

be appreciated? There are many fine papers among the 14 contributions assembled here, admirable both as reviews and as stimuli for further research. The laudable trusteeship of Maheshwari, who has fostered many students and many studies, is evident. Additionally, there are workers becoming worthy of recognition for consistently fine production. To mention selected names would only be invidious, for many chapters are excellent. The chapters dealing with so-called descriptive aspects are the best, and demonstrate that, instead of reaching a point of exhaustion, embryology is opening unexpectedly broad vistas for new research. Because recent studies show relationships with physiology, cytology, genetics, and plant breeding, the editor's hope that this book will reach a wider audience is reasonable. The editor has deliberately cultivated a spectrum of interests, and the reader is likely to find much of value in the taxonomic and genetic implications. One brief chapter, which deals with a problem in morphogenesis and offers predictions of what evidence will be needed and prophecies of what will be found, should have been omitted, however.

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Satellite Probes

Space Physics. Donald P. LeGalley and Alan Rosen. Eds. Wiley, New York, 1964. xx + 752 pp. Illus. \$25.

This book, which contains 18 "chapters" first presented as lectures in a statewide series sponsored by the University of California in the spring of 1964, answers a need that has been growing during the past few years for an organized, effective presentation of the physics of our space program. The editors and the 19 contributors are outstanding men in their fields and well qualified for their roles as authors; they have correlated their efforts and present an integrated coverage of the subject. The book is divided into four basic parts: Experimental Techniques for Space Physics, Solar and Planetary Physics, Fields and Plasmas in Interplanetary Space, and High Energy Radiation in Space.

For the scientist, the book will provide an excellent review of rocket and satellite experiments as well as the

pertinent theory for understanding the results. An advanced background in physics is generally required for complete appreciation of the many topics. However, the beginner in the field can follow the general outlines, and he can refer to the excellent bibliography for further study. In many chapters there are concise theoretical developments of certain topics not previously presented in unified form; thus, the nonspecialist can quickly achieve an insight that will prepare him for original research in the space field. The problem of the solar plasma is an example.

Space engineers will find the book valuable as an aid in the design of spacecraft and instruments for space physics research. Part 1, which is devoted to general problems of this kind, presents knowledge acquired from space experiments to date. Throughout the book, along with the physics of the experiments, the authors make frequent reference to details of specialized instruments and to the basic engineering problems involved.

The technical administrator will welcome the many hints about worthwhile problems for research. Most of the chapters conclude with a summary of the state of progress in a given field and with suggestions for experimental programs. Despite the large number of contributors, the book is basically well written, and the reader can obtain qualitative understanding without appreciating all the mathematical and esoteric details. Naturally, since many of the topics are particularly difficult, there are some exceptions. The excellent introductory chapter is a fine general review of the broad features of the various past and present space programs that have yielded results in scientific missions.

A partial list of the specific topics covered in the book includes radiation spectrum of the sun; physical and chemical aspects of the atmospheres of the planets, including the earth; observational and theoretical results of aurora measurements; micrometeoroids; interaction of the geomagnetic field in the solar plasma; interplanetary magnetic fields, hydromagnetic waves; trapped-radiation zones; effects of high-altitude explosions; solar and general cosmic rays in space; and problems of radiation hazards in space.

In most chapters the historical background for the topic is sketched, so that the reader may become quickly familiar with the evolution of the topic

during the years before the advent of space measurements (Sydney Chapman's chapter, "Aurora and geomagnetic storms," is a case in point). As one reads further in a given chapter, the enormous contribution of the space age is thus more forcefully apparent. The book will inspire enthusiasm for the importance of the space effort to date, and for its continuation as a necessary component of our search for solutions to many problems in the understanding of our natural environment.

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A General Reference Source

The Harper Encyclopedia of Science. vols. 1-4. James R. Newman, Ed. Harper and Row, New York, 1963. 1379 pp. Illus. \$35.

There is, no doubt, always room for another well-done general reference work on science, and *The Harper Encyclopedia* fulfills its editor's avowed intention of producing a useful work for the "common reader"—that is, the student, the teacher, and the nonspecialist.

This new work with its four Britannica-sized volumes occupies a middle ground between the one-volume encyclopedias and its longer and considerably more expensive rival in the field, the 15-volume *McGraw-Hill Encyclopedia of Science and Technology*.

Despite its title, articles in the Harper encyclopedia are well divided between science, narrowly defined, and technology. Substantial space is given to articles on medicine, engineering, and photography, for example. And what might be viewed as auxiliary subjects, such as logic and the history and philosophy of science, figure fairly prominently among the 4000 articles.

In general, the editor has adhered to his announced policy of opting for longer and fewer articles, and the reader is seldom compelled to pursue a subject back and forth through the four volumes. The credentials of the 450 authors are impeccable, the prose is clear, and the editor seems to have been quite successful in pruning the articles of nonessentials. Difficult subjects, however, have not been oversimplified or popularized.

The volumes are attractively de-