

A Festschrift for Hans A. Bethe

PERSPECTIVES IN MODERN PHYSICS: ESSAYS IN HONOR OF HANS A. BETHE. R. E. Marshak, J. W. Blaker, eds. 673 pp. Interscience, New York, 1966. \$19.50

by Eugen Merzbacher

The task of anyone who wishes to review the accomplishments of the latest Nobel laureate in physics has been made delightfully easy by Robert E. Marshak and J. Warren Blaker. As the editors of a "Festschrift" published in Hans Bethe's honor in 1966, when he became 60, they have appended to this collection of papers and essays a comprehensive bibliography of his writings. The list spans the period from 1928 to 1965 and contains 139 titles, including several important books.

This impressive compilation documents one of the most productive careers in theoretical physics and shows Bethe's amazing range of interest from crystals to mesons, from accelerators to nuclear structure and from shock waves to energy production in stars. There is no division of the American Physical Society that is not in his debt for some pioneering investigations, and the profession as a whole must be grateful to him for presenting to the general public an engaging picture of a model physicist who works very hard at his métier and speaks if and only if he has something to say.

To this reviewer, who has been entirely dependent on the record for an assessment of the man and his influence, Bethe has in his writings and public utterances exemplified the finest qualities a scientist can possess: an acute sense of what problems are profitable to attack; the determination and power (both physical and mental) to carry the solution of a chosen problem through to definite numerical answers; the ability to communicate clearly and the willingness to give time to expository writing; the judgment needed not just to approximate, as we all must, but to approximate sensibly, as only some can; and a gift for calm and reasonable comment on

public issues without fear or rancor but with a rare combination of logic and compassion.

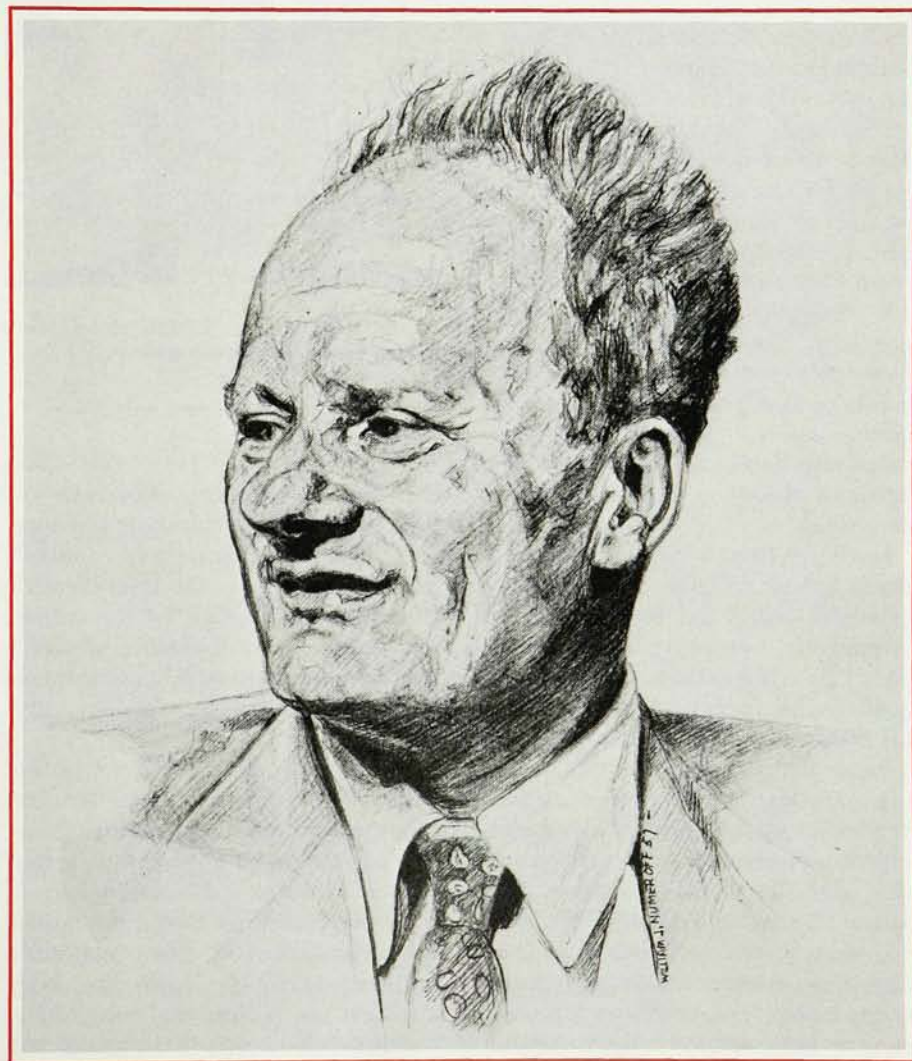
One of Bethe's important contributions to physics has been his training of distinguished students. In "*Perspectives in Modern Physics*," a number of these have been joined by their mentor's friends and colleagues in a varied tribute. The editors' instructions apparently suggested that the articles be "informal and provocative," and several of them meet this specification. As an indirect result of Bethe's own versatility, the topics

range from straight reviews on pion and phonon physics to speculations on the limits of quantum electrodynamics and on extraterrestrial technology. With so many outstanding physicists contributing to the book, uniformity should not be expected, and it must suffice that almost all the papers are interesting and few of them so technical that the commuting physicist cannot enjoy them on the subway.

Of the 41 articles, 12 are on nuclei and particles, three on accelerators, four on quantum electrodynamics, nine on cosmic rays and astronomy,

HANS A. BETHE. "The great craftsman of our profession, the master of the trade . . .," he has exemplified the finest qualities a scientist can possess.

WILLIAM J. NUMEROFF



four on aggregate matter, and seven on the physics and engineering of nuclear devices. Robert R. Wilson's recent appointment to the directorship of the National Accelerator Laboratory makes his "Anecdotal Account of Accelerators at Cornell" particularly timely.

A lecture by Robert Oppenheimer, given not long before his death and bearing the same title as the book, makes especially good reading. Oppenheimer speaks in his very personal, somewhat guarded style, with great

wisdom and unusual simplicity, about ideas and ideals that concern us all.

Robert F. Bacher and Victor F. Weisskopf have provided an introductory chapter on the career of Hans Bethe. They have been generous enough to put in print, as footnotes, some anecdotes that in the past have been current only in oral tradition, and they have written as authoritative an evaluation of Bethe's work as one could hope to produce when the subject of the account is still very much on the scene. For, Hans Bethe

is not only busy lecturing his students at Cornell and the rest of us at APS meetings, but he is deeply involved in a massive program of calculations on nuclear matter. His bibliography will surely continue to grow, and we can expect his high standards of workmanship to serve all of us as a guide for years to come.

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Eugen Merzbacher, who writes on quantum mechanics, is spending the current academic year as a visiting professor at the University of Washington.

Is science a society?

THE SOCIAL SYSTEM OF SCIENCE. By N. W. Storer. 180 pp. Holt, Rinehart and Winston, New York, 1966. Paper \$3.95

by R. Bruce Lindsay

The impact of science on society has been studied in depth for some time, and most scientists believe that they understand its role in this respect. The author, a member of the sociology department at Harvard University, has, since 1961, contributed several articles to the literature on the social aspects of science. In this book he has set for himself a somewhat different field of investigation. He tackles this question: Do scientists as a group form a society with a social system analogous to the great systems recognized by sociologists, namely, those associated with man as an economic, political, religion- and family-forming animal? Storer believes that the answer is yes and has framed an ingenious theory or model to justify his answer.

Having defined a social system as a "stable set of patterns of interaction, organized about the exchange of a qualitatively unique commodity and guided by a shared set of norms that facilitate the continuing circulation of this commodity," the author proceeds to argue that the community of scientists satisfies this definition. The commodity in this case is competent response to created scientific knowledge and the norms are those previously laid down by Robert K. Merton, namely, universalism, organized skepticism, communability and disinterestedness. The emphasis throughout is on basic science as distinguished



A SOCIOLOGICAL LOOK at scientists finds science is indeed a society.

from applied science. The reviewer feels that this limitation is an unhappy one. There are relatively few individuals who can satisfy the strict creativity criterion laid down by the author, and yet there are thousands of scientists who do make valid contributions to science short of making basic discoveries.

That the majority of scientists would agree that they form a social community is doubtful, but it is at any rate of interest to have the well considered views of a sociologist looking from the outside at their multifarious activities. Among the interesting problems to which Storer directs his attention are professional recognition, the distinction between the genius and

the crackpot, secrecy in scientific research, the financial support of science, the growth in number of scientists and the "publication explosion" and its implications for the future of science. Scientists of all kinds will find the book challenging reading.

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The reviewer is Hazard Professor of Physics at Brown University. He is interested in and has on occasion written about the sociology of science.

For student involvement

PRINCIPLES OF PHYSICS, A PROGRAMMED APPROACH: Vol. 1, FOUNDATIONS OF MECHANICS; Vol. 2, MECHANICS AND THERMODYNAMICS. By Neil Ashby, Stanley C. Miller. 240 pp. and 261 pp. Allyn and Bacon, Boston, 1966. Paper \$5.95 each

by Oakes Ames

These two volumes are a contribution to the literature of introductory physics texts that is unique not so much for the choice or ordering of material as for being a programmed presentation. For the benefit of those who may not have encountered this method, the purpose of a programmed text is to involve the student as much as possible in working out the material for himself as he reads. To work through a programmed text requires a measure of self-discipline and sometimes may seem slow going. There is little doubt, however, that if the author carefully develops the steps the reader must take, the end result is an efficient and rewarding method of study. Specifically, the page is divided into two columns, the right-hand one being the text. The text is divid-