

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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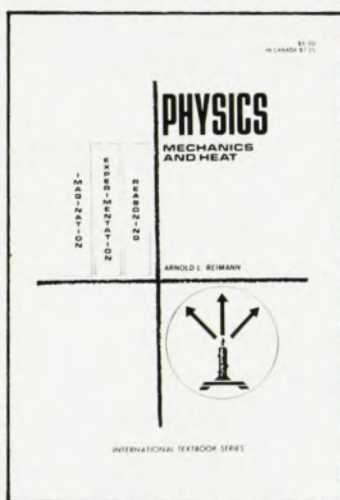
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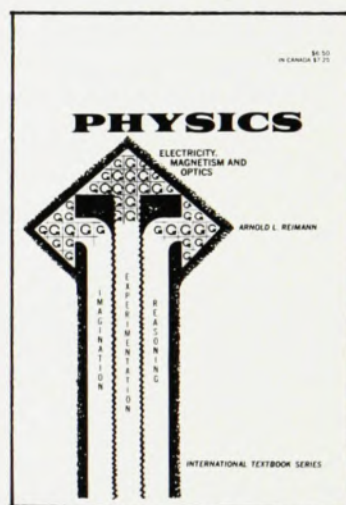
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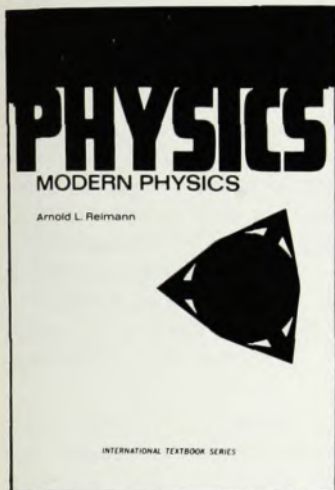
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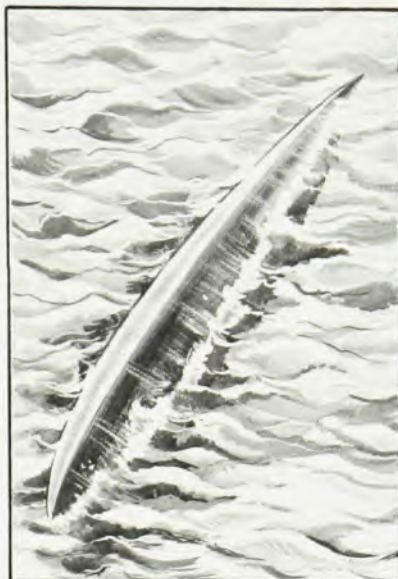
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One very obvious question calls for an answer: Is there any reason why physicists should pay attention to Aristotle and his system of physics? Or to put it more bluntly, should a new translation of Aristotle's *Physics* be reviewed for any purpose other than warning physicists not to waste their time on it? Without making a general plea for study of the history of science, may I simply point out that to understand fully what it means to be committed to the world view of modern physics, it is required that one understand what it means to be committed to an alternative world view. Hippocrates G. Apostle, in his excellent translation (accompanied, I must add, by useful notes and a glossary of terms), has made available the most influential of all the alternatives—namely, the one that dominated western thought for some 2000 years.

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University of Wisconsin

Theoretical And Experimental Biophysics, Vol. 2

Arthur Cole, ed.

343 pp. Marcel Dekker, New York, 1969.
\$17.75

The field of biophysics is certainly large enough and important enough to accommodate scientists with a broad range of interests. In an interdisciplinary field such as this, it is often difficult to determine where one begins and another ends. However, it would seem possible to sort out the basic disciplines.

The content of this book contributes very little to the understanding of the physics of biological systems. It is definitely slanted towards chemical processes and their role in living systems, which is in contrast to other treatises on the same subject. At best, its main chapters might be classified as physical chemistry or the applications of engineering thermodynamics to biological systems.

The book has five chapters containing almost pure chemistry or technique. Again, does the use of a physical technique make the subject matter physics? I think not. The chapters on membranes and relaxation methods appear to me to be pure biochemistry. Although physical methods are described and have provided much of the data discussed, interpretation is made almost entirely from a chemical point of view. A third chapter on chemiosmotic coupling and energy transduction covers the application of well known thermodynamical principles to biochemical systems. The final two chapters cover the