

death in 1902, the politicians had their way and the scientist was ignored. A few weeks before his death Powell saw the signing by Theodore Roosevelt of the decree setting up the Reclamation Bureau but, sixty years later, the folly of ignoring Powell's Report is still apparent. There is, in fact, a great deal in the Report with lessons for the present day.

L. DUDLEY STAMP

Progress in Dielectrics

Vol. 4. Edited by Dr. J. B. Birks and Prof. J. Hart. Pp. vii + 311 + 13 plates. (London: Heywood and Co., Ltd., 1962.) 63s. net.

THE fourth volume of this series contains six articles which fall into four groups. The first two articles concern microwave properties. The first one, by Sheridan, is a useful review of the "Microwave Spectroscopy of Gases" written largely from the point of view of the chemist interested in molecular energy-levels. The second, by Illinger, on "Dispersion and Absorption of Microwaves in Gases and Liquids", is rather too long for a survey of recent work, while not being fundamental enough to fulfil the functions of a text-book.

The article by Merz on ferroelectricity is lucid and concerned with the most difficult aspects of its subject, in particular switching, domain boundary motions, and space charge and surface effects. Merz also gives a survey of dielectric data at infra-red and microwave frequencies, and of results obtained with magnetic resonance techniques.

The article by Dakin and Berg on the "Theory of Gas Breakdown" gives a lucid survey of a large subject, addressed primarily to the engineer or physicist concerned with practical aspects. Sharbaugh and Watson, writing on "Conduction and Breakdown in Liquid Dielectrics", bring up to date a review by Lewis in the same series in 1957. A fair amount of new experimental information has accumulated since that time. However, the conflict between the rival electronic and cavitation theories is still not resolved.

The article on "Static Electrification I" by Loeb is an authoritative survey of a subject which has progressed relatively little in recent years but is of interest in view of the present interest in surfaces. It contains relatively simple derivations of the electrokinetic potential and allied concepts.

V. DANIEL

Rock Pressure in Mines

By E. de St. Q. Isaacson. Second revised and enlarged edition. Pp. x + 260. (London: Mining Publications, Ltd., 1962.) 50s.

THE need for a second edition of E. de St. Q. Isaacson's *Rock Pressure in Mines*, after only four years, is evidence of the wide acceptance of this book as a standard treatise on the subject.

The most important feature of the new edition is the addition of a chapter on stress waves resulting from rock-bursts. The author considers the effects on an excavation of the longitudinal and transverse vibrations set up by a rock-burst, the focus of which is not immediately adjacent to the excavation. In particular, he considers their effect on a tunnel or shaft lined with concrete. While emphasizing that the problem still requires more study, he suggests that careful siting and orientation and the use of wall-bolting can do much to reduce the risk of failure under these vibrations.

Throughout the book the author has extended his consideration of a number of problems. Among the more important of these are the case of an elliptical opening with axes inclined to the principal stress axes, stress distribution around a crack, and the load which can be taken by a pillar. The shaft deformation bar and the horizontal pendulum have been included among the instruments useful for measuring underground stresses.

J. K. L. GRAHAM

Physics of the Nucleus

By M. A. Preston. Pp. x + 661. (Reading, Mass., and London: Addison-Wesley Publishing Company, Inc., 1962.) 113s.

THIS is a text-book of nuclear physics intended to form a suitable basis for post-graduate courses in the subject for students already having a grounding in nuclear physics and quantum mechanics at undergraduate level.

The main topics discussed are fundamental properties of nuclei, nuclear models, electromagnetic properties of nuclei, particle radioactivity and nuclear reactions.

As an account of nuclear physics in a single volume this book is excellent both as to its selection of material, which forms the present main stream of the subject, and its treatment. In the latter the author has succeeded very well in drawing together and showing the underlying unity of topics of historically untidy development such as nuclear models and nuclear reaction theory. In achieving this elegance the historical approach has had to be abandoned together with, to a great extent, the experimental bases on which the account of the nucleus presented here rests, and to this extent the treatment is incomplete. This material can, however, be supplied from other sources. The book must to a great extent be read as a whole and this certainly applies to the main sections. This appears to me to diminish somewhat its value as a work of reference.

Despite these minor reservations, this is a book which can be warmly recommended to all who study, practise or teach nuclear physics.

A. T. G. FERGUSON

Worked Examples in Physics

By V. L. Zubov and V. P. Shal'nov. (Text-book for private study.) Fifth edition. Translated by Erwin Marquit. English Translation Editor: D. L. Evans. Pp. xii + 341. (London and New York: Pergamon Press, 1962.) 35s. net.

THIS is quite a useful collection of problems. There are hints on the solution of questions at the start of each section, and outline solutions also as well as answers at the end. The student using it for its intended purpose, as a text-book for private study, will probably get the best value from it. In terms of absolute value for money, however, it is expensive for a set of questions (compare the Cavendish Problems at 5s. 6d.), costs rather more than a complete range of texts that would cover the work fully, questions and all, and seems to be in the same price group as the American text-books which provide complete courses at this level and are superbly produced.

Unfortunately, it is not made clear to the prospective purchaser exactly what this level is. The short note on the wrapper suggests that it goes beyond what is usually done in secondary schools, and reaches university scholarship level. Then one realizes that this is probably direct translation, that the word 'scholarship' is used in the attributive rather than the competitive sense and that the university is 'Mosegrad' and not 'Oxbridge'. I consider that the standard is somewhere between Ordinary and Advanced Levels in British schools; and that the publishers have, all in good faith, confused equivalence of status with equivalence of standard.

Besides numerical examples, there are a number of good qualitative exercises (particularly on magnetism and electrostatics) and some interesting historical notes. In the Joule-Lenz Law for the heating effect of a current there seems to be a new instance of the Boyle-Marriotte congruence; and as Boris Semenivich Yakobi (inventor of electrotyping, the electric motor, the recording telegraph, and galvanic mines) pioneered resistance standards there are one or two examples in Yakobi units as well as ohms. One excellent feature is the abundance of simple diagrams. There is always room for a new collection of exercises for class use, though for this purpose teachers