

PHYSICISTS

Schlumberger Well Surveying Corporation maintains a program of long-range industrial research projects at its Research Laboratory in Ridgefield, Connecticut.

The program includes such scientific fields as nuclear magnetic resonance, electromagnetic theory, nuclear physics, electronic systems, physical chemistry, wave propagation, data processing, sonics, and physical electronics.

In order to implement our diversified program we have openings for two professional staff members on a permanent staff of more than 100.

MATHEMATICAL PHYSICIST

The position requires a scientist with a Ph.D. in physics, applied mathematics or electrical engineering, with a strong interest in theoretical work. The applicant should have at least two years of experience in the use of mathematical techniques for the formulation and solution of physical problems.

Knowledge of transport theory, wave propagation or information theory are particularly useful. Specific projects cover a wide spectrum from rather short feasibility studies to long term research programs in the fields mentioned.

PHYSICIST FOR ACOUSTICS

This scientist should have an advanced degree in acoustics or geophysics with at least three years practical experience in ultrasonics, sonar or seismology.

The research program underway covers experimental and theoretical work in the measurement of acoustical properties of materials, particularly geological formations.

Our Laboratory is located in a small Connecticut town about 60 miles northeast of New York City. The facilities at the Laboratory are extensive and modern. Working conditions and fringe benefits are consistent with the highest industrial standards. Please send brief resume to:

MR. J. J. McNAMARA

**SCHLUMBERGER WELL
SURVEYING CORPORATION**

P. O. Box 307

Ridgefield, Connecticut

nomena and diffusion processes, focusing properties of electromagnetic fields with applications to modern devices and instruments, and gaseous electronics, and also gives a clear and rather detailed account of crystal structure and the lattice theory of metals.

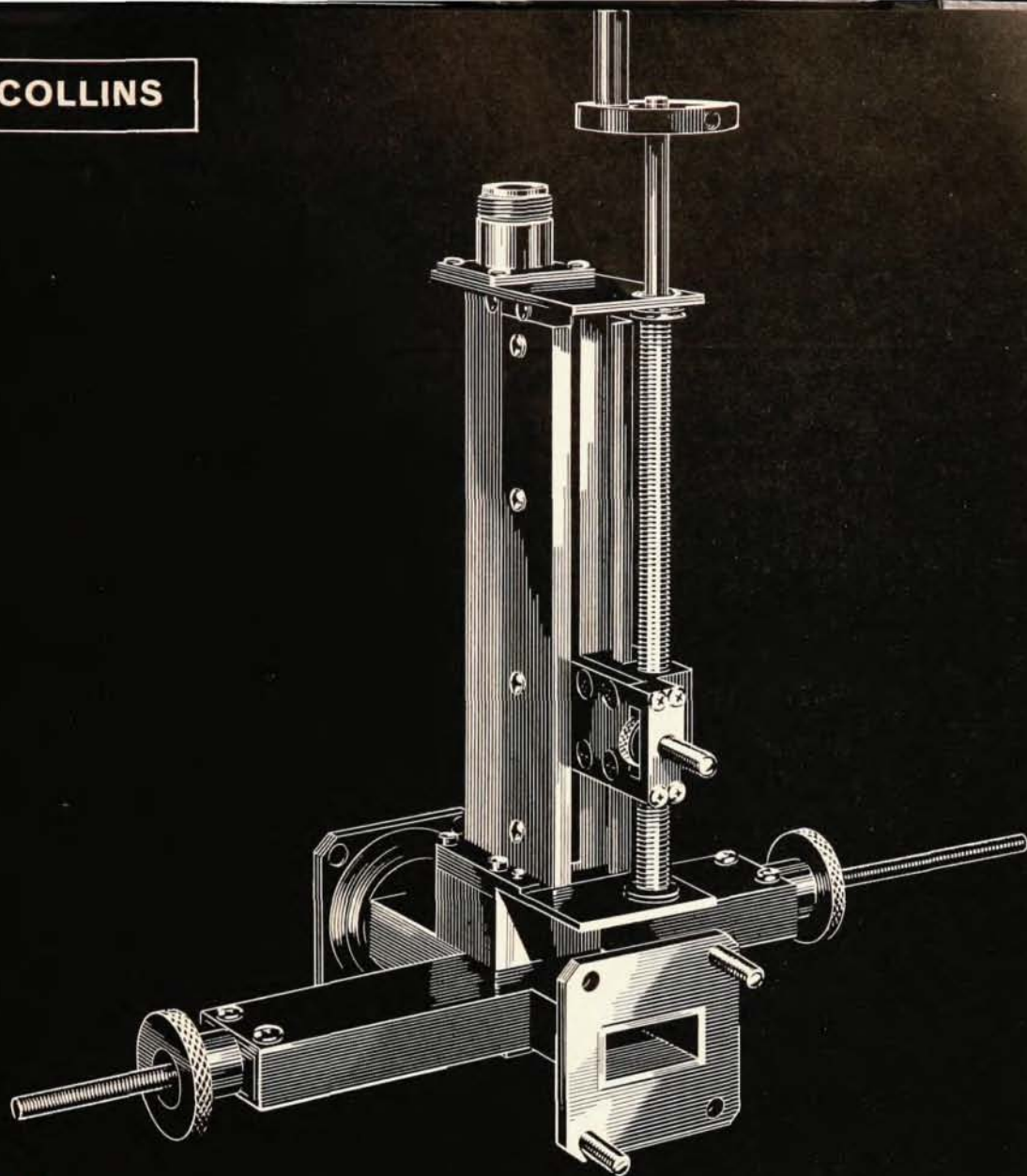
In view of the encyclopedic manner in which the author has written, it seems to the reviewer that several important topics have been omitted or barely touched upon in the text, namely, the mathematical formulation of the principles of quantum mechanics from the point of view of the modern theory of linear operators and the application of this powerful mathematical method to continuous spectra and scattering processes which are necessary for the understanding of the present development of nuclear theory. The reviewer is also somewhat perplexed by the complete absence of references to original papers and especially to current literature in connection with the chapters on field theory and nuclear structure—a somewhat anomalous phenomenon for a German book—since to the reviewer this treatise has the character of a reference work rather than a textbook.

In spite of these drawbacks, the present volume is an important contribution to the growing number of works on theoretical physics and together with the first volume, they form one of the best and most comprehensive works in classical and modern theoretical physics.

Optical Properties of Semi-conductors. By T. S. Moss. 279 pp. (Butterworths, England) Academic Press Inc., New York, 1959. \$9.00. Reviewed by Paul W. Levy, Brookhaven National Laboratory.

MOST of the present interest in the optical properties of semiconductors stems from their use in infrared sensing devices and solar energy converters. The reviewer has concluded—with full regard for the meager statistics involved—that persons interested in semiconductors for electrical applications have relatively little knowledge of optical properties, while in contrast persons interested in optical applications are completely familiar with purely electrical phenomena. Both of these groups will find *Optical Properties of Semi-conductors* of interest. Like the previous book by this author, *Photoconductivity in the Elements*, it is divided into two parts. The first part is a survey of the basic physical principles involved and the second part describes measurements on specific materials. The first part of this book is a discussion of optical phenomena in semiconductors. It begins with a discussion of electro-optical properties of solids in terms of Maxwell's equations. Then the absorption of light from both the macroscopic and microscopic viewpoint is considered. Photoelectric effects, magneto-electrical-optical effects, and the emission of radiation from semiconductors constitute the remainder of the first half. Unfortunately, a few subjects are considered with a degree of detail that should be reserved for appendixes while some subjects are described so briefly that the only thing accomplished is to point out the existence of a reference.

RESEARCH AT COLLINS



THE UNUSUAL SHAPE OF PROGRESS

A company sponsored research program to investigate the operation of parametric amplifiers has resulted in improved communication equipment in the uhf frequency range. Collins engineers decided to attack the problem from the standpoint of circuitry rather than device design, and the two-port uhf parametric amplifier shown above emerged from Collins Research Laboratories. Final development resulted in an amplifier with a gain-bandwidth product more than twice that of previous amplifiers.

In the Advanced Circuits Division of Collins Research Laboratories, physicists, mathematicians and engineers are planning basic research programs in solid state physics. Research in the field of thermoelectric phenomena is now in progress. Other studies are being conducted in this division in the general area of modulation and information theories, and traveling wave principles. To further this work, and to advance scientific knowledge with the resultant development of new technologies in other areas, unique professional opportunities are now being offered by Collins Research Division in radio astronomy, advanced circuits, advanced systems, antennas and propagation, mechanical sciences and mathematics. Your inquiry is invited.



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Physical Chemists

Challenging opportunities exist at the senior scientist level with background and/or experience in:

- The thermodynamics of highly refractory compounds. This includes experimental studies of vaporization at high temperatures and calculations of thermodynamic functions of the condensed phases up to 6000° K.
- Basic experimental and theoretical studies of chemical reactions of highly refractory compounds with gases at very high temperatures with particular emphasis on the kinetics of surface reactions.
- X-ray diffraction studies of new high temperature and solid state materials.

Send resume to
Mr. Richard Rubino
Scientific and Technical Relations

AVCO

Research & Advanced Development

A Division of Avco Corporation
201 Lowell St., Wilmington, Mass.

However, most material is presented in a satisfactory way. The second half of this book describes measurements, of both optical and related processes, on a considerable fraction (so many there is no point in listing them) of the known semiconductors. This material is presented in a way that emphasizes physics and as such will be appreciated by physicists. Anyone attempting to use this book as an optical device handbook may be disappointed. However, this will not be the case if he uses it as an aid to obtaining an understanding of the optical properties of semiconductors.

The utility of this book—and many others—would be considerably improved if it contained a list of symbols with short definitions (and possibly the number of the page on which each was introduced). This shortcoming becomes really apparent when one attempts to refer to the book a month or two after having read through it. Certainly this omission is the responsibility of the publisher.

Properties of Matter (3rd Revised Ed.). By F. C. Champion and N. Davy. 334 pp. Philosophical Library, Inc., New York, 1959. \$10.00. *Reviewed by M. W. Friedlander, Washington University.*

WITH the present publicity attendant upon matters nuclear and atomic, with the current emphasis on such topics in university courses, and with an ever-increasing deluge of related books, it is well to remember that very large areas of pure and applied physics require an understanding of the classical properties of macroscopic quantities of matter. This is so even though we can now "explain" these areas in terms of nuclear, atomic, and molecular properties.

There is a need for books which give a well based introduction into this area. That is not to say that these subjects need necessarily be included in detail in university curricula—the physical concepts involved can be discussed, and the elaborations, such as in the book under review, are within the grasp of competent students, for whom the limited time of the academic career should be reserved for more important things.

This book, first issued 25 years ago, is "intended for the advanced student"—presumably one in his final undergraduate year. What should be the scope of such a book? In the opinion of this reviewer, it should provide an introduction to the chosen topics, from which a student may proceed to a more exhaustive examination should he wish. An essential for this is a useful supply of references to the more detailed works, and here the book is sadly deficient. Less than ten references are given to works published later than 1950. In particular, there is no reference in the chapter on atomic constants to the book by DuMond, Crowe, and Cohen (published a year before the date on the preface to this latest edition of the book under review). Other similar omissions could be cited.

More generally, it is a valuable exercise for advanced students to refer to selected original papers, and the paucity of references in this book is to be deplored.