

ments in the fields. Catterall shows that, although really important advances in techniques for investigating electronic structures have been made recently, the results are still far from definitive. In contrast, Nutting indicates how results achieved by improved techniques of electron transmission microscopy have confirmed to a remarkable degree earlier predictions of the dislocation theory.

All of the papers are written lucidly and at quite an elementary level. They should serve quite well the purpose for which they are intended.

The Atom and the Energy Revolution. By Norman Lansdell. 200 pp. Philosophical Library, Inc., New York, 1958. \$6.00. *Reviewed by Norwood Russell Hanson, Indiana University.*

MR. Lansdell's book is a fact-studded description—well lubricated with graphs, statistics, and photographs—of how the increasing availability of atomic energy is affecting the energy resources of the world as a whole. The strictly conceptual content of Mr. Lansdell's work, therefore, is subordinate to setting straight the factual record about the impact of this new energy discovery on the respective capacities of nations in the world-wide struggle for economic and social survival.

The first portion describes the demands being made on the world's orthodox energy resources. How the major, and minor, countries compare with each other in this connection is clearly delineated. Next, Lansdell analyzes the several types of power: wind power, water power, vegetable resources, solar energy, electrochemical generation of electricity, direct conversion of radiation into electrical current, and finally atomic energy. A popular, and (to the specialist) mildly inadequate, survey of the history and theory of atomic energy release is set forth. None of this is new, but its utilization for Lansdell's objectives is effective and interesting. The same observations apply to the author's accounts of the resources available for atomic energy development and of the actual and potential applications of nuclear technology.

Now Lansdell settles down to his major objectives. What practical, experimental, and theoretical moves are being made within our world for the understanding and exploitation of this new force in human affairs? He tells us in admirable detail. The section on the political and commercial organizations for atomic energy development will apprise many readers of facts they cannot have assessed before. The international organizations concerned with this development—EURATOM, CERN, IAEA—are described with refreshing plausibility. Most of us will never have an opportunity to read the mountains of words written about such agencies, and Lansdell's summation is extremely valuable.

The volume concludes by discussing the world impact of atomic energy. Such subjects as the influence of atomic energy development on other industrial techniques and its influence on the balance of world trade are surveyed with the author's uniform capacity for amassing stores of factual material and presenting their

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essence to the nonspecialized reader with clarity and honesty. For a large class of readers Lansdell's book can be recommended as a gold mine of information about the sociological and political periphery of the greatest technological advance of all times.

The Determination of Molecular Structure. By P. J. Wheatley. 263 pp. Oxford U. Press, New York, 1959. \$5.60. *Reviewed by R. A. Pasternak, Stanford Research Institute.*

THE explosive growth of scientific knowledge has forced the scientist or engineer to become a specialist to an ever-increasing degree. The universal chemist of only a century ago has become, for example, a physical chemist who further specializes in structural chemistry and finally turns into an infrared spectroscopist. The complexity of modern research and technology makes it mandatory, however, that the specialist have a good grasp of the power of other techniques and approaches in order to correlate and coordinate his research with that of others.

In *The Determination of Molecular Structure*, P. J. Wheatley attempts to fill the great need for scientific education in an area of paramount importance for the physical and biological world. The author has the ambitious aim to give "an introductory survey of the main physical-chemical methods that have been devised for the determination of molecular structure" and he succeeds admirably in this undertaking. The major methods of structure determination are presented in a logical and easily understandable form. A valuable discussion of their limitations and accuracies is included. This wealth of information is contained in only 260 pages, and is achieved by emphasizing the physical process underlying the methods, making use of well-designed illustrations, and largely omitting the derivation of the mathematical expressions.

In order to keep his treatise short, which is one of its principal merits, the author had to exercise great restraint in selecting material. One omission is perhaps especially surprising: electron paramagnetic resonance is not presented, although a full chapter is devoted to magnetic methods. As for omitted details, in the discussion of x-ray crystallography, the reviewer's field of specialization, no reference is made to least-squares methods for refining atomic parameters, although this technique is being used extensively. Thus, it is likely that other omissions will be discovered by some indignant specialists in other chapters of the book.

Wheatley's style is simple and precise. The subdivision of the chapters into titled and numbered sections enhances the readability. Although the drawings are informative and well done, reproductions of actual spectra are as a whole poor and should be improved in a future edition.

Wheatley's *Molecular Structure* is recommended highly to the chemist or physicist who is interested in the structure of molecules whether he is still in college or is professionally active.