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By George Shortley and Dudley Williams.  
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By Robert T. Dixon, Riverside City College, Riverside, California.  
DYNAMIC ASTRONOMY is directed primarily to the liberal arts student and to the general science reader in the field of astronomy. Presuming no previous training in science, the author presents a logical core of important concepts of basic astronomy upon which the instructor can elaborate. Spring 1971, approx. 416pp, \$11.95 (22121-8)

### THE PHYSICAL SCIENCES, Fifth Edition

By Cable, Getchell, Kadesh, Poppy and Wilson.  
STUDY GUIDE FOR THE PHYSICAL SCIENCES, By Willard J. Poppy and Leland L. Wilson, University of Northern Iowa  
THE PHYSICAL SCIENCES, Fifth Edition, examines the major ideas of physics, chemistry, meteorology, geology, and astronomy for the non-technical student. Poppy and Wilson provide a new study guide to accompany the text, which furnishes: a chapter summary, a list of important terms; questions; experimental investigations, and sets of data for analysis. Text: 1969, 577pp, \$10.95 (67178-4) Study Guide: December 1970, 192pp, \$2.95 (67177-6)

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By Vladimir Rojansky, Harvey Mudd College.  
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discussion includes, in great detail, the Born approximation as applied to elastic and inelastic scattering and the analytic theory (for example, generalized variational method and distorted wave method) for slow collisions. As in the first part, the main emphasis is on the comparison of theory with experimental results. Recently discovered resonance phenomena and threshold behavior have also received fair treatment.

Volume 2 deals with the collision of electrons with molecules and photoionization, and treats almost all facets of the electron-molecule collision. These facets include elastic scattering, rotational and vibrational excitation, electronic excitation, ionization and attachment. Reference is made to specific molecules ( $H_2$ ,  $O_2$ ,  $N_2$ ,  $CO$ ,  $CO_2$ ,  $H_2O$ ) which makes the book very useful for those interested in practical applications of the data.

The section on photoionization also includes negative ions and radiative attachment and photo detachment. These processes play an important role in the lower D region of the ionosphere and, therefore, their inclusion greatly adds to the book's utility.

The level of the theoretical treatment is very practical minded. Thus it places this tends to be nonrigorous and may not completely satisfy a serious modern theorist. But, because of this approach, the two volumes will be very welcome to a large cross section of readers.

SHEO S. PRASAD  
*University of Florida*

### Introduction to University Physics, Vol. 2

By J. Magan

972 pp. Allyn and Bacon, Boston, Mass., 1969.

Introductory books to university physics are now almost legions in number. Almost each university has its own textbook, written by one or more members of the physics faculty. Slowly the time is coming, when an International Association of Physics Introductory Text Writers (IAPITW) will be formed.

Joseph Magan's textbook is intended for an introductory course for college and university students majoring in science and engineering. The contents follow the classical pattern. Part one presents mechanics, heat, wave motion and sound. In the first paragraph the philosophy of physical methods is very well introduced, and the notions of vector additions and subtractions are helpful for the students. It is a pity that a college physics course can not generally use the simple calculus. I hope the present generation will still be alive when basic calculus is among the stan-

dard requirements of high schools. Magan's double-column parallel calculus and noncalculus treatments in some parts are therefore very handy.

Certainly a physics student must be able to work in any system of units. Therefore Magan employs throughout the cgs absolute, the mks absolute and the English gravitational system. Maybe for students not majoring in physics this could sometimes be too difficult, at least this is my experience. Each chapter mentions modern applications, which correspond of course to the author's temperament and taste.

The second volume is devoted to electricity and magnetism and geometrical and physical optics. Spectroscopy and nuclear phenomena represent the dessert in the last 54 pages. Even for an introductory course, Magan's treatments of semiconductors, relativity, superconductivity are to my taste too short. Why not include in the next edition also a little bit more on elementary-particle physics, because so many exciting things are going on there?

Magan's book is certainly well written and would be a very good help for freshmen and sophomores. The book can be recommended to all teachers who like the classical way into the royaume of physics.

EDGAR LÜSCHER

*Technischen Hochschule München*

## Physics: Its Structure and Evolution

By W. A. Blanpied

950 pp. Blaisdell, Waltham, Mass., 1969. \$13.50

Physics texts will, we hope, stimulate students to an interest in a fascinating modern science, its methods and some of its current topics. I feel that this is such a book. Although it is designed to be used in a liberal-arts course, it should also be considered by those looking for a text for science students. The author's intention is to "present physics from a physicist's point of view" and this comes across well.

Although the usual range of topics is included, some (such as ray optics and simple circuits) receive only a brief treatment. This leaves room for those areas where the concepts are not always easy for freshmen to grasp.

There is a full chapter on symmetry principles and conservation laws—a good example of modern thinking and worth the effort that will be required. The chapter on conservation of energy is good, with a broad sweep. I liked the idea of grouping in one chapter several topics in classical probability and statistics in physics. The final chapters appear a bit breathless, but are still good in showing the great range of ap-

plication of physical ideas, from nuclear physics through some discussion of fundamental particles, chemical ideas and stellar evolution.

Each chapter has a good selection of suggested readings; there is the usual number of problems and, where appropriate, more detailed mathematical derivations to supplement the main text.

It is very hard to judge a text without actually using it in class, and many of the criteria usually adopted are very personal. However, this book appears to be very attractive, and I shall probably want to try it with my next course.

M. W. FRIEDLANDER  
*Washington University*

## Aristotle's Physics

H. G. Apostle, trans.

386 pp. Indiana U. P., Bloomington, Ind., 1969. Cloth \$12.50, paper \$3.95

The modern physicist who picks up a copy of Aristotle's *Physics* will find himself in very unfamiliar territory. It is not simply that Aristotle has given erroneous or elementary answers to familiar questions: The very questions are unfamiliar.

For one thing, physics, as conceived by Aristotle, is much broader than modern physics. Aristotle's physics is the science of nature; its aim is to formulate general principles for dealing with all natural bodies—organic as well as inorganic—having within themselves a principle of change or movement. Moreover, Aristotle expressly divorces physics from mathematics. Physics is concerned with change, whereas mathematics abstracts certain unchangeable aspects from bodies and considers them as though they existed apart from matter and the world of change.

The sort of principle developed by Aristotle to deal with natural bodies is illustrated in his analysis of motion, which dominates the *Physics*. Motion, by which Aristotle means change in general, always occurs between two opposites—such as hot and cold or white and black—which Aristotle calls "form" and "privation." There must also be something to undergo change (the "substratum" or "matter"), a purpose or end towards which the change is directed and an agent or instrument directly responsible for the change. Now to understand motion is to comprehend all of these factors, which Aristotle denominates, respectively, the formal cause, material cause, final cause and efficient cause. Aristotle goes on to discuss the infinite, place, void, time, contrariety and so forth, but enough has been said to demonstrate the chasm separating Aristotelian analysis of motion from that of Newtonian and more recent physics.

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## TOPICS IN PLASMA DIAGNOSTICS

By I. M. Podgornyi, Institute of Cosmic Studies, Moscow, USSR

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*Translated from Russian.*

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Edited by A. W. Czanderna, Clarkson College of Technology, Potsdam, N.Y.

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