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purpose of elucidating the prospects of interstellar communication, or the scope of unusual information on very different topics, not so often found in one volume. Most of the articles are written on a popular level; others are more technical, but their meaning should be accessible to the intelligent reader.

Astrophysical Quantities (2nd ed.). By C. W. Allen. 291 pp. Athlone, London, 1963. Distr. in US by Oxford Univ. Press, New York. \$10.10.

Reviewed by **Martin F. McCarthy, S.J.**, Vatican Observatory, Castel Gandolfo, Italy.

To publish a book of precise values for astrophysical quantities at this point in the evolution of modern astronomy demands both courage and competence. The first edition, published in 1955, demonstrated the author's courage in facing the challenges offered by unprecedented advances in astrophysics during the first five decades of the 20th century. It also showed his exceptional competence in searching out the most reliable values from the voluminous literature and in presenting these with fairness, balance, and a fine sense of order. The fact that he is called upon again within eight years to publish a second edition indicates the fast pace of astrophysical research. Professor Allen deserves the thanks of his colleagues.

The aim and form remain the same: to present in numerical and tabular form the essential quantitative information on astrophysics. The increase in size has been limited very prudently to 28 pages. The chapters which present the constants of physics remain approximately the same length as before, while the sections devoted to the earth, planets, and satellites; and to the sun, stars, and stellar systems have been amplified. The sections on stellar populations, open clusters and associations, and sources of radio emission reflect very well the new advances made since the last edition. The author has resisted the temptation to include data on space flights and artificial satellites. Special praise is due for the description and use throughout the book of the new system of galactic coordinates.

Readers should start at the very beginning and examine the author's ex-

cellent introduction in which he acknowledges how very changeable constants can be and stresses the importance of understanding the qualifications required in such a compilation. These include ready availability of data, avoidance of ambiguity, conciseness, generality and completeness, accuracy, and evaluation of errors. The principal danger associated with a book such as the present one is that the readers will accept the published values too uncritically in spite of continued warnings. This danger may perhaps be less for the observational astrophysicist than for the theoretician. As an instance of this consider the following example. Since the completion of this edition in November 1962, the accepted value for the distance from the sun to the center of the galaxy has been revised upwards from 8.2 to 10.0 kiloparsecs and the velocity of rotation in the solar neighborhood changed from 215 to 250 km/sec. No author can be expected to issue weekly supplements to his work. Rather one must expect that with the author's precautions in mind, his readers will employ the valuable data compiled here with care but without a blind and absolute acceptance.

The references are exact, concise, and a clear guide to the literature. A "must" for every library, this excellent book merits a place on the desk of every astronomer.

Matrices and Tensors. By G. G. Hall. Vol. 4 of Topic 1 of The International Encyclopedia Of Physical Chemistry And Chemical Physics, edited by E. A. Guggenheim, J. E. Mayer, and F. C. Tompkins. 106 pp. (Pergamon, Oxford) Macmillan, New York, 1963. \$6.50.

Reviewed by **J. Gillis**, Weizman Institute of Science, Rehovoth, Israel.

The development of high-speed computing machines has stimulated a growth of interest in linear algebra, and a large number of books on the subject have appeared in recent years. However, most of these have been addressed to the professional computer specialist or mathematician and are too detailed to be useful to chemists. In the circumstances there was room for a book like the present one which concentrates on a lucid and concise presentation of the topics most likely to occur in physico-chemical research.