

meteorologists, geophysicists, and physicians have not cooperated and moreover spurious results have been hidden under statistical analyses. As causes of Slow Progress these are disappointingly familiar; all scientists have the usual problem of keeping many variables under control, and interdisciplinary cooperation is not easily achieved.

Biometeorology is the study of man in relation to climate. The author (he is not listed as editor) with 26 contributors has compiled an encyclopedic review of every phase of human medicine as affected by climate, ranging from town planning to space ships to cancer. It is documented by no less than 4400 references and includes the most tenuously associated ideas. The kind of material given is seen, for example, in the 15-page review of the effect of air ions on man, which is a difficult subject. The author does not state whether or not he believes the results reported. This is also true of the brief allusion to the possible effect of magnetic fields on living things.

Since the subject matter is interdisciplinary, the general reader will find something to his liking. One major section, called Important Physiological Processes in Man, is a concise review useful to scientists generally. The anecdotal summaries of many of the numerous technical papers cited also have a general appeal. Basically, however, the book is a reference text for medical practitioners and bioengineers. The excellent format makes it useful to have on hand.

**The Theory of Interacting Fermi Systems.** By P. Nozières. Transl. from French by D. Hone. 370 pp. Benjamin, New York, 1964. \$13.50.  
Reviewed by M. E. Rose, University of Virginia.

The development of methods for treating the many-body problem, as it appears in nuclear physics, solid-state physics, and plasma phenomena, is one of the brightest spots in the history of theoretical physics of recent years. As the author points out, this beautiful structure is the work of essentially the past decade. While rapid progress has been made, there are, no doubt, many unsolved problems. Despite this

fact, during the past five years, almost a dozen treatises on the subject have been published. This is presumably a manifestation of what may be called the "printing press explosion" which we have been witnessing during these past years. Nevertheless, a good book is always welcome and, on balance, this work of Dr. Nozières should be judged so. It is not an attempt to cover the broad spectrum of many-body theory but, as the title suggests, it is concerned solely with a class of many-body problems. The discussion of this class of problems is sufficiently general as to enable the reader to cope with problems outside the domain under consideration. The first two chapters are largely phenomenological in scope, being concerned with the Landau theory and with external excitations. From chapter three onward (that is, over eighty percent of the book), the Green's-function field-theoretic methods are the primary objects of discussion. The exposition is lucid, with emphasis on physical interpretation. Indeed, the author makes no claim to mathematical rigor. The chief objection, so far as this reviewer is concerned, is the intense preoccupation with formal theoretical development. The book is concerned with the question of how to calculate and not with the results of calculation. A search for specific results, with which experimental data are to be confronted, yields slim pickings.

**Le Signal du Sourcier.** By Y. Rocard. 1st ed., 136 pp., 1962; 2nd ed., 197 pp., 1964. Dunod, Paris, 20F.  
Reviewed by D. J. Montgomery, Michigan State University.

A scientist builds a rectangular coil, 0.5 meter by 1.0 meter, and sends a current through it to get a known magnetic field, 4 milligauss at the center. A meter or so away a detector tells him whether or not charge is flowing in the coil. You surely couldn't care less. Or could you? For the detector is a dowser, a human being equipped only with a divining rod, and the scientist is an established physicist, author of numerous articles and several books, director of an eminent laboratory, recipient of international honors.

Professor Rocard, professor of the Faculty of Sciences at the University of Paris, and director of the Laboratory of Physics at the Ecole Normale Supérieure, describes such an experiment. He assures us that the gift of dowsing is widely distributed. A good half of his students, for example, have managed to receive the message from the divining rod, he tells us in *Le Signal du Sourcier*, a title which I render less mellifluously as (*The Nature of*) *The Dowsers' Response*. (A note on derivations: Latin *surgere*, rise, led to Old French *sourdre*, spring forth, and thence to modern French *source*, well or spring, and *sourcier*, a person who finds a well; no matter what you might think, *sourcier* has no connection with modern French *sorcier*, which came from Latin *sors*, chance, allegedly by way of *sortarius*, diviner.)

In sum, Professor Rocard gives his evidence that a significant fraction of people can be trained to move in a magnetic field and by proper manipulation of a forked stick detect spatial inhomogeneities of the order of 1 milligauss per meter. These gradients are a hundred times greater than those commonly encountered in geomagnetic prospecting, and are comparable with those around an automobile or other such ferromagnetic mass. The connection with waterwitching is through the magnetic fields set up by electrofiltration currents, a phenomenon familiar to the physical chemist. The last link in the scientific chain, namely, identifying the detecting mechanism in the body, remains to be forged. Professor Rocard locates its site in the elbows, and wonders if nuclear magnetic resonance can be the physical basis.

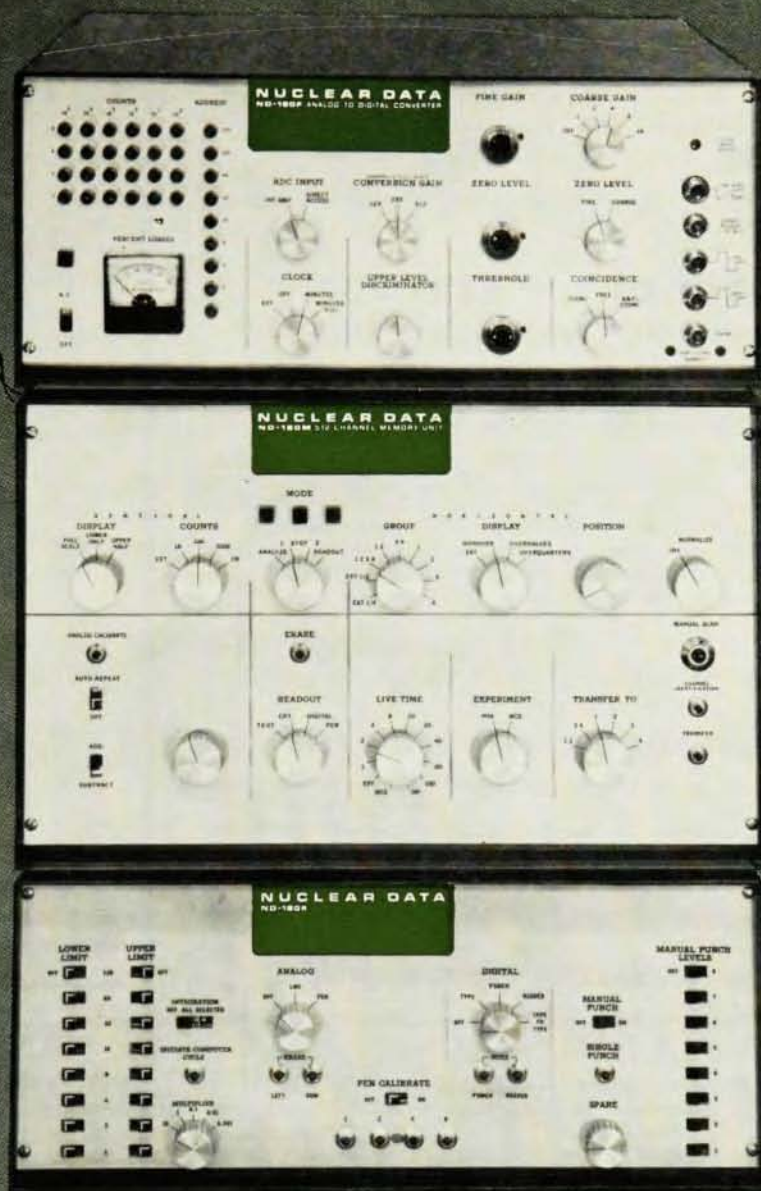
Nothing whatsoever of the occult exists in Rocard's approach. He is *not* talking about the Ouija board for recalling the departed, the divining rod in medical diagnosis, or the pendulum swung over aerial photographs to locate mineral deposits. He is simply looking for a physical explanation for the physiological action of the dowser in the field; he thinks it is magnetic. Anyone who has sought to establish the existence or nonexistence of biomagnetic effects knows



ND-180

# 512-Channel

Pulse Height Analyzer System with  
Signal-Averaging Programmer



## One analyzer system with all the features you've asked for!

*(plus one you didn't expect)*

Here's the system—analogue-to-digital converter, memory unit, and readout control unit—that has everything important, everything you've asked us to provide in a pulse height analyzer system. The system provides live display, spectrum stripping and integrating capabilities, as well as off-line, tape-to-typewriter conversion, log display, manual entry to tape, high-

speed printer, and many other functions.

Here's the bonus! This system also has the capacity for signal averaging with a multiscaling programmer. The result is an analyzer that also extracts the signal of interest from non-filterable noise by enhancing the signal-to-noise ratio.

In this space, we can't cover all the features you'll find interesting. For com-

plete information on ND-180 Pulse Height Analyzer System, contact your Nuclear Data Salesman, or write for details on ND-180—one analyzer with all the features you've asked for.

**As you'd expect, it's from Nuclear Data**

**Nuclear Data, Inc.**

P. O. Box 451, 100 W. Golf Rd., Palatine, Illinois 60067

ND-181 1024-Channel Analyzer System also available.





## INTERNATIONAL ATOMIC ENERGY AGENCY

IAEA Kärntner Ring 11, Vienna I, Austria

### BOOKS ON REACTOR PHYSICS AND REACTORS

#### EXPONENTIAL AND CRITICAL EXPERIMENTS

Proceedings of an IAEA symposium held in Amsterdam, September 1963. Contents: (Vol. I) The general role of critical and exponential experiments; Fast assemblies; Subcritical  $H_2O$  assemblies. (Vol. II) Subcritical water assemblies— $H_2O$  or  $D_2O$ ; Water assemblies— $H_2O$  and/or  $D_2O$ ;  $D_2O$  assemblies. (Vol. III) Assemblies with graphite; Special theoretical and experimental techniques; Organic-moderated or cooled assemblies.

(1964) Vol. I: 480 pp, \$10.00  
Vol. II: 610 pp, \$12.00 Vol. III: 482 pp, \$10.00

#### OPERATING EXPERIENCE WITH POWER REACTORS

Proceedings of an IAEA conference held in Vienna, June 1963. Papers by representatives of all the nuclear-power producing countries on the five principal types of power reactors: pressurized water, heavy water, boiling water, gas-cooled, fast.

(1963) Vol. I: 526 pp, \$10.00 Vol. II: 412 pp, \$8.50

#### RADIATION DAMAGE IN REACTOR MATERIALS

Part of the proceedings of the Symposium on Radiation Damage in Solids and Reactor Materials, Venice, May 1962. Contents: Radiation Damage in Fissionable Metals; in Ceramic Nuclear Fuel; in Graphite; in Beryllium Oxide.

(1963) 762 pp \$15.00

#### PHYSICS OF FAST AND INTERMEDIATE REACTORS

Proceedings of a seminar held in Vienna, August 1961. Contents: (Vol. I) Neutron physics, Integral experiments; (Vol. II) Reactor theory; (Vol. III) Reactor dynamics, Physics of specific reactors.

(1962) Vol. I: 487 pp, \$9.00  
Vol. II: 407 pp, \$9.00 Vol. III: 619 pp, \$12.00

#### HEAVY WATER LATTICES—SECOND PANEL REPORT

The report of a panel that met in Vienna, February 1963, as part of a continuing IAEA program of reactor-physics panels. Contents: General summary, status reports, summaries of discussions, and supporting papers.

(1963) 648 pp \$13.00

*A catalog of IAEA publications will be sent on request.*

In the USA order from:

**NATIONAL AGENCY FOR  
INTERNATIONAL PUBLICATIONS, INC.**

317 East 34th Street, New York, N.Y. 10016

## THE NATURAL RADIATION ENVIRONMENT

*Edited by John A. S. Adams  
and Wayne M. Lowder*

Over one hundred scientists have contributed the results of their research on methods of detection, the "natural fallout," the radioactivity of rocks, soils, and waters, the cosmic ray neutron flux, and many other related topics. Provides essential background information for scientists concerned with the effects of ionizing radiation on man. A volume in the *Rice University Semicentennial Series*. \$15.00



**THE UNIVERSITY OF CHICAGO PRESS**  
5750 Ellis Avenue, Chicago, Illinois 60637



### METAL AND ALLOY SINGLE CRYSTALS

**Available for Immediate Delivery  
or Prepared to Specifications  
For**

Fermi Surface Studies  
Magnetic Studies  
Epitaxial Studies  
Surface Chemistry Investigations  
Neutron Monochromators  
Solid State Studies  
Spheres as Corrosion Detectors  
Potential Use as High Vacuum Gaskets

*write for list*

### RESEARCH CRYSTALS

P. O. Box 8512  
RICHMOND, VIRGINIA 23226



how futile it is trying to change opinions in either direction, and will hardly expect Professor Rocard to fare any better.

Be that as it may, Rocard has given a definite and detailed prescription for a test (pp. 67-76, 2nd ed.), the first objective one ever proposed for dowsing. Whosoever feels called upon to deny the effect may repeat the test, and let us have his results. In the meantime the message from *Le Signal du Sourcier* is clear. In Anglo-Saxon monosyllables it is: put up or shut up.

**Kleines Lehrbuch der Physik.** (5th Ed.) Ohne Anwendung höherer Mathematik. By William H. Westphal. 265 pp. Springer-Verlag, Berlin, 1963. DM 18. Reviewed by Walter G. Mayer, Michigan State University.

There is one problem which confronts the teaching communities of many

countries: how to present physics to the student who "does not master the basic elements of higher mathematics and is terrified by a simple derivative". Professor Westphal set out to attempt a solution and, as far as the German-speaking student is concerned, he appears to have been rather successful since his little textbook has seen five editions in the last fifteen years.

The "little textbook" deals primarily with classical physics. The first two chapters discuss mechanics, the next section is on heat, followed by two chapters on electricity and magnetism. One section deals with optics and general radiation phenomena, and the last chapter is simply entitled "Atoms".

It would be incorrect to say that the author has tried to give the reader a sense of security by avoiding topics which may be difficult to understand. He only avoids calculus—but

makes extensive use of formulas, frequently in such a manner that it is the formula which proves the point and not a lengthy description. There are no numerical examples, nor are there any exercises. The book lists facts and laws.

Since this book is frequently used by students of medicine and biology, it is encouraging that the new edition includes an improved section on x rays. This particular group of readers may also have profited from a somewhat enlarged discussion of nuclear and radiation physics. Although many aspects of modern physics are described, it appears as if these topics received a little less attention than the thorough treatment of classical physics. Nevertheless, the reader should find this book to be a good, noncalculus, well-illustrated introduction which contains a great deal of basic physics.

## BOOKS RECEIVED

### ACOUSTICS

**A Course of Lectures on The Theory of Sound.** By S. N. Rschevkin, Transl. from Russian by O. M. Blunn. Translation edited by P. E. Doak. 464 pp. (Pergamon, Oxford) Macmillan, New York, 1963. \$12.50.

### ASTRONOMY & ASTROPHYSICS

**The Universe of Time and Space.** A Course of Selected Lectures in Astronomy, Cosmology and Physics. S. T. Butler and H. Messel, eds. 291 pp. (Pergamon, Oxford) Macmillan, New York, 1964. Paper \$2.95.

**Observations during The Eclipse of February 1961.** (Sixth AGARD Ionospheric Research Committee Meeting, Naples, May 15-20, 1961). Luciano de Socio, ed. 53 pp. (Pergamon, Oxford) Macmillan, New York, 1964. Paper \$3.75.

**Habitable Planets for Man.** By Stephen H. Dole. 158 pp. Blaisdell, New York, 1964. \$5.75.

### ATOMIC & MOLECULAR PHYSICS

**Soviet Maser Research.** D. V. Skobel'tsyn, ed. Transl. from Russian. 186 pp. Consultants Bureau, New York, 1964. Paper \$27.50.

**The Structure of Atoms.** By Verne H. Booth. 204 pp. Macmillan, New York, 1964. Paper \$2.95.

**Masers and Lasers. How They Work, What They Do.** By M. Brotherton. 207 pp. McGraw-Hill, New York, 1964. \$8.50.

### BIOPHYSICS & MEDICAL PHYSICS

**Progress in Biophysics and Molecular Biology, Volume 13.** J. A. V. Butler, H. E. Huxley, and R. E. Zirkle, eds. 328 pp. (Pergamon, Oxford) Macmillan, New York, 1963. \$12.75.

**Personnel Dosimetry Techniques for External Radiation.** Their Application in Nuclear Installations. Symp. Proc. (Madrid, April 1963) 510 pp. European Nuclear Energy Agency, Paris, 1963. Paper \$8.00.

**The Toxicology of Radioactive Substances.** Vol. 2, Radioactive Cobalt, Sodium, Phosphorus, and Gold. A. A. Letavet and E. B. Kurlyandskaya, eds. Transl. from Russian by R. E. Travers. (Pergamon, Oxford) Macmillan, New York, 1963. \$12.50.

**Radiation Hazards and Protection.** By D. E. Barnes and D. Taylor. 221 pp. Pitman Publishing Co., New York, 1963. \$8.50.

**Advances in Biological and Medical Physics, Volume 9.** John H. Lawrence, John W. Gofman, and Thomas L. Hayes, eds. 496 pp. Academic, New York, 1963. \$16.00.

### CHEMISTRY & CHEMICAL PHYSICS

**Physical Chemistry.** By A. J. Mee and J. C. Speakman. 719 pp. Aldine, Chicago, 1964. \$5.95.

**Advances in Chemical Engineering, Volume 4.** Thomas B. Drew, John W. Hoopes, Jr., and Theodore Vermeulen, eds. 374 pp. Academic, New York, 1964. \$14.00.

**Classical Thermodynamics of Non-Electrolyte Solutions.** By H. C. Van Ness. 166 pp. (Pergamon, Oxford) Macmillan, New York, 1964. \$6.00.

**Electronic Charges of Bonds in Organic Compounds.** By G. V. Bykov. Transl. from Russian by J. T. Greaves. 191 pp. (Pergamon, Oxford) Macmillan, New York, 1964. \$9.00.

**The Stabilization of Polyvinyl Chloride.** By Fernand Chevassus and Roger de Broutelles. Transl. from French by C. John R. Eichhorn and Esteban E. Sarmiento. 385 pp. St. Martin's Press, New York, 1964. \$16.00.