

Theory of Crystal Dislocations

By Prof. A. H. Cottrell. (Documents on Modern Physics.) Pp. ix + 94. (London and Glasgow: Blackie and Son, Ltd., 1964.) 32s. 6d.

THIS little book (also available in paper-back form) is a kind of vade-mecum for dislocationists. It deals with the basic theory of dislocations, and consists mainly of the notes prepared for Prof. Cottrell's lectures to the 1956 summer school of the University of Grenoble at Les Houches. Some measure of the extent to which this theory has now been incorporated into the accepted physical scheme is provided by the fact that only minor changes were necessary when the manuscript was prepared for publication six years later.

It is perhaps unnecessary to add that this rather satisfactory situation does not extend to the complex many-dislocation problems which are encountered in plastic deformation. Developments in the theory of deformation, and in the experimental observation of dislocations by high-resolution techniques, are mentioned briefly in a series of very short notes added to the original manuscript. Although these additions were completed as recently as 1962, they have inevitably dated much more rapidly than the basic theory; the 'jog theory' of work-hardening, for example, is no longer current.

The book is written with Prof. Cottrell's usual clarity, but it should be emphasized that it is not a text-book from which to approach the basic theory for the first time. Its main use will undoubtedly be as a desk-book for quick ready reference, or as a companion of such slender dimensions as not to deter the aeroplane traveller. It is a great convenience to have so many useful results gathered together in compact form, and it may seem ungrateful to ask for more. However, there have been important developments in basic theory in the past few years, dealing, for example, with the stress fields of various types of dislocation aggregates, or with the theory of continuous distributions of dislocations. If Prof. Cottrell could find time to add these to a future edition, the value of the book would be even greater.

J. W. CHRISTIAN

Molecular Orbital Theory

By C. J. Ballhausen and Dr. Harry B. Gray. (Frontiers in Chemistry.) Pp. ix + 273. (New York and Amsterdam: W. A. Benjamin, Inc., 1964.) 9.90 dollars.

THIS book is divided into two approximately equal parts, the first being a text of atomic orbitals using the LCAO approach, while the second part is a collection of previously published papers on the subject. A very simple and short exposition is given of the basic concepts of the LCAO theory, which leads into a group theoretical section on the uses to which these simple concepts may be put. These include symmetry consideration electronic states and hybridization. The types of possible bonding systems are discussed and the results applied to selected diatomic, triatomic and a few of the more simple polyatomic molecules. Finally, the theories developed are applied to more complicated polyatomic molecules making use of ligand field theory. The book is written in a simple manner with the result that the reader is sometimes left with the impression that the stage of knowledge of molecular theory is more advanced than is the case in reality. The illustrations are not only well done but are also so positioned in the text that they are extremely useful to those readers who are not very conversant with the more mathematical form of presentation. The choice of papers in the second part is in some cases a little surprising, but some very useful information has been collected together, making the book valuable as a reference for the reader interested in making molecular calculations.

E. W. T. RICHARDS

The Evolution of the Bristol Channel

By F. J. North. Third edition, revised and enlarged. Pp. vii + 110 + 14 plates. (Cardiff: National Museum of Wales, 1964.) 15s.

OVER a period of many years Dr. North has done much to interest the layman in geology, particularly in South Wales. In the third edition of *The Evolution of the Bristol Channel* one of his books is once more brought up to date, incorporating much recent work in this area. A historical introduction precedes a simple account of the geological processes of erosion, transport and sedimentation, and earth movements; and this is followed by a concise geological history of the region, with particular reference to the Welsh coast. Useful palaeogeographical maps and a geological time scale (the latter unfortunately not brought up to date) accompany accounts of the structure of the Welsh coalfield and of the geological reasons for the distribution of the mines. Similarly a description is given of how the formations exposed on the coast of South Wales control the form of the coast-line. The origin of the South Wales drainage pattern, the evolution of the Bristol Channel since its appearance in Pliocene times, the Recent changes in sea-level, the appearance of man, the accretion of sand dunes, and the great flood of the Wentloog Level in 1607 are among the many topics dealt with in an interesting manner. The plates and diagrams usefully supplement the text, though the standard of reproduction is not high. Visitors to the South Wales coast and the local inhabitants are fortunate in having available this very readable account of the local geological history.

A. R. MACGREGOR

Tizard

By Ronald W. Clark. Pp. xvii + 458 + 16 plates. (London: Methuen and Co., Ltd., 1965.) 50s. net.

SIR HENRY TIZARD is still freshly remembered by many who worked with him or were associated with him in one or more of his varied activities. In the relatively short time since his death numerous tributes have been paid to his work, notably by Prof. P. M. S. Blackett and by Prof. R. V. Jones in Tizard Memorial Lectures, in Sir Harold Hartley's memoir for the Chemical Society, and by Sir W. S. Farren and Prof. R. V. Jones for the Royal Society. Nevertheless, there is a place for Mr. R. W. Clark's book, in which he has made full use of his access to unusually large collections of papers.

With one reservation, Mr. Clark has given us a well-balanced account of Tizard's life and work which does full justice to Tizard's real achievements. The reservation relates to the chapter on Tizard's post-war years as chairman of the Advisory Council on Scientific Policy and of the Defence Research Policy Committee, which scarcely conveys the significance of his positive achievements or the magnitude of his own contribution to the complex problems of the relations between science and Government. Mr. Clark, moreover, has avoided being drawn into personalities of the argument that has stemmed from Sir C. P. (now Lord) Snow's lecture on that theme, and his book points to most of Sir Henry's activities in the field of education. Its value is enhanced by a careful bibliography and references to most of Sir Henry's published papers. There is an error on p. 369, when a long letter to Sir Alan Barlow is attributed to Sir Henry himself instead of Sir Thomas Morton—an error which has since been rectified by Mr. Clark, who notes that the views expressed in it are substantially those of Sir Henry himself.

If the book is one to be studied by all who are concerned with the intricate problems of science and Government, it can scarcely be put down by a British reader without some sense of shame for the way in which Sir Henry was treated by the British Government. The exploitation of the scientific adviser moving in and out of the Civil Service is a reproach which we should be at pains to avoid in any structure established for civil science.