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This is a responsible position. The physicist we hire will be directly responsible to top management. His duties will include:

- (a) Research into various phases of optical-metrological phenomena and applications thereof.
- (b) Creation of an advanced R & D program necessitating the application of advanced scientific knowledge.
- (c) Provide evaluation and guidance regarding optical instrumentation.
- (d) Establish standards of functional performance and supervise interpretation and use for our instruments.

The work will be challenging, highly creative and diverse. There will be considerable opportunity for working in close contact with the foremost laboratories of the country in the development of improved research equipment.

If you have a Ph.D. or its equivalent with at least 5-10 years of optical experience, you should write or telephone (collect) to fully explore this position. Salary will be commensurate with experience and background. All applications will be considered without regard to race, color, creed or national origin, and will be kept in strict confidence.

Contact: Mr. R. E. Steinman
GAERTNER SCIENTIFIC CORP.
1201 W. Wrightwood Ave.,
Chicago 14, Illinois.
Phone: Buckingham 1-5335

in thought at least, one comes to the *atoms*, and further subdivision is impossible"? That is what happens on page 1—and throughout the book a similar perversion of emphasis spoils the story for our innocent learner. No, the book will do him no lasting good. What, for example, if he stops to think philosophically, will he make of the statement (p. 11), "Every study [after 1897] showed that cathode rays and electrons were the same thing"? Or, if he retains his critical awareness as far as p. 179, of the statement "a nucleus may be considered to behave like a drop of liquid which has a *surface tension* [authors' italics] capable of producing forces that lock the nucleons inside"? And, if he doesn't think critically, is he any the better if he commits this statement to memory, so that he can impress his friends with it?

At the other extreme, there is a graduate student preparing for his written examination. The seventeen chapter headings of this book, from "Atoms and Electrons", through "Fusion and Fission", to "New Adventures in Physics", will certainly pinpoint topics to which he will do well to devote attention. The running text will do something to break down these topics for him, saving him trouble, perhaps, in organizing his thought. Let him hope to find anything more solid in it, however, and he will be disappointed. His supervisor, maybe, might assign him a chapter, now and again, to rewrite as an exercise, correcting the facts of history and of physics (is it incorrect, or only misleading, to state (p. 13) that J. J. Thomson "was the first to separate the isotopes of nonradioactive elements"?), and redressing the emphasis in favor of experiment throughout.

What, then, of the authors' claim? One reader, at least, finds it altogether too optimistic. But, let it be repeated, to make a success of a book of the aims of this one must be an onerous undertaking. Perhaps the most likely person to succeed is someone who has taught atomic and nuclear physics to undergraduates, over many years, as a branch of *experimental* physics—not as a branch of theory.

Transmission of Information. A Statistical Theory of Communications. By Robert M. Fano. 389 pp. The MIT Press and John Wiley & Sons, Inc., New York, 1961. \$7.50. Reviewed by W. T. Wintringham, Bell Telephone Laboratories.

IT is a pleasure indeed to read a well-written text by an acknowledged authority in his field. As the author states in his preface: "The book is specifically directed to graduate students and engineers interested in electrical communications. It emphasizes the points of view and methods of analysis which are likely to prove most useful to them in their future work." To which this reviewer can add only that Professor Fano has fulfilled this promise in a very able fashion.

Particularly in the fields of communication and of information theory, where these words mean different things to different groups, a reader may find it neces-

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sary to scan the whole of a new book to determine whether it covers the special field of *his* interest. Professor Fano has spared the reader this problem. In the first chapter, he makes a complete and explicit statement regarding the purpose of his text and defines the problem which he treats, i.e., communication of information from a source to a user, under the condition of a fidelity criterion specified by the user.

The author then develops measures of information from elementary considerations of the probabilities involved in choosing one message from the universe of possible messages. When the reader has reached the end of the second chapter, he will have found that he has been exposed to a terse review of the elements of information theory as introduced by Shannon.

The remainder of *Transmission of Information* is devoted to studying how information transmission is influenced by the characteristics of the message source, the channel, and the coding system. Of particular interest is the closing chapter in which the effect of the choice of codes on error rate is treated for discrete, constant channels.

Each chapter is concluded with a brief list of references. Problems for each chapter are given in an appendix. Since no answers are given, these turn out to be exercises for both the student and the instructor.

A useful table of entropy for a binary alphabet as dependent on the probability of one of the two symbols and a brief table of the Gaussian distribution function are given in appendices. The entropy table, including as it does binary logarithms, is a valuable portion of the book.

This is one of the few books in the specialized field of information theory which can be read with profit by the amateur. At the other extreme, it should be useful as a formal text for a graduate course on this subject.

The Scientist in American Industry. By Simon Marcson. 158 pp. Industrial Relations Section, Department of Economics, Princeton University, Princeton, New Jersey, 1960. \$3.00. *Reviewed by W. S. Emmerich, Westinghouse Research Laboratories.*

THE rapid growth of industrial research since World War II and the subsequent shortage of scientific personnel have added to the problems faced by industrial research management. The author has endeavored to look at a typical industrial research laboratory through the eyes of those whose daily lives are spent within its walls. His material stems from interviews with the personnel of a particular, fairly representative laboratory, which is referred to as the PEC Laboratory, a fictitious name. For alert sleuths, its true identity, though inconsequential, should be quickly apparent. For readers with lesser talents, clues are liberally sprinkled throughout the text. The goals of the corporation and those of a scientist are outlined. Two, sometimes conflicting, objectives are immediately evident: company profit vs. professional orientation. This gives