

BOOKS

THE GROWTH OF SCIENTIFIC IDEAS

by William P. D. Wightman

Yale University Press,
New Haven, \$5.00

*Reviewed by Charles E. Bures
Assistant Professor of Philosophy
and Psychology*

DR. WIGHTMAN is the first holder of a new Lectureship in the History and Philosophy of Science at the University of Aberdeen. This book, which appeared last year in England, joins the work of a distinguished company of recent British interpreters of the history of science: Singer, Taylor, Pledge, Wolf, Butterfield and others.

The scope of this survey extends from the Ionians to the end of the 19th Century. The starting point

rests on the authority of Gordon Childe who maintains that, although the Ionians did not create science, they were the first to seek the generalized scientific knowledge. In the main, the content of the book is conventional. About two-thirds is devoted to physics and one-third to biology. Somewhat more space is given to the corpuscle-wave controversy in the 17th and 18th centuries than is usual in introductory books.

In procedure, Wightman has been influenced by the "strategy and tactics" study of conceptual development as outlined by Conant and the Harvard group. Philosophically, Wightman mentions Collingwood and Whitehead as his main creditors. The debt to Collingwood's *The Idea of Nature* is apparent. The author shows more sympathy for vitalism in biology, which is likely due, at least in part, to the influence of

Whitehead's organicism. Both Collingwood and Whitehead stand outside the main movement of accepted thinking on the philosophy of science in England and America today. Collingwood's attempt to reduce philosophical interpretation to the single category of "history" was a failure. Whitehead's organicism, while influential in certain groups, is a sterile approach to the analysis of contemporary scientific ideas.

The influence of these philosophers is relatively minor in the bulk of the volume because of the reliance on conventional sources. It is strange that the student is nowhere referred to the fundamental work of George Sarton. However, this book should be ranked alongside Sedgwick and Tylor as a good usable introductory text for courses in the history of science.

INTRODUCING THE UNIVERSE

by James C. Hickey

Dodd, Mead, New York, \$3.50

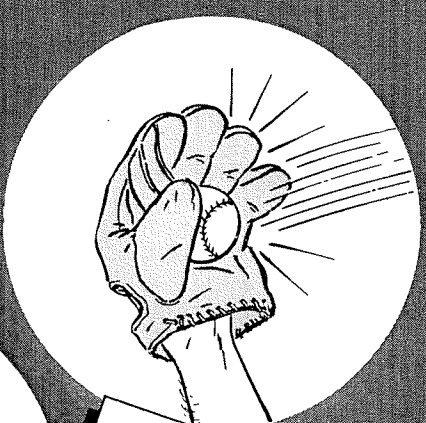
*Reviewed by Robert S. Richardson
Mount Wilson and Palomar
Observatories*

THIS BOOK is designed for those whose interest in astronomy has been aroused and who wish to know something about it without wading through the details of a textbook.

Mr. Hickey writes in an easy conversational style, including just enough anecdotes and personal incidents to enliven the factual material. He starts by answering the question so often asked astronomers: "What is the use of studying the stars anyhow?" He handles this chapter very ably by showing how astronomy has enlarged our original narrow conception of the universe as well as contributing in a practical way by leading to the discovery of the basic laws of motion. With that out of the way it is an easy matter to proceed with the description of the various bodies of the solar system, the stars, nebulae, and the expanding universe.

This book is the only one of its type I can recall that pays a long overdue tribute to the curbstone astronomers. My first observation was made through the telescope of

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a curbstone astronomer, and it was a much greater thrill than a peek through the 200-inch some 40 years later. As Mr. Hickey says, the curbstone astronomer often has a much deeper knowledge of his subject than one might expect.

In a short popular book it is often difficult to be strictly accurate, but this one seems remarkably free from errors. Kepler might better be described as an inspired computer rather than a "brilliant mathematical light." The temperature at the center of the sun is now believed to be 19,000,000°C instead of 25,000,000°C. It has decreased alarmingly in the last ten years. A campaign is being launched to scotch the statement that a sunspot endured for 18 months in 1840 and 1841. Mr. Hickey doubtless got this from the *Astronomy* by Russell, Dugan, and Stewart; who, in turn, got it from Young's *General Astronomy*. The longest authentic record for the duration of a spot group is that of 134

days in 1919. Some of the statistical data on the planets might better have been put in a single table instead of the text, but this is a matter of opinion. Mr. Hickey has done a good job. His book is a well organized, thoroughly enjoyable introduction to the universe.

INTERNAL COMBUSTION ENGINES

by Lester C. Lichty

McGraw-Hill, New York \$7.00

*Reviewed by Peter Kyropoulos
Assistant Professor of Mechanical
Engineering*

LICHTY'S BOOK on internal combustion engines has for years been an outstanding text as well as reference work for the practicing engineer. The new (sixth) edition follows the previously established pattern which includes thermodynamics, structure and performance. There are a goodly number of examples showing current practice, yet the book is not burdened with excerpts from catalogues. Since the last edition (1939) there have been many new developments in automotive engines. These have been

treated and correlated with basic theory. Probably the most important addition is the inclusion of gas turbines and rocket engines.

The pertinent cycle analyses as well as an extensive treatment of fuels other than gasoline and fuel oil are included. Numerous references give material for further study.

The chapter on abnormal combustion, formerly called "Detonation and Knock Testing," has been renamed in accordance with present practice. "Combustion Knock and Knock Rating," and the contents of the chapter have been considerably refined. The effect of design and operating variables on octane requirements are discussed at length and the concept of knock-limited performance is given its full significance.

A short section on lubricating oil additives has been added, in which unfortunately no references are given, which is disappointing in such an important subject. A comprehensive section on cylinder wear is added, including numerous references which will ultimately expose the reader to additional data on additives.

A comparison of high-speed engine indicators is given in the section on performance.

In spite of all these additions, the number of pages has been kept the same, which shows that the existing material has been carefully reviewed.

I should call Lichty's book the most comprehensive and concise text available at present.

GAS TURBINES

by H. A. Sorensen

Ronald Press, New York \$6.50

*Reviewed by R. H. Sabersky
Assistant Professor of Mechanical
Engineering*

DR. SORENSEN'S BOOK discusses in some detail the subject of gas turbines, with particular emphasis on aircraft gas turbines, which is in accordance with the recent technical developments. The book contains twelve chapters, and the first five are devoted to a review of thermodynamics and basic gas turbine cycles. The later chapters treat in some detail the thermodynamic design of the gas turbine components, i.e., the axial flow compressor, the centrifugal compressor, the combustion chamber and the turbine proper. A brief chapter on structural design problems is also included. A considerable amount of practical information is given in these chapters and the information is well up to date. The book does not require any extensive mathematical background.



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