SHORT REVIEWS

A Journey Through Space and the Atom

A Course of Selected Lectures in Astronomy, Space Rocketry and Physics. Edited by Prof. S. T. Butler and Prof. H. Messel. Pp. 495. (Sydney: Shakespeare Head Press, Pty., Ltd., 1962.) n.p.

THIS volume records the texts of four sets of lectures given at a Summer Science School at the University of Sydney in January 1962, and intended for "fourth-year High School students". The first contribution, by Prof. H. Bondi, "The Structure of the Universe" (77 pages), is a satisfying introduction to relativity and cosmology; the second is a lively speculative essay on "Life in the Galaxy" by Prof. R. N. Bracewell (12 pages). In the third contribution, of 181 pages, Prof. W. von Braun provides a lavishly illustrated guide to "Space Rocketry", which has particularly valuable sections on electric propulsion and on the U.S. *Saturn* rocket programme. Finally, the editors, Profs. S. T. Butler and H. Messel, contribute 209 pages on "Elementary Atomic Physics and Applications of Atomic Energy", which, according to their preface, constitute a slightly condensed version of a text already published in two previous books of theirs, to which they frequently refer.

Although the individual contributions can confidently be recommended, the book as a whole has many flaws. The sections differ in tone and treatment and are unco-ordinated, so that repetition occurs and obvious cross-references are not made. Some lectures are apparently printed verbatim: "located right there in Huntsville, Alabama" comes well from a lecturer with map and pointer, but reads oddly. Some of the visual aids, too, are unsuitable for a book, for example, the half-page illustration consisting of: (1) the words 'Rocket Propulsion', (2) a diagram of a large key, and (3) the words 'Key to Space'. Other irritations abound: the photographs occupying pages 182, 214 and 279 are identical; there is no index or price; misprints, etc., are unduly numerous. These editorial deficiencies inevitably detract a little from the worth of the book.

D. G. KING-HELE

Advances in Cryogenic Engineering

Vol. 7: Proceedings of the 1961 Cryogenic Engineering Conference, University of Michigan, Ann Arbor, Michigan, August 15–17, 1961. Edited by K. D. Timmerhaus. Pp. x+582. (New York: Plenum Press, Inc., 1962.) 17.50 dollars.

IN the latest volume of *Advances in Cryogenic Engineering* a new store of authoritative information on topics of low-temperature physics and engineering has been released. Almost all the 73 papers given at the conference are printed, together with brief summaries of the discussions. Comparing successive volumes there is evidence of gradually increasing quality. Most of the contributions are from American industrial sources although about 20 come from U.S. Government laboratories. Very few emanate from universities.

Among the four invited papers it is pleasing to note that one describes the work of Sixsmith on miniature turbines which he originated at the University of Reading and later took to the Boulder Laboratory. The other three papers deal with the contribution of cryogenic calorimetry to solid-state chemistry, the U.S. Helium Conservation Programme and, finally, the behaviour of cryogenic liquids in the absence of gravity.

The contribution of cryogenics to the 'space race' is evident in several groups of papers under the headings "Space Simulation", "Equipment" and "Heat Transfer Phenomena". Detailed results and design methods are given relating to most aspects of the storage, pumping, and transfer of liquid oxygen and hydrogen.

There is a significant and welcome increase in the number of papers dealing with low-temperature phase equilibria—including the improbable mixture oxygen/hydrogen. There are also further valuable additions to the published data on the physical properties of metals and non-metals at low temperatures, including adhesives and elastomers. Those who hope to find in the latter paper details of a new wonder material maintaining elasticity at low temperatures will be disillusioned. They will find, however, an exact design method for 'O' ring seals which will probably remain gas-tight on cooling. The volume concludes with a useful cumulative subject index embracing Volumes 6 and 7. G. G. HASELDEN

Fundamentals of Electrical Science

By C. T. Baldwin. Pp. 336. (London: George G. Harrap and Co., Ltd., 1961.) 25*s*. net.

THIS book is intended as an introduction to the subject of electrical measurements for Higher National Certificate students and should meet their need extremely well. The author succeeds in maintaining a uniform standard throughout, and the selection of material is well chosen. There is an adequate number of problems, either worked out fully in the text or given at the end of each chapter, for the student to attempt. Numerical answers are given at the end of the book.

It is inevitable that if the book is to meet the need for which it was written it should lack surprises. The merit is in the presentation rather than in the originality of the material. After a chapter on units and standards, the various types of deflecting instruments are described in seven chapters with a further chapter on integrating meters.

Then follows d.c. and a.c. bridge measurements, electronic instruments, high-frequency, high-voltage and magnetic measurements. Instrument transformers have a chapter and there is a final chapter on calibration of measuring equipment.

Electrical measurement of non-electrical quantities receives no more than three pages as an appendix and the bibliography refers only to books, fifteen in all, and none more recent than 1958. Transistors do not appear to be mentioned.

This, then, is scarcely a book to stimulate the imagination and to encourage further reading. It is a workman-like book designed to help students through their examinations. It appears admirably suited to this purpose, and should be sure of considerable popularity. A. H. M. ARNOLD