



some halting steps toward the development of a theory of culture. Despite obvious substantive differences in science, art, literature and other components of culture, Crane feels that there are sufficient similarities in their "modes of social and ideational development" to merit looking at all of them from the same theoretical perspective. The key for Crane is that all are characterized by "cumulative growth punctuated by periodic discontinuities."

Interesting and provocative as these ideas may be, they are, to my mind at least, somewhat premature. Nothing in this volume convinces me that we already know enough about the sociology of science—even in the limited way in which she has defined it. Whether developing a general sociology of culture is more likely to accelerate or enhance our understanding of science in its own right also remains to be seen.

But these are issues best elaborated in sociological communities, invisible colleges and "circles." Many physicists may find this book of interest—particularly much of the discussion in chapter 6 on some of the conditions facilitating the transmission of ideas especially in the interaction between scientific communities.

NORMAN KAPLAN
Northeastern University

Introduction to Particle Physics

Roland Omnès; G. Barton, trans.
414 pp. Interscience, New York, 1971.
\$18.50

In a currently developing field such as particle physics the problems of a textbook writer are perennial. Ideally he

must present the established material that lays the foundation for a student's study and also give an account of current activity that indicates new directions in the subject. Some authors concentrate on the former task and present an encyclopedic survey of standard material, and leave the newer developments to conference proceedings and to journals.

In his book, *Introduction to Particle Physics*, Roland Omnès seeks to cover both the established and the current. He does this by dividing the text into two distinct parts and by aiming at a deliberate contrast between the topics treated in each. Part I he calls the "grammar" of the subject, and Part II the "guide to the literature."

Thus Part I begins with a broad survey at a level that includes sketches of a cyclotron, synchrotron, linear accelerator, and a bubble chamber and goes on to topics such as conservation laws, group theory, collision theory, and resonances. A good many matrices are written out explicitly (a factor that seems to have become a measure of the sophistication of a work). The treatment in this section is largely pedagogical and generally elementary. On the other hand, chapters 4 and 10 constitute a far more advanced discussion of relativistic kinematics using the Poincaré group and the derivation of the Dirac equation from this point of view.

The introduction to Part II promises to "present a relatively complete panoramic view of the many different aspects of particle physics, and to be deliberately superficial..." The topics covered are quantum electrodynamics, strong interactions, SU(3), Regge poles and weak interactions. As usual, such a survey is inevitably biased toward the author's own interests, and Omnès, who is co-author of *Mandelstam Theory and Regge Poles*, is no exception.

The division into parts I and II is

a new North-Holland journal

Chemical Physics

A journal devoted to the experimental and theoretical research involving problems of both a chemical and a physical nature

Board of Editors:

G. L. HOFACKER, *München*
G. WILSE ROBINSON, *Pasadena*
E. W. SCHLAG, *München*

The Board of Editors is assisted by an International Advisory Editorial Board of ca. 40 leading scientists.

The journal will publish experimental and theoretical papers on all aspects of Chemical Physics.

Volumes 1 and 2 are scheduled to appear in 1973. The total subscription price for Volumes 1 and 2 will be Dfl. 220.00 (ca. US\$70.00).

other prominent North-Holland journals

Chemical Physics Letters

1973: Volumes 17-22
Subscription price: Dfl. 726.00 (ca. US\$ 230.00)

Journal of Crystal Growth

1973: Volumes 17-22
Subscription price: Dfl. 500.00 (ca. US\$ 160.00)

Journal of Luminescence

1973: Volumes 6-8
Subscription price: Dfl. 303.00 (ca. US\$ 95.00)

Journal of Non-Crystalline Solids

1973: Volumes 12-13
Subscription price: Dfl. 194.00 (ca. US\$ 62.00)

Physica

1973: Volumes 63-70
Subscription price: Dfl. 648.00 (ca. US\$ 205.00)

Physics, Letters, including

Section A, 1973: Volumes 42-46
Section B, 1973: Volumes 42-48
Subscription price: Dfl. 924.00 (ca. US\$ 295.00)

Physics Reports

1973: Volumes 6-11
Subscription price: Dfl. 462.00 (ca. US\$ 150.00)

SPECIAL OFFER:

Subscribers to Physics Letters A, Vols. 42-46 and Physics Letters B, Vols. 42-48 are entitled to order Physics Reports, Vols. 6-11 at the reduced price of Dfl. 342.00. The full subscription price to Physics Letters A, B and Physics Reports is Dfl. 1266.00 (ca. US\$ 405.00).

Research Policy

1973: Volume 2
Subscription price: Dfl. 92.00 (ca. US\$ 30.00)

Surface Science

1973: Volumes 34-39
Subscription price: Dfl. 756.00 (ca. US\$ 240.00)

All prices include postage and handling costs
Specimen copies of all journals are available on request

NORTH HOLLAND

P.O. Box 211 — Amsterdam — The Netherlands
Circle No. 45 on Reader Service Card

Saunders texts can mean the difference between taking physics and learning it.

Highsmith & Howard: **ADVENTURES IN PHYSICS**

By Phillip E. Highsmith and Andrew S. Howard, both of Converse College.

Extensively uses graphical analysis. Designed for the one-quarter or one-semester course offered to non-science majors

Introductory physics for non-science majors takes on a new look with Highsmith & Howard's *Adventures In Physics*. Graphical analysis is used as the mathematical tool to help students understand physical concepts and solve problems. This approach allows the authors to provide relatively rigorous explanations of the material—without losing the student whose only mathematical background is high school algebra. However, as complete as the authors' explanations are, they are not so long as to frighten the student; in addition, the authors always keep the application of physical concepts in the foreground. They fully consider that the student's primary interests lie outside the field of physics.

272 pages, 251 illustrations. \$9.50. Published March, 1972. Order Code 4660.

ADVENTURES IN PHYSICS LABORATORY MANUAL

Parallels the development of topics in the text

Also for the one-quarter or one-semester course, Professors Highsmith and Howard offer a well-organized laboratory manual to accompany their text. Experiments parallel the development of topics in the text and follow through with extensive use of graphical analysis.

141 pages, illustrated. Soft Cover. \$4.50. Published March, 1972. Order Code 4664.

Marion & Davidson: *Volume I:* **MATHEMATICAL PREPARATION FOR GENERAL PHYSICS**

By Jerry B. Marion and Ronald C. Davidson, both of University of Maryland.

For physics students having difficulty handling basic mathematical tools

This inexpensive, soft-cover text can help any student whose difficulty with introductory physics stems from his lack of familiarity with basic mathematical tools. It can help him build manipulative skill without using valuable classroom time. The authors offer a short, concise overview of all the mathematical topics normally encountered in an introductory course. In every instance the authors are concerned with operational techniques—not rigor.

230 pages, illustrated. Soft Cover. \$4.75. Published February, 1972. Order Code 6070.

Davidson & Marion: *Volume II:* **MATHEMATICAL PREPARATION FOR GENERAL PHYSICS WITH CALCULUS**

New

For general physics courses with calculus

Here, as before, the authors offer a concise overview of all the mathematical topics normally encountered in an introductory course in general physics, *but now add coverage of calculus*. They discuss differential and integral calculus, exponential functions, natural (as well as common) logarithms, log-log plots, semilog plots, vectors that change with time, etc. Frequent use of worked examples helps to clarify each discussion. In addition, numerous problems are provided so that the student can continually test his understanding of each new idea and technique.

About 290 pages, 105 illustrations. Soft Cover. About \$4.75. Ready March, 1973. Order Code 2918.

Smith & Jacobs: **INTRODUCTORY ASTRONOMY AND ASTROPHYSICS**

By Elske v. P. Smith, Univ. of Maryland, and Kenneth C. Jacobs, Univ. of Virginia

**For the year-long course or one-semester exposure—
a new introductory text for serious physical science majors**

Earth, solar system, stellar astronomy, home galaxy, cosmology—here is a clearly written new text in astronomy and astrophysics geared to freshmen and sophomores with a solid grounding in high school geometry, algebra and trigonometry. Drs. Smith and Jacobs emphasize modern astronomy and elementary astrophysics without neglecting the heritage of classical astronomy. From atomic theory to cosmogony, from stellar evolution to quasars, students will find a complete, well-balanced storehouse of information in this text.

About 500 pages, 300 illustrations. Ready April 1973. Order Code 8387.

Diefenderfer: **PRINCIPLES OF ELECTRONIC INSTRUMENTATION**

By A. James Diefenderfer, Lehigh University

An introduction to electronics highlighted by 750 illustrations

Discussing subjects ranging from the rudiments of ac and dc theory to the principles of circuit design, Professor Diefenderfer provides an easy-to-understand introduction to electronic instrumentation for students enrolled in a one-semester course. No prior knowledge of electronics is assumed. The principles behind the operation of semiconductors and transducers are fully developed. Throughout the text practical results and applications are emphasized. A laboratory manual, *Basic Techniques In Electronic Instrumentation*, is also offered.

Text: 675 pages, 750 illustrations. \$14.95. Order Code 3075. Manual: 375 pages, 257 illustrations. Soft Cover. \$7.50. Order Code 3072. Both Published April, 1972.

Anderson:

MODERN PHYSICS AND QUANTUM MECHANICS

By Elmer E. Anderson, Clarkson College of Technology

An elementary but rigorous approach

Now junior/senior physics majors can more easily bridge the gap between descriptive introductory physics and graduate-level quantum mechanics. Dr. Anderson introduces operator methods—at a level comprehensible to his audience—and also discusses use of four vectors in relativity, the Fourier integral theorem, the delta function, and the polynomial solution of the harmonic oscillator.

430 pages, 106 illustrations. \$14.50. Published May, 1971. Order Code 1220.

Blakemore:

SOLID STATE PHYSICS

By John S. Blakemore, Florida Atlantic Univ.

Designed for the one-semester senior-level course

An ideal text for students majoring in physics, electrical engineering or materials science. Dr. Blakemore emphasizes the consequences of the periodic lattice structure of a crystalline solid in determining the electronic energy structure and the allowed forms of lattice vibrations. Also discussed are the band theory of solids, Fermi surface topology in metals, and free carriers in semi-conductors.

391 pages, 230 illustrations. \$13.50. Published May, 1969. Order Code 1700.

W. B. SAUNDERS COMPANY West Washington Square, Philadelphia, Pa. 19105

Please send me

☐ for adoption consideration

☐ for my personal library (less academic discount)

Title of Book Requested

Order Code

Title of Course

Present Text

_____ Physics Today 1/73

Name _____ School _____

Address _____ ZIP _____

From HARPER & ROW

Essentials of Modern Physics

VIRGILIO ACOSTA,
B. J. GRAHAM, and
CLYDE L. COWAN

A lucid approach to the principles of relativity, particle and wave behavior of matter, introductory quantum mechanics, atomic structure, nuclear structure, the solid state, elementary particles, and cosmology. Short "student-sized" chapters focus on specific topics instead of general areas. Treatment of quantum mechanics is unusually complete. Elementary particles are examined utilizing the latest concepts. February, 1973. Tentative: 512 pp.; \$11.95. *Answer Book*.

Physics

Volume I: Mechanics and Heat

Volume II: Electricity, Magnetism
and Optics

Volume III: Modern Physics

ARNOLD L. REIMANN

Written for the student interested in learning not merely *what* we know about physics, but *how* we know it, and how we understand and appreciate the methods by which scientific knowledge is acquired. The first two volumes in this three-volume series are comprehensive introductions for science majors and engineering students. Volume III is ideally suited as a continuation of its preceding series companions, but is also designed for independent use in modern physics courses. Volume I: 1971; 478 pp.; \$6.50. Volume II: 1971; 569 pp.; \$6.50. Volume III: Spring, 1973; 525 pp. (tentative); \$6.50 (tentative). Volumes I and II are also available in a combined edition: 1971; 1,047 pp.; \$10.95. Paper. *Solutions Manual* available to accompany Volume I and the Combined Edition.

Nobel Prize-winner

LEON N. COOPER's

An Introduction to the Meaning and Structure of Physics

The Original Edition: Especially written for nonscience majors, this text does not require calculus. All the classical topics (mechanics, heat, light, electricity, magnetism) are examined before modern physics is introduced. Generalizations and abstractions of more advanced concepts follow. This approach integrates fundamental ideas of physics within the setting of their historical development. 1968. 748 pp.; \$13.95.

The Short Edition: Abridged and slightly revised, the Short Edition covers nearly all the same topics but excludes some of the more technical illustrations and simplifies more difficult parts of the exposition. 1970. 535 pp.; \$12.95.



Harper & Row
10 East 53d Street
New York 10022

1817

Circle No. 46 on Reader Service Card

novel, but perhaps a bit artificial and forced; the treatment in both parts is uneven in level and thoroughness, and specific topics could have been placed as well in either part. The book was completed in early 1969; thus current algebra is treated in only a page and a half of small print, and there is no discussion of scale invariance or related high-energy problems.

There are useful exercises with each chapter, and, in the back, a very interesting chronology of particle physics from 1911 to 1968. The layout, print, and paper of the volume are exceedingly pleasant and conducive to study.

This work has been translated from the French by G. Barton (author of *An Introduction to Advanced Field Theory* and *Dispersion Techniques in Field Theory*). Like many translations, the text exhibits a certain inelegance and stiffness in style, and contains a number of misspellings. Certain mathematical expressions, such as "rot," "sh" and "ch" are left in European form. These features may be a drawback to the avowed pedagogical aim of the book.

This book is intended as an elementary introduction to particle theory for first-year graduate students, and has little interest for advanced workers. Supplemented by more thorough treatments of the material in Part II, it forms an accessible nucleus for a first course in particle physics, and I personally am likely to use it in my own teaching in this way.

R. A. URITAM
Boston College

Applications of Green's Functions in Science and Engineering

M. D. Greenberg

141 pp. Prentice-Hall,
Englewood Cliffs, N. J., 1971.
\$6.95

M. D. Greenberg, a member of the department of mechanical and aerospace engineering at the University of Delaware, opens this text book with the statement: "It is often felt that the Green's function method is too sophisticated to be widely available to engineers and scientists." Rejecting this premise (in which I see at least a grain of truth, but which Greenberg evidently offers as a straw man), he goes on to develop a self-contained treatment of Green's functions that "should be suitable either for advanced undergraduates or graduate students ... with only a modest background ... in ordinary and partial differential equations." I surmise, although the author

does not explicitly state, that the book is intended either for a short course devoted primarily to Green's functions or as collateral reading for a longer course on methods of mathematical physics. It is significantly below the level of Arnold Sommerfeld's classic *Partial Differential Equations in Physics* (Academic, 1949) and, at least in its choice of examples, appears to be directed rather more to engineers than to physicists.

Part I is devoted to ordinary differential equations and develops such basic concepts as the adjoint operator and the delta function. The latter is introduced in the usual, heuristic manner, starting from the concept of a concentrated load, after which there is a brief discussion of generalized functions and limit sequences. The development of one-dimensional Green's functions is restricted to quite simple examples, but the author states that, even though he may appear to be "cracking peanuts with a sledgehammer, ... an understanding of these examples will leave the reader in a position to deal with more complicated applications." In fact, the treatment is so elementary that I was unable to find such an important result as the general construction of $G(x, \xi)$ for a second-order differential equation in terms of a given pair of linearly independent solutions of that equation; nor could I find the statement that the discontinuity in dG/dx at $x = \xi$ is equal to $1/p(x)$, where p is defined by the self-adjoint form of the differential equation, $(py')' + \dots$.

Part I closes with a brief discussion of the eigenfunction method and Sturm-Liouville theory. This discussion serves to illustrate some of the difficulties that may arise when a particular problem admits an eigensolution; it also serves to suggest that a more thorough grounding in eigenfunction theory is a necessary condition for a proper understanding of the Green's-function technique (see above).

Part II is devoted to partial differential equations. It begins with the formal classification of a linear, second-order equation through the sign of its discriminant, but without any reference to characteristics (which are not mentioned even in connection with D'Alembert's solution of the wave equation or in the discussion of domains of influence and dependence). Green's functions for the Laplace, Helmholtz, and diffusion equations in two dimensions and the wave equation in one dimension are developed in some detail, after which additional examples are treated more briefly. The relation between the eigenfunction and Green's-function methods is illustrated by solving Poisson's equation for a rectangle.

On the whole, this book is clear and