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By contrast, the related paper by Sir Charles Harington, Director of the National Institute for Medical Research, is restrained, penetrating, and authoritative; and we infer that research is best directed when a strong scientist inherits a strong organization.

Foundations of Information Theory. By Amiel Feinstein. 137 pp. McGraw-Hill Book Co., Inc., New York, 1958. \$6.50. Reviewed by George Weiss, University of Maryland.

This book contains a complete account of the mathematical foundations of information theory. The author has more or less filled in the missing details in Shannon's original papers and given a fairly precise account of the definitions involved in the theory as well as the main coding theorems. There are no applications given and the book is written in such a manner as to be of interest to mathematicians only.

Nuclear Structure. No. 8 of Investigations in Physics. By Leonard Eisenbud and Eugene P. Wigner. 128 pp. Princeton U. Press, Princeton, N. J., 1958. \$4.00. Reviewed by Kamal K. Seth, Duke University.

Ten years ago there were very few books devoted to nuclear physics and Bethe's articles in *Reviews of Modern Physics* (1936) represented by far the most exhaustive survey of the subject. The wartime and subsequent development of nuclear physics was essentially unavailable to the student in book form. At the beginning of this decade Blatt and Weisskopf's monumental work and some other books, not so precisely defined in their subject matter, were published. Between Blatt and Weisskopf, Sachs (and other specialized texts on chosen aspects of nuclear physics), and these elementary texts, there existed a huge gap—sometimes a little too wide to be spanned in one leap. Surprisingly, while more and more books continued to appear in either category in the following years, not much was published to fill this gap. What was needed was a book on theoretical nuclear physics, which, in a concise manner, presents the major developments in nuclear physics, and can be understood by the first- or second-year graduate student. Furthermore, it would be expected that experimentalists, and other researchers in physics, would also profit by such a book—a book which is authoritative enough to satisfy their needs, yet not too demanding of their mathematical abilities, and most important, not bulky enough to scare. Well, here's the book.

The names of Eisenbud and Wigner have been associated in the past with some of the most formidable and intensely mathematical developments in nuclear physics. Hard as it may be to believe—this book lives up to its promise, it is essentially nonmathematical. Wherever mathematics is necessary, only the results are mentioned and an attempt is made to interpret their derivation and meaning in physical terms. This does occasionally lead to situations; unexplained symbols, and

even wrong symbols (e.g., p. 74, 4th line from bottom, U_{ss}^0) appear, and the language becomes too involved in explaining mathematical results (e.g., the supermultiplet theory), but such occasions are few and far between. On the whole, however, the book makes extremely fascinating and informative reading.

What is more, this small book (127 pages) covers in broad sweeps a surprisingly large portion of nuclear physics. Special emphasis is placed on the description and relation of various nuclear models and on nuclear reactions involving "close collisions" as well as "surface reactions". There are chapters on theories of β decay and electromagnetic transitions in nuclei. The book also contains an excellent bibliography which, instead of just being a list of references, is punctuated with remarks outlining the importance, and sometimes even critically commenting on the results, of these works. This one feature of the book, one hopes, will become increasingly popular.

While this book is not intended to be a text book, it is, in the reviewers opinion, indispensable to the student who seeks to know the problems of nuclear physics and not just its achievements, to the teacher who wishes to have a definitive summary of what should constitute an excellent program of teaching, and to the research worker, who likes sometimes to read an authoritative, yet simplified description of apparently complicated things.

Frontiers in Science: A Survey. Edited by Edward Hutchings, Jr. 362 pp. Basic Books, Inc., New York, 1958. \$6.00. Reviewed by Sidney D. Warshaw, Argonne National Laboratory.

This volume of about 350 pages consists of 32 articles, split into three main sections: The Biological Sciences (with an introduction by G. W. Beadle), the Physical Sciences (introduced by Harrison Brown), and Science and Society (not the Social Sciences—introduced by Hunter Mead). Many of the contributors are eminent in their fields. Probably none of them was aware, at the time of writing, that his contribution would one day be put into a book intended to convey to the "thoughtful layman" an idea about methods of attack on the advanced outputs of science.

Most of the articles have evidently been taken from the magazine *Engineering and Science*; some are from speeches. All of the authors are somehow associated with the California Institute of Technology either because they are members of the staff, or a recent graduate, or a student at present, or because the substance of their article was in a speech given in some Caltech group.

The biological section has an article, "The Origin of Life", which does not once mention Oparin's now classic work of the same name, and is largely concerned with the ancient history (van Helmont, Leewenhoek, Pasteur). A paragraph or two is devoted to the virus work at Berkeley. (There is a promise of a Plate 1 after a line about the splitting off of nucleic acid from a pro-

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by **J. V. Jelley,**

*B.Sc. Ph.D.,
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FROM the earliest days of the history of radioactivity, it was noticed that various substances emitted a feeble light under the influence of radiations from radioactive substances, and this, in course of time, was found to be fluorescent light. Čerenkov discovered in 1934 that a very weak solution was visible even from pure liquids, and a detailed study of a large variety of pure liquids led him to the conclusion that this new phenomenon was of a different nature from that of fluorescence. The effect, which soon became named after him, was three years later interpreted by Frank and Tamm (1937) on the basis of classical electromagnetic theory.

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