

reversal in crystallography and its relation to the so called magnetic groups. The symmetries of property tensors up to rank four are fully and explicitly discussed. The reviewer was particularly attracted by the application of the general theory to such phenomena as piezomagnetism, pyromagnetism and the magnetoelectric effects. The experimental evidence for these phenomena, which are 'forbidden' within the framework of the classical (*i.e.* non-magnetic) point groups, is reviewed.

The article by W. Cochran on lattice vibrations emphasizes theoretical and experimental studies on specific classes of crystals, *e.g.* covalent crystals, ionic crystals, molecular crystals, and metals. The limitations of the classical Born theory and recent developments (shell model for ionic crystals, non-adiabatic effects in metals) are discussed in some detail against the background of the experimental evidence from X-ray and neutron scattering.

E. Menzel contributes a short article on the preparation and the study of nearly perfect metal surfaces. Its main emphasis is on experimental techniques.

A detailed article by A. C. T. North is devoted to the X-ray crystallography of large molecules of biological importance. A survey of the methods that have been developed in order to solve the phase problem for large molecules and complex structures is followed by a description of the most important examples of structure determinations in biological materials, including nucleic acids, fibrous and globular proteins and some of the viruses. The article is written in a style that will also attract non-specialists.

Finally we mention three contributions of interest to solid-state physicists, namely those on the generation of high magnetic fields (D. B. Montgomery), on the theory of irreversible processes (G. V. Chester) and on the electronic properties of liquid metals (N. E. Cusack). The last mentioned article is particularly recommended as a presentation of this rapidly developing field that is well balanced between experiment and theory.

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**Clays and clay minerals.** Proceedings of the Eleventh National Conference on Clays and Clay Minerals. Edited by W. F. BRADLEY. Pp. ix+368. New York: Pergamon Press, 1963. Price £5.5.0.

The eleventh annual conference on Clays and Clay Minerals was held in Ottawa, Ontario, on 13-17 August 1962, and this book contains the published proceedings. The main part of the conference was devoted to a symposium on Clay Mineral Transformations at which eighteen papers were presented; sixteen of these are published here in full and abstracts are given of the two others. Almost all the papers are concerned with the mineralogical aspects of weathering. The widespread use of X-ray pow-

der diffraction for identification of fine-grained materials is shown by its use in eleven of the sixteen full papers presented in the symposium. The general session contains thirteen papers of which four appear in abstract only. This session covers a wide range of clay-mineralogical topics ranging from a summary of recent work on the cell dimensions of layer-lattice silicates to a paper on clay mineralogy in building research.

The book, as is usual with this annual publication, is well-produced and has a good nine-page index. The editor and the publishers are to be congratulated on reducing the time-lag between conference and publication from nearly two years for the 1960 conference to fifteen months for the 1962 conference. The papers presented at these conferences are of interest to all working on clays and rapid publication greatly enhances the value of the published proceedings.

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**Structure reports for 1953. Volume 17.** General Editor, W. B. PEARSON and Section Editors W. B. PEARSON (Metals), J. WYART (Inorganic Compounds) and J. MONTEATH ROBERTSON (Organic Compounds). Pp. viii+863. Published for the International Union of Crystallography. Utrecht: N. V. A. Oosthoek's Uitgevers Mij, 1963. Price 125 Netherlands Guilders; \$35: £12.10s.

The volume of *Structure Reports* under review contains the relevant information of crystallographic work published in 1953. Like its predecessors it contains detailed and factual information, concisely presented, of use not only to the specialist but also to those in other disciplines. Nothing that is particularly significant appears to have emerged in 1953 apart from the outstanding contribution towards our understanding the structure of deoxyribonucleic acid, DNA.

These volumes are now under the General Editorship of Dr W. B. Pearson who has, as usual, been assisted by teams of able abstractors. Structures have not been listed according to structure type, as was the case in the original *Strukturbericht*, but in each section in order of increasing complexity. This change has been inevitable in view of the complex types now being revealed in all fields. Naturally this had led to a certain simplicity of approach in the presentation of structures and in the manner of their indexing. As more of these volumes appear and the time gap is narrowed in bringing out back numbers to complete the series it seems inevitable that difficulties will be experienced in tracing, for instance, families of structures through *Structure Reports*. It will accordingly be very difficult to see in this monumental collection anything but the details that interest the seeker. What is going to be needed therefore is a more comprehensive