

before proceeding to more general or complex questions. Although this exposition, of necessity, does not lack mathematical content or discussion, the accent is strongly on the physical significance of the results. In those cases where it is appropriate, the author emphasizes (but does not belabor) the macroscopic aspects of field problems, such as equivalent circuits and impedances. An interesting aspect of the treatment is the systematic use of a step-by-step approximate method for the calculation of quasi-static fields, and general attention to approximate solutions (and their validity). In addition to examples discussed throughout the text, the book contains nearly 100 pages of problems with answers or hints for solution. While the presentation begins at a relatively elementary undergraduate level, it proceeds through many important aspects of waveguide cavity and antenna problems. It should prove particularly valuable to those readers who wish (or need) to apply electromagnetic theory in an understanding way to certain specific problems on their own merits, rather than as special cases of more general mathematical solutions.

Astronomy. By Robert H. Baker (8th ed.). 557 pp. Van Nostrand, Princeton, N.J., 1964. \$8.25.

Reviewed by Bruce W. Shore, Harvard College Observatory.

Dr. Baker's book has been popular with astronomers since it was first published in 1930. Written as a college-level text, it became a favorite with many amateur astronomers. Newcomers to astronomy, young and old, have used "Baker" as a concise dictionary of astronomy, for it requires no background in science, and only the mathematics of sine, logarithm, and powers of ten. In a direct and compact style, it introduces the nomenclature of astronomy, and presents the facts, as we now know them, about our universe.

The present version retains the sound basic structure of the first edition, patterned after the standard reference by Russell, Dugan, and Stewart. This outline retains its cogency today, despite remarkable advances in all branches of astronomy. Like other older texts, this one begins with "Aspects

of the Sky," including useful black-on-white star maps. A description of the earth, its motions, and "Timekeeping" follows. (The section on celestial navigation, prominent in earlier editions, was pruned away here.) Next come chapters on the moon and eclipses, as the discussion progresses through the solar system to planets, comets and meteors, and the sun. Four chapters then discuss the general properties of stars, stellar atmospheres, variable stars, and binary stars. The final four chapters cover star clusters, nebulae and interstellar matter, our galaxy, and exterior galaxies.

Frequent revisions — roughly four years apart — have contributed to the popularity of this book as a descriptive text and reference work. Each edition bears the mark of extensive rewriting. Even so, much remains of the first edition, and nowhere is this more evident than with the illustrations; numerous line drawings and half-tone illustrations from the 1930 version give a "dated" look not found in more recent books. On the whole, the book is adequately up to date, but numerous gaps remain. An obvious oversight occurs in the section on comets: the comet Seki-Lines is pictured and described during its return in 1962, yet it is not listed in the table of recent comets. The table of periodic comets lists no observations since comet Encke's 1957 return; and the reader might suppose this comet went unobserved during its 1961 passage.

The eighth edition inherits several weaknesses. A reference book is no better than its index, and the amateur astronomer seeking answers to common questions will frequently meet frustration in this index. The author index for the first edition was deleted long ago, and the present edition provides no guide to its discussion of the Zeeman effect or the Saha equation. Both G. Kuiper and W. W. Morgan are quoted at some length; neither appears in the index. Equipment too, though discussed in the text, occasionally misses the index (e.g., Coelostat and Heliostat). The several paragraphs on artificial satellites are parceled out among various chapters; none is accessible in the index.

A pedagogical weakness is the descriptive approach. The author stresses

new low-cost deuterated solvents

deuterated benzene, chloroform, acetone

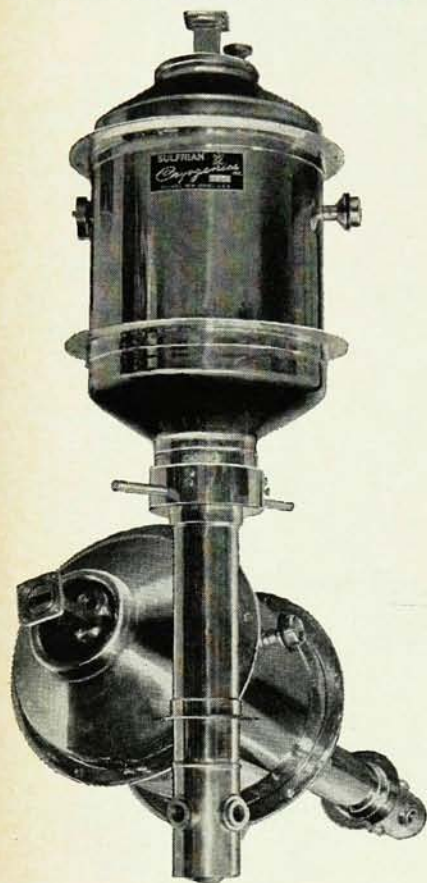
A new process developed by CIBA enables these compounds to be offered at greatly reduced prices.

These products meet or surpass the high quality standards of NMR spectroscopy. They are also of interest as a chemical intermediate or general research tool. For technical bulletin and price list write:

Dept. DC
CIBA CHEMICAL & DYE CO.
Fair Lawn, New Jersey

C I B A

SULFRIAN STAINLESS STEEL LIQUID HELIUM MICROWAVE DEWARs



For use in the evaluation and measurement of K-band microwaves, optic and X-irradiation, and electrical inputs. The K-band waveguide, waveguide flange, and electrical inputs are all included. Bottom sample block designed for a resonant cavity and contains five optical viewing ports. Quartz or beryllium windows may be used. Liquid helium capacity is two liters. Liquid nitrogen capacity three liters.

Send for
64-Page
Catalog
on Cryogenic
Equipment



SULFRIAN
Cryogenics, INC.

1290 Central Ave., Hillside, N. J.
Phone: ELizabeth 5-1975

new observations and current interpretations and gives little indication of the numerous puzzles and questions that these observations raise.

No question remains unanswered, though competing theories do share credit at times. Thus students may view astronomy as a collection of facts now known, rather than a collection of questions to be answered.

The book will remain a useful reference accessible to readers without a college math or science background. Numerous problems and a few recent references with each chapter aid the student. However, several more recent books—Krogdahl's "The Astronomical Universe" is a good example—merit higher grades as a modern college text for many schools.

Lasers and Applications. Symp. Proc. (Columbus, Ohio, 1962) W. S. C. Chang, ed. 267 pp. Ohio State Univ. Press, Columbus, 1963. \$7.00.

Reviewed by H. J. Hagger, *Albiswerk* Zürich, Switzerland.

The field of quantum electronics which the lasers belong to has advanced very rapidly, and new discoveries follow each other. So in this situation a symposium conducted in short sequence on such a very special subject seems necessary. A collection of papers of the Symposium on Lasers organized in Columbus, Ohio, November 7-8, 1962, is presented by W. S. C. Chang. Optical and semiconductor lasers are considered. The most recent and interesting materials, such as CaF_2 , and new pumping methods are described, e.g., double pumping, pumping by exploding wires, etc. Nonlinear properties, especially in connection with modulating and mixing optical frequencies, as well as parametric photo interaction between radiation and matter, are studied. In the application section, absorption in water vapor of laser radiation and satellite tracking systems are considered. Some experimental results on coherence of laser output and on the interference patterns of the ruby-laser end surface are given.

This book gives a good survey on the state of the art, and it may serve well as a collection of data and ideas and as a discussion of the most recent problems. It is intended for the man

working in lasers, and it fulfills this purpose very well. Thus it can be highly recommended in this respect, but one must look at it as a survey book on the state of the art which may be out-dated to some extent at the moment the next symposium is held or entirely new discoveries on this subject are made.

Waves and Oscillations. By R. A. Waldron. 135 pp. Van Nostrand, Princeton, N. J., 1964. Paper, \$1.75.

Reviewed by Richard V. Waterhouse, *The American University*.

This is the fourth of a series named Momentum Books, issued under the general editorship of E. U. Condon. These books, says the blurb, "were conceived with a purpose . . ." (no labours of love here, presumably!) "to serve the modern inquiring mind. Scientist, engineer, teacher, student, inquisitive layman . . . will find, etc. etc. Each Momentum book is a lucid and accurate analysis of an area of . . . physics".

In pursuit of this compendious goal, the author proceeds to pack a good collection of material into the pages at his disposal. In compiling such a book, there is a huge amount of material to choose from, and it seems reasonable for an author to follow his personal taste in the selection. Here electromagnetic waves, in and out of wave guides, receive the most attention, and this reflects the main professional interest of the author. There is a gesture in the direction of wave mechanics: the author devotes 2 pages to Schrödinger's equation and the uncertainty principle, but for the rest the waves treated are classical ones. Reflection, refraction, interference, and diffraction are discussed. Masers are mentioned, but only in a footnote.

The treatment is mostly at an undergraduate level, although the author occasionally drops a more recondite titbit to spur further investigation; for example, he mentions that the real and imaginary parts of the impedance of an electrical network, given as functions of frequency, are mutually dependent, being a pair of Hilbert transforms.

The use of language is generally adequate although in the introduction the author manages to contradict