

plied physics. It seems uncertain that it could serve well in that role—perhaps a chemistry student would be more in tune with the general approach.

The book could be characterized as a qualitative account of the electrical properties of solids. There is no coherent theoretical basis to tie together the catalogue of facts or semifacts given. An extreme but nevertheless illustrative case is the temperature-dependence of conduction. Suchet states that ionic conductivity varies as $\exp(-Q/RT)$ while semiconduction varies as $\exp(-E/2kT)$. It is indicated that these "are more or less related to temperature in the same way" because exponential laws occur frequently in physics. Thus the unity of the subject is lost even in cases where one would have thought it inescapable.

One unusual feature of the book is the discussion, again qualitative, of a large number of applications of solid conductors, with tables relevant to these applications. Perhaps this aspect will prove attractive to some readers, though physicists will probably prefer a book such as John McKelvey's *Solid State and Semiconductor Physics* (Harper and Row, 1966), which emphasizes the theoretical background rather than the technical details and can therefore provide a basis for going beyond the applications that are explicitly discussed.

WALTER A. HARRISON

Department of Applied Physics
Stanford University

Practical Quantum Mechanics

S. Flügge

618 pp. Springer-Verlag, New York, 1974.
\$14.80

As the different branches of physics diverge to an increasing extent, quantum mechanics remains as one unifying element common to all of physics. For this reason, any original exposition of the subject of quantum mechanics is of interest, despite the existence of a number of excellent monographs. Siegfried Flügge, best known as the editor of the *Encyclopedia of Physics*, has provided us with a new look at the subject in his *Practical Quantum Mechanics*, now published as a single volume.

The original German edition, more appropriately entitled *Calculational Techniques in Quantum Mechanics* (*Rechenmethoden der Quantentheorie*), appeared many years ago. A completely revised and enlarged edition divided into two volumes appeared in English in 1971, as *Grundlehren der mathematischen Wissenschaften*, Vol-

Somebody goofed!

The story of a calculator that doesn't do everything it was designed to do.

50,000 UNITS LATER

After 50,000 integrated circuits (the heart of the calculator) were manufactured by a world famous CHIP manufacturer, someone discovered an error in the algorithm program. This is the mathematical formulas electronically built into each integrated circuit. This error is ONLY apparent in calculating the arc cos of 0 however, and **none of the other functions were affected**. Rather than discarding these 50,000 chips, a quality calculator manufacturer, MELCOR, decided to take advantage of the situation. After all, not everyone needs the arc cos of 0.

THE CHIP ERROR AND WHAT IT CAN DO FOR YOU

For a limited time, Chafitz is offering what is sure to be a first in the calculator field. A limited quantity of quality calculators with a CHIP ERROR. Due to this chip error the MELCOR 635 is not able to calculate the arc cos of 0 (which everyone knows is 90 degrees). But, at our unbelievable low price, who cares about the error. Just remember that the arc cos of 0 is 90 degrees and you've got a perfect calculator at the incredibly low price of only \$59.95.

LOOK AT WHAT YOU DO GET

A 40 key calculator with 23 functions • 8 digits with scientific notation • Two levels of parenthesis • Algebraic logic • e^x , $\ln$, 10^x , $\log$, SIN, COS, TAN, $\sqrt{x}$, x^2 , $1/x$, $n!$, y^x , π • Radian and degree calculations • Arc SIN, COS, TAN • 3 button accumulating memory • Register exchange • Sign change • Rechargeable, with NiCd batteries including • Plus much more •

Accessories included: A/C adapter/charger, leather case with belt loop, instructions. Also, one year parts and labor warranty.

For the scientist, student, mathematician, engineer, businessman!

\$59.95*

Due to the amount of machines produced we will have to fill orders on a first come first serve basis. So hurry, you don't want to goof by not getting one of these incredible machines!

10 DAY NO RISK TRIAL

If you can't believe this offer, try the calculator for 10 days in your home or office. If you feel it doesn't do everything we say it does, return the complete package for a prompt refund.



*** SAVE MONEY**

Buy 2 for \$112, 4 for \$218, or 6 for \$318

Remember, you can't calculate the arc cos of 0. But at \$59.95 who cares!!!

AMERICA'S CALCULATOR COUNSELORS™

ORDER NOW—TOLL FREE

800-638-8280

Maryland residents call 301-340-0200
MAJOR CREDIT CARDS ACCEPTED.
Our Calculator Counselors are on duty from 9-9 Mon.-Fri. and 9-5 Sat. EST

Add \$2 per unit when ordering
Maryland residents remit 4% sales tax

**WHEN YOU THINK
CALCULATORS,
THINK**

Chafitz 1976

PO Box 2188 Dept. 726
Rockville, Maryland
20852

Circle No. 33 on Reader Service Card

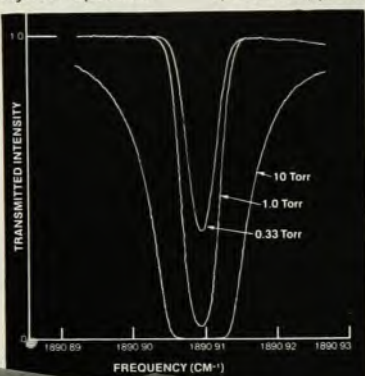
Tunable diode laser instruments from the technology originators

Laser Analytics, Inc., the company whose founders developed the technology, now offers you a family of infrared analytical spectroscopy instruments based on tunable diode lasers. Features include 0.0001 cm^{-1} resolution, rapid spectral scanning, and complete spectral coverage between 2.7 and 33 micrometers.

Actually a new class of analytical instruments which provide precision measurements

never before possible, tunable diode laser instruments are used in ultra-high resolution spectroscopy, laser photochemistry, isotope

separation, pollution monitoring, process control, heterodyne radiometry, infrared detector characterization, and other applications. For complete information, write Laser Analytics, Inc., 38 Hartwell Avenue, Lexington, Massachusetts 02173. Or phone 617-862-0884.



LASER ANALYTICS, INC.

38 HARTWELL AVENUE, LEXINGTON,
MA 02173 (617) 862-0884

Circle No. 35 on Reader Service Card

JARRELL-ASH MONOCHROMATORS



JA 82-405

JA 82-405
Focal Length — 250mm
Focal Ratio — 7.5
Slit Length — 18mm
Dispersion — 3.3nm/mm
Resolution — 0.5nm
EXCELLENT FOR
INSTRUMENTATION
APPLICATIONS

JA 82-410
Focal Length — 250mm
Focal Ratio — 3.5
Slit Length — 18 mm
Dispersion — 3.3nm/mm
and 1.6nm/mm
Resolution — 0.3nm
HIGHEST THRUPUT OF
ANY SMALL
MONOCHROMATOR



JA 82-410



JARRELL-ASH DIV. FISHER SCIENTIFIC CO.
590 LINCOLN ST., WALTHAM, MASS. 02154
617/890-4300

Circle No. 36 on Reader Service Card

umes 177 and 178, but at a price that only libraries could afford. The present one-volume paperback edition makes Flüge's work available to a much wider audience.

The subject matter of quantum mechanics is presented as a series of sections called "problems." Each problem is designed to answer a specific question formulated as a one-paragraph statement at the beginning of the section. This technique of exposition is most successful when applied to specific physical examples chosen from atomic, molecular and nuclear physics, particularly in areas to which Flüge himself has made contributions. In these cases, a reader with a reasonably substantial prior knowledge of basic quantum mechanics will see the theory applied in ways not usually described in most textbooks with the possible exception, in some cases, of Landau's and Lifshitz's two volumes. One has the feeling that Flüge is most interested in problems that have an exact mathematical solution; methods of approximation (particularly the various aspects of perturbation theory) are perhaps less strongly emphasized than one might expect of a book on applied quantum mechanics. What he stresses all along are methods, approaches, techniques, rather than basic ideas, and this is consistent with the objective of Flüge's book.

Unfortunately, the book suffers from a basic flaw that may affect its widespread use, namely the use (or misuse) of the English language. Perhaps the least troublesome aspect of the imperfections of Flüge's English are connected with choices of vocabulary: he frequently employs literal translations of German words not used in the same sense in English, or he substitutes for a standard expression a synonym that does not provoke the same mental association. Thus, first-order changes *stand in the first line*, particles are *included* between walls, signs are *inverted*, the configuration passes from *oblong* to *oblate* (instead of *prolate* to *oblate*), a Hamiltonian is *unrelativistic*, a beam has plane-wave *qualities* (instead of *properties*), particles are *equal* instead of *identical*, partial differential equations are *factorized* rather than *separated*, a discussion is *alleviated*, *dummies* are *exchanged* (meaning that dummy indices are interchanged), an exponential operator is *explained* by its power-series expansion, and the author has *fallen in with* the publisher's suggestion. In most cases, the author's meaning is nevertheless clear.

But what are we to make of a section entitled "Solutions Neighbouring Eigenfunctions," which makes no sense in English, but does in German where the adjective *benachbart* is put into its genitive declension, or of the expression

Soviet Physics DOKLADY

A translation of the physics sections of *Doklady Akademii Nauk SSSR*, the Proceedings of the USSR Academy of Sciences. All-science journal offering four-page reports of recent research in physics and borderline subjects.

Monthly. \$120 domestic, \$124 foreign.
\$126 optional air freight Europe
\$135 optional air freight Asia

Soviet Physics USPEKHI

A translation of *Uspekhi Fizicheskikh Nauk*. Offers reviews of recent developments comparable in scope and treatment to those carried in *Reviews of Modern Physics*. Also contains reports on scientific meetings within the Soviet Union, book reviews, and personalia.

Monthly. \$110 domestic, \$113 foreign.
\$114 optional air freight Europe
\$118 optional air freight Asia

Please address orders and inquiries to Marketing Services:

American Institute of Physics
335 East 45th Street
New York, N.Y. 10017

NEED MORE SPACE?

All AIP Published Journals
are available on Microfilm.

For a free microfilm catalog,
write to:

American Institute of Physics
Department BN
335 East 45th Street
New York, N.Y. 10017



"the muon orbital radius is running to about $\frac{1}{2}$ of it."? As a final example, consider the following sentence: "The relations hold for any linear combination of products consisting of an arbitrary number of p_k 's and x_k 's, i.e. for any integer functions in these variables, as had to be proved." What he meant to say is "that the relations hold for any linear combination of products of arbitrary integral powers of the p_k 's and x_k 's, as was to be proved."

An unfortunate consequence of Flügge's idiosyncratic use of English is a lack of clarity in the explanation of concepts that are employed in the solution of problems. It has been said in jest that the international language of science is broken English. Perhaps this medium of communication is less likely to lead to misunderstanding in verbal exchanges, where gestures and foreign words are available, than in a textbook or monograph. At any rate, Springer-Verlag should be urged to hire an English-speaking editor with a background in physics.

With the reservation just expressed, Flügge's book is a useful addition to the literature of applied quantum mechanics and should be of interest to graduate students at an intermediate level, and to many experimenters.

WOLFGANG FRANZEN
Boston University
Boston, Massachusetts

Modern Atomic Physics, Vol. 1: Fundamental Principles; Vol. 2: Quantum Theory and Its Applications

B. Cagnac, J.-C. Pebay-Peyroula
328 pp.; 253 pp. Halsted, New York, 1975.
\$16.95; \$17.95

Very few atomic physics texts are suitable for courses at the beginning graduate or final-year undergraduate level. This, however, is the level of the two-volume text *Modern Atomic Physics* by Bernard Cagnac and Jean-Claude Pebay-Peyroula, and it is a particular pleasure to see such a book published. The two volumes were initially the two volumes of *Physique Atomique*, by the same two authors, which are frequently used in French universities for a standard one-year course in atomic physics. The translation, by J. S. Deech of the University of Reading, is literal in the sense that the sentence structure is similar. However, the translator has very sensibly given himself the freedom to adjust the language to normal English usage. In all respects, the translation is admirable.

The two authors are well known for their research work in atomic physics:

Ealing

The Book is back!
and it's bigger
and better



Call or write for your FREE literature

The Ealing Corporation, 22 Pleasant Street
So. Natick, Mass. 01760. Tel: (617) 655-7000
Ealing Scientific Ltd. 9649 Côte de Liesse
Dorval H9P 1A3, Quebec • Ealing Beck Ltd.
Greycaine Road, Watford, WD2 4PW, England

Circle No. 37 on Reader Service Card

Ealing

new minibench



• useful for optical
subassemblies

Call or write for your FREE literature

The Ealing Corporation, 22 Pleasant Street
So. Natick, Mass. 01760. Tel: (617) 655-7000
Ealing Scientific Ltd. 9649 Côte de Liesse
Dorval H9P 1A3, Quebec • Ealing Beck Ltd.
Greycaine Road, Watford, WD2 4PW, England

Circle No. 38 on Reader Service Card