Koji Hidaka Volume

Studies on Oceanography. A collection of papers dedicated to Koji Hidaka. Kozo Yoshida, Ed. University of Washington Press, Seattle, 1965. vi + 568 pp. Illus. $20.

Koji Hidaka, who was born in Miyazaki Prefecture in 1903, was educated as a theoretical physicist at Tokyo Imperial University and joined the Kobe Imperial Marine Observatory in 1926. During the next 10 years, despite averaging more than 100 days a year at sea in the *Shumpu Maru*, he found time to publish more than 40 papers on theoretical oceanography. In 1942 he was appointed professor of geophysics at the University of Tokyo and, in 1962, he was also made director of its new Ocean Research Institute. When he retired last year, some 75 of his friends, colleagues, and former students in Japan and abroad joined in publishing this handsome commemorative volume.

Of the 61 studies in the book, four-fifths are in English. Japanese, German, French, and Russian are also represented; all have English abstracts. In view of Hidaka's own interests, an emphasis on theoretical physical oceanography in a dozen papers is not surprising. Techniques of measurement and descriptive oceanography nevertheless receive attention, and such features as the East China Sea, the North Pacific, the Caribbean, Kuroshio, and the Pacific North Equatorial Current are described.

Surface waves, internal waves, and tsunamis are also well covered, and three papers deal with sea level oscillations or the effect on sea level of wind. Three papers are concerned with optical properties of sea water, and one with the electrical conductivity of sea foam. Ice in the Okhotsk Sea, carbon dioxide micrometeorology over crops, and insolation at Ocean Station PAPA are other topics treated.

In the geophysical area are a comprehensive theory of the growth of ocean basins and continents, descriptions of current work in the western South Atlantic, and an analysis of coherent electrical and magnetic fluctuations in the sea off Honshu. Of geological interest are accounts of eustatic movement, buried rivers, and Rias coasts along the Japanese littoral and of the distribution of oceanic sediments in general and turbidites in particular. Chemical oceanography is represented by a study of uranium and radium in the North Pacific, paleontology by an analysis of Upper Jurassic climate as inferred from reef corals, and biological oceanography by a review of studies with continuous plankton recorders.

The volume includes a brief biography of the propositus and a bibliography of his works in European languages. It lacks an index, even an index of authors, a curious omission from an otherwise comprehensive portrayal of the present state of the art in oceanography.

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Astrometry

Fundamental Astrometry: Determination of Stellar Coordinates. V. V. Podobed. Translated from the Russian edition (Moscow, 1962) by Scripta Technica. A. N. Vyssotsky, Translation Ed. University of Chicago Press, Chicago, 1965. xii + 236 pp. Illus. $7.50.

This is the first English language text of the century to be devoted entirely to the subject of positional astronomy. It supplements but does not replace any of the existing texts on practical and spherical astronomy. The book is based on lectures given at the Moscow University to students who were specializing in astrometry and to those who were just beginning their study of positional astronomy. It is not an advanced text. A number of positional astronomy instruments are described, and methods commonly used to determine their errors are presented. The author also shows how these instruments may be used to determine both "relative" and "absolute" positions of the stars for the improvement of the fundamental celestial coordinate system.

The fact that many of the instruments and methods dealt with are those likely to be available to the student in Moscow does not detract greatly from the general usefulness of the book. Positional astronomers everywhere will find this text interesting and helpful, even though they prefer to use methods other than those described in the text for some of their work.

Chapter 10 presents the general principles involved in the determination of the positions of the stars by photographic methods. The presentation is quite conventional and stops at the point where troubles usually begin.

The last two chapters should appeal to a broader group of astronomers than any of the others. A brief history of the development of star catalogs and fundamental systems, from ancient times to the present, precedes a summary of the methods used to exhibit the errors of star catalogs and an outline of the programs now in progress for improving the fundamental reference system used by astronomers.

Fortunately, good editing eliminated most of the difficulties with technical terms usually encountered in translations. It is regrettable, however, that the names Backlund, Fabritius, and Uhink were allowed to come out as Baklund, Fabricius, and Whink.

Apart from a number of typographical errors and two references to a frontispiece that was not published in this edition, the translation and editing of the text were quite well done. This is a book that any astronomer could read with profit if he wishes to gain a general knowledge about star catalogs and the meticulous care that goes into their preparation.

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Berkeley Physics Course

Mechanics: Berkeley Physics Course. vol. 1. Charles Kittel, Walter D. Knight, and Malvin A. Ruderman. McGraw-Hill, New York, 1965. xxii + 480 pp. Illus. $5.50.

This book is the first of five volumes prepared for a 2-year elementary physics course for college students majoring in science and engineering. The course is intended ". . . to present elementary physics as far as possible in the way in which it is used by physicists working on the forefront of their field." In this first volume the authors have succeeded admirably in this objective. Their lively style, the liberal use of order-of-magnitude estimates, and the inclusion of verbatim extracts, ranging from Newton to Einstein, all contribute toward the attainment of their goal. In this respect the

book might be compared with *The Feynman Lectures on Physics*, which it resembles closely both in style and format.

The book, which might more accurately be entitled "Particle Dynamics," commences with introductory chapters on the relation of physics to the natural world, on vectors, and on Galilean invariance. The next six chapters treat classical mechanics, including simple particle dynamics, the conservation of energy and momentum, the harmonic oscillator, elementary rigid-body dynamics (to be omitted from a minimum program), and inverse-square-law forces. After a descriptive chapter on the speed of light, one finally arrives at the primary goal of this volume, the Lorentz transformation of space and time (chap. 11) and of momentum and energy (chap. 12), ". . . a necessary prerequisite for the development of electricity and magnetism in Vol. II." The book concludes with a brief discussion of the principle of equivalence and a summary of elementary facts about the more important particles of modern physics.

Occasionally the authors' loose style leads to a certain vagueness. For example, the statement (p. 36) that the vector product is ". . . a vector in a somewhat restricted sense," without further explanation, is likely to perplex the student. Again, the statement that "The laws of mechanics of a mobile electron inside a fixed crystal may be quite unlike the simple laws which prevail in empty space" (p. 49) seems to imply that the laws of mechanics do not have universal validity. On the whole, however, the book is to be recommended, especially as a textbook for those students who are planning to major in physics.

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Space Engineering: Satellite Environment Data

Satellite Environment Handbook. Francis S. Johnson, Ed. Stanford University Press, Stanford, Calif., ed. 2, 1965. xiv + 193 pp. Illus. $7.50.

According to the editor of this handbook, "The first edition . . . was prepared in response to numerous requests from space engineering projects for the best available data on satellite environment." The appearance of a second edition some 3 years later is testimony to the success of that response and it is most welcome in view of the pouring forth of satellite data at "a bewildering rate" in the interim.

The eight short chapters survey the upper atmosphere, the ionosphere, energetic charged particles, solar radiation, micrometeorites, radio noise, terrestrial thermal radiation, and geomagnetism. The contributors—A. J. Dessler, W. B. Hanson, F. S. Johnson, H. C. Ko, B. J. O'Brien, and J. F. Vedder—are well abreast of their fields and have done an admirable job of summarizing their topics. Most of the chapters give rather thorough documentation for the data and results reported.

This book is intentionally brief, and as you might expect, the treatment of theory is generally superficial. It is also true that in such brief reviews, where the emphasis is on setting down the facts, it is not always possible for the authors to emphasize uncertainties and alternate points of view or interpretations as much as they might like to do. For these reasons I wish that each chapter had listed separately from the other references, perhaps with annotations, a number of current review articles that a reader could consult for additional study. With this one mild reservation, I can recommend the book as fulfilling its stated intent.

The editor's preface reminds us that, since the first edition was published, the basic ideas in space physics have changed surprisingly little, especially when measured against the avalanche of new data, a fact that might give us pause. It at least raises the question, with respect to much of space physics, of whether theory is playing its traditional role in the scientific method: Is theory made to serve sufficiently as the bridge that leads us to new observations from the results of older ones, or are we too often merely collecting those data that are collectable? In any event, let us hope that future editions will be able to record, in addition to the inevitable flood of new facts, substantial advances in our understanding of the "satellite environment."

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Antarctic Expedition

The Royal Society International Geophysical Year Antarctic Expedition. Halley Bay, Coats Land, Falkland Islands Dependencies, 1955–59. vol. 4, *Meteorology, Glaciology, Appendixes*. Sir David Brunt, Ed. Royal Society, London, 1964. 414 pp. Illus. $23.

In the preface to this valuable documentary, Sir Graham Sutton advises that it completes the record of the Royal Society Expedition to Halley Bay, Antarctica. Although the title emphasizes the principal subjects—meteorology and glaciology—the appendixes cover a wide field of additional topics such as embryology, physiology, oceanography, radio communications, and significant logistics information. The introduction, by Sir David Brunt, has been reprinted from volume 1, with slight modifications. Sir David reviews the development of international scientific efforts that led to the International Geophysical Year, 1957 and 1958, and provides an interesting résumé of committee activities and of personnel involved in the planning as well as in the actual antarctic operations. The editor's preface, which is also by Sir David, gives factual information on the technical contents of the volume. It is interesting to note that what some might interpret as a discrepancy in stating the position of the Royal Society base is in fact due to the westward movement of the ice shelf (approximately 365 meters or 1200 feet per year). These preliminaries would, perhaps, have been even more complete if the historical review had been extended into the post-IGY period to include mention of the Scientific Committee on Antarctic Research (SCAR) and the antarctic treaty.

The section on surface meteorology, by MacDowell, Ellis, and Limbert, comprises about two-thirds of the volume. It includes interesting paragraphs on the environment of the base, the methods of observation, instrumental performance, and a discussion of results. A large portion is devoted to tables that give results of synoptic observations made by MacDowell, Ellis, and Limbert.

The section on glaciological observations is divided into two parts. In the first, MacDowell discusses observations in the vicinity of the base, and in the second, MacDowell, Bar-