is of little value to the more serious student. The latter category of reader would require a more critical and up-to-date reference list for further reading than that provided by the authors; this is particularly true for topics such as electron microscopy and field-ion microscopy, where guidance to modern quantitative discussion of the application of these techniques is of paramount importance.

J. W. MARTIN

Department of Metallurgy and Science of Materials
University of Oxford
Parks Road
*Oxford OX*1 3*PH*
England

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Introduction to solid state theory. By O. MADELUNG, translated from the German by B. C. TAYLOR. **Springer series in solid state sciences. Vol. 2.** Pp. xi + 486. Berlin, Heidelberg, New York: Springer, 1978. Price: DM 59·00, *ca* US $29.50.

Solid-state science is an enormously broad field, which seems to be growing continuously both in width and depth. Despite the fairly large number of books published in recent years, not least about its theoretical side, there is definitely room for more presentations of the subject, particularly if the perspective is a little unusual.

That is one characteristic of this book by Madelung, which is a revised and partly rewritten translation of three pocket books published in 1972 and 1973 in German. Its strength is the concentration on essential concepts and their relationships. Since, on the other hand, the author's intention was not to write an encyclopedia, a number of topics ordinarily found in other solid-state books had to be left out.

The basic chapters on the one-electron approximation and on elementary excitations fill more than a third of the book. The concept of the quasi-particle is central to the development. In the next four chapters interactions between various kinds of quasi-particles are discussed with reference to those properties of solids which they 'explain': electron–phonon interaction and electrical conductivity, electron–electron interaction and superconductivity, electron–phonon and phonon–phonon interactions and optical properties, and, finally, phonon–phonon interaction and thermal properties.

Part of a chapter is devoted to a field which, strangely enough, receives very little attention in most text-books on solid-state physics, namely, chemical bonding and cohesion in solids. Here there is definitely more than the mere classification into ionic, covalent, metallic and molecular solids. In particular, the discussion on the conceptual difficulties one encounters in this connection is very welcome. On the other hand, it is a bit disappointing to see that the author seems to be completely unaware of the con-