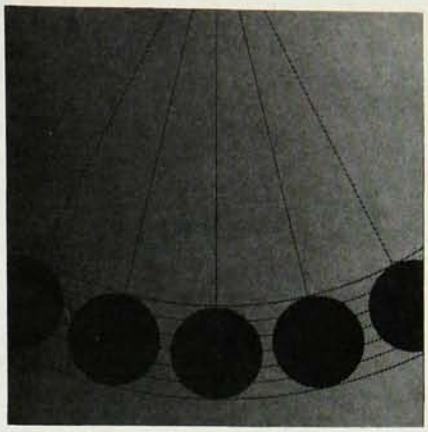
contributions of the Galilean and Newtonian schools to the evolution of the concept are discussed, though the historical treatment is inadequate; no attempt is made to trace the development of the idea from ancient times, as has been done fairly recently, for example, by Erwin N. Hiebert in *Historical Roots of the Principle of Conservation of Energy* (University of Wisconsin, 1962). It is difficult to establish a valid historical perspective without a study of this sort. The contributions of D'Alembert, Lagrange and Hamilton are reviewed briefly.

The next chapter moves on to thermal energy and the foundations of thermodynamics. The historical treatment of the development of the mechanical theory of heat is very scanty. For example, the significant contribution of Robert Mayer is dismissed with only a casual reference. For the most part the material here reduces to a didactic account of the well known principles of thermodynamics and their statistical interpretation.

Field energy is next introduced with the discussion largely confined to the electromagnetic field. No effort is made to inaugurate the treatment from the standpoint of the more readily grasped idea of energy in elastic material media. The effect of special relativity on the energy concept is indeed brought into the picture successfully.

The quantization of energy through the agency of the quantum theory has played an enormously important role in modern physics, and a chapter of some 30 pages is devoted to it. Here again the discussion tends at times to drift away from the energy concept proper to a review of the principles of quantum mechanics.

The chapter entitled "The Conservation of Energy" could have been more appropriately incorporated in the earlier historical discussion. Its chief contribution otherwise is an exposition of the relation between conservation and symmetry principles in mechanics. The final chapter is a purely philosophical investigation of the "reality" of energy. This problem, of obvious ontological interest to professional students of metaphysics, seems no longer to have relevance in the philosophy of science.



Since the treatment is confined to the physical sciences there is no reference to the very great role energy has recently begun to play in the life sciences, not to mention the problem of energy control in general, as treated in cybernetics. For the most part the style is clear and readable. There are a few careless lapses. For example, Hamilton's principle (page 43) is not stated with complete correctness, and on page 58 the statement of the relation between the first law of thermodynamics and perpetual motion is misleading.

The bibliography is relevant and rather generous in extent. The reader of this book will undoubtedly find himself stimulated to dig more deeply into the subject.

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*The reviewer is now engaged on a rather extensive project involving the concept of energy.*

## Public eavesdropping

THE WAY OF THE SCIENTIST: INTERVIEWS FROM THE WORLD OF SCIENCE AND TECHNOLOGY. Robert Colborn, ed. 382 pp. Simon and Schuster, New York, 1966. $8.95

***by M. W. Friedlander***

Interviews, when reprinted verbatim, often appear very unsatisfactory. Missing are the tones of voice that give emphasis and the expressions and hand movements so useful as further aids. In the volume under review, are transcribed interviews that have appeared over several years in *International Science and Technology*. This monthly journal is directed towards professional scientists and engineers in relatively senior positions, and its contents are invariably interesting. A regular feature has been the interview with prominently placed scientists and administrators. The intention with the present collection, is to "give the public a chance for the first time to eavesdrop on these intimate and thoughtful conversations taking place within the private world of the scientist." The list of men interviewed (no women are included in this group) is impressive: from scientists active in distinguished careers (Charles H. Townes, Abdus Salam, Victor Weisskopf) through those who have shifted their efforts to administration and on to presidential advisors, the rector of Moscow State University and a group of British emigrés now working in the United States.

The overall effect is somewhat disappointing. The collection is scrappy to read. For far too few of the interviews is it possible to assign a date and so place them in context. Much of the questioning is pedestrian, and the role of the editorial marginal notes is unclear. Some notes are surprisingly terse considering the topic (for example, bootstrap formalism on page 99) whereas some notes are surely needed for many of the more technical topics arising in the discussions that must be unfamiliar to many readers. Yet, on the other hand, it is thought necessary to have a note to define molecular weight (page 107).

Some (but far too few) of the men interviewed come to life—Leo Szilard, lamenting trends that these days get in the way of being able to undertake spur-of-the-moment checks on sudden ideas; Peter Debye, concerning students and education; Albert Szent-Gyorgyi the most alive of all. But these bright spots are few and too far apart. Too often the interview runs over familiar ground, exposing well-worn tracks but few personal or new views.

I must admit to having approached this review from a very different angle. Many of us are concerned with bringing to nonscientists some appreciation and understanding of some of the many facets now presented by science and technology. This is indeed one of the avowed aims of the present volume. Next semester, in a

new junior-level course for students in the humanities and social sciences, I shall want to explore some of this territory. I think that I might be able to use some of these interviews as assigned readings prior to some discussions. But the interviews are generally too brief for any topic to have been explored much beyond its barest introduction, and far too often a potentially interesting line is abandoned too rapidly (for example, Salam, on the problem of basic science in a developing country).

For those who have followed the concurrence of science and public policy for some years and have some awareness of trends in research, this book will make occasional light reading, but I am afraid that for nonscientists much might be incomprehensible, not least because of the jargon and brevity of the editorial notes.

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*The reviewer, who teaches at Washington University, has been active for several years in presenting scientific information to a wide audience through the St. Louis Committee for Nuclear Information.*

## Applied math reference

DISTRIBUTIONS AND THE BOUNDARY VALUES OF ANALYTIC FUNCTIONS. By E. J. Beltrami, M. R. Wohlers. 116 pp. Academic Press, New York, 1967. $6.50

*by Garrison Sposito*

This interesting little book describes the way in which analytic functions of a single variable whose boundary values are distributions, rather than square-integrable functions, may be dealt with rigorously. In particular, the class of functions analytic in a half plane and of polynomial growth at infinity are discussed at length and are shown to possess a relation with their boundary values comparable to that known for functions of the Hardy-Lebesgue class. The subject is relevant to physics because the so-called "vacuum expectation" values arising in the theory of quantized fields are distributional boundary values of analytic functions of polynominal growth at infinity.

The book is divided into three chapters, two of which are introductory. The first is a summary of the relevant parts of the theory of distributions. (As the discussion is somewhat abbreviated, the serious reader, unless he is an expert, should have at hand a good text on functional analysis.) Careful attention is paid here to the extension of the Fourier transform to tempered distributions. The second chapter discusses the Laplace transform in the same sense and offers the important distributional analog of the Paley-Wiener theorem. The last chapter is based largely upon the authors' research and deals with the generalization of the Cauchy integral to include the representation of analytic functions having distributional boundary values. Such work has great practical significance in that it would evidently widen the class of functions that can be considered in the solutions of the Dirichlet and modified Hilbert problems. (The latter, of course, includes the Wiener-Hopf technique.) At the end of the book are two short appendices on the representation of positive-real matrices and the extension of the results of the third chapter to functions of several variables.

*Distributions and the Boundary Values of Analytic Functions* can be recommended as a useful addition to the libraries of the interested applied mathematician and the quantum-field theorist, especially if the memorable little tome by Streater and Wightman is already upon the shelf.

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*The reviewer, an assistant professor of physics at Sonoma State College, Rohnert Park, California, is interested in quantum statistical mechanics and mathematical physics.*

## Modern numerical techniques

REVIEW OF MATHEMATICAL METHODS FOR DIGITAL COMPUTERS, Vol. 2. A. Ralston, H. S. Wilf, eds. 287 pp. Wiley, New York, 1967. $11.95

*by George H. Weiss*

If one wants to learn the elements of numerical analysis, this volume is not a suitable introduction. However, if one wants a summary of selected modern numerical techniques together with a flow-chart and in some cases, a FORTRAN program, this volume together with the first of this series will fit the bill in admirable fashion. Some of the topics taken up are the solution of ill-conditioned linear equations, numerical single and multiple quadrature, spline functions, the solution of polynominal and transcendental equations, random-number generators and rational Chebyshev approximation. Although this is not for the general reader, it is a must for those in computer installations.

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*George H. Weiss is chief of the Physical Sciences Laboratory, Division of Computer Research and Technology, National Institutes of Health.*

## Warmly recommended thermometry

THE MEASUREMENT OF TEMPERATURE. By J. A. Hall. 96 pp. Barnes & Noble, New York, 1966. Paper $3.75

*by Martin E. Straumanis*

The author states in the "Preface" that this book has been written to replace two books, published in 1953 by the Institute of Physics Monographs for Students entitled *Fundamentals of Thermometry* and *Practical Thermometry* because they were out of print and in many respects, out-of-date. The present book of the well known author contains, of course, the matter of the earlier volumes in a considerably revised form and new developments in the field of temperature measurement.

The book starts with the temperature scales (absolute and thermodynamic), with the discussion concerning the absolute zero point ($-273.15 \pm 0.01$°C) and with the International Practical Scale of Temperature. Thereby the distinction between reproducibility (precision) and accuracy of the measurements is emphasized. For instance, although the melting point of gold can be reproduced with a resistance thermometer within ±0.01 °C, the accuracy of this point, comparing the results of various investigators, is only ±0.5 °C, because of systematic errors.

The next chapters deal with the