

namic, radiative transfer, stellar rotation, and eclipsing binaries.

For many years to come this book will be one that eager apprentices in astrophysics will want to master and know thoroughly. It will also provide her research colleagues of today with a rich background for checking their own studies and for planning future investigations. Its wide coverage of topics and techniques, its frank posing of problems and critical evaluation of proposed solutions, its clarity of presentation and excellence of style all commend Miss Underhill's book.

Many of her colleagues will wish to take exception to one or two of her judgements on controversial issues. Examples are her treatment of the luminosity calibration of the early type stars (she appears not to appreciate the fact that Petrie's and Bertiau's distance determination for the Scorpio-Centaurus group agree within the limits of their respective probable errors), her discussion of the reddening law valid for different portions of the galaxy and her interpretation of the variations of the Beta Canis Majoris stars.

The book is well printed throughout; the reproduction of stellar spectra deserves special credit for excellence. Tables and line drawings are clearly presented. Full references and indexes complete a well planned book.

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Nuclear data

NUCLEAR TABLES, PART 2: NUCLEAR REACTIONS, VOL. 2: THE ELEMENTS FROM ALUMINUM TO SULFUR. By Wunibald Kunz, Josef Schintlmeister. 272 pp. Pergamon Press, Oxford, 1967. \$45.00

by H. H. Barschall

The information explosion in nuclear physics has increased the dependence of the nuclear physicist on data compilations. Those interested in light nuclei, for example, use the classic energy-level compilation of Ajzenberg and Lauritsen, for heavier nuclei Kay Way's Nuclear Data Sheets are available, and those concerned with neutron cross sections rely on the barn books prepared at Brookhaven. Less

well known to US physicists are the monumental *Nuclear Tables* by W. Kunz of Vienna and J. Schintlmeister of Dresden. These authors started their effort while in the Soviet civil service and continued it after their repatriation in 1955. The books are beautifully printed in East Germany in a format reminiscent of Landolt-Börnstein. The latter (published in West Germany), by the way, also contains nuclear energy-level tables.

The publication of *Nuclear Tables* began in 1958 with a two-volume, 1100-page, nuclear energy-level compilation, followed in 1965 by *Nuclear Reactions* for the elements up to magnesium, and this year by *Nuclear Reactions* in aluminum to sulfur. This year's publication covering just four elements led to the present review. Each of the two volumes on nuclear reactions consists of a bound part and a box containing loose folded energy-level charts, typically 0.5 m² in area. For Al²⁷, for instance, 280 levels and transitions between them are shown on six such charts covering over 3 m² when put together. In the text volume measured reaction cross sections are given in tables and diagrams. In addition, reaction energies and properties of energy levels are tabulated. Following each element references (typically 500) are listed; unfortunately many references are to other compilations. Explanations, except for the introduction, are in German, but the amount of text is small enough that a knowledge of German is not necessary for the use of the tables. A critical evaluation of the data is generally not attempted, and contradictory data are shown.

In the fast-moving field of nuclear physics a compilation which is several years old has limited usefulness. The sheer magnitude of *Nuclear Tables* makes it virtually impossible to keep them updated. The volume on the lightest elements includes only data published before July 1962, and a part of it has been made obsolete by the most recent Ajzenberg-Lauritsen compilation although the latter does not contain cross-section tables. The loose and large energy-level charts are awkward and will not survive frequent use; even their elegant containers were received broken by the reviewer. Nevertheless, *Nuclear Tables* should

be a useful source of information for data which are not covered in more recent compilations. The user will wonder how long it will take the authors to complete the herculean task they have set for themselves and when they will be able to update their earlier volumes.

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It's a gas

RAREFIED GAS DYNAMICS. (Advances in Applied Mechanics, Suppl. 4) Conf. proc. (Oxford, July 1966) C. L. Brundin, ed. 1731 pp. in two volumes. Academic Press, New York, 1967. \$18.50 each

by Lawrence Talbot

The scope of the 103 contributions to this symposium is indicated by their division into four main categories: (a) gas-surface interactions (19 papers), (b) kinetic theory (35 papers), (c) transition flow (29 papers), (d) ionospheric aerodynamics (10 papers), plus an additional group of 10 papers on experimental methods. The contributed papers in each group are introduced by invited survey articles that summarize the state of knowledge and indicate the directions of current research in the field. These four survey articles are all of excellent quality and are quite instructive for those workers who are conversant with the general field of rarefied gas dynamics but not specialists in the particular areas covered by these articles.

The first group of papers on gas-surface interactions (survey by F. C. Hurlbut) contains both theoretical and experimental contributions. On the theoretical side, the main effort has been in predicting the energy exchange between molecules and surfaces, using both classical and quantum-mechanical models. Considerable progress has been made here in the two years since the previous 4th symposium though a satisfactory theory is still lacking. The new experimental results reported on energy accommodation, momentum exchange and distribution of scattered particles are indica-