Radio Corporation of America and by M. M. Wachtel, D. D. Doughty, and A. E. Anderson of the Westinghouse Research Laboratories. This pre-eminently practical approach is by no means as impressive as the imaginative application of optical feedback to a single-stage image tube. The use of a single photocathode-phosphor pair regeneratively coupled by an optical system is discussed by Arthur Roberts of the University of Rochester and by Martin L. Perl and Lawrence W. Jones of the University of Michigan. The difficulties of this approach are clearly outlined and one can hope that solutions to the several important problems will be found.

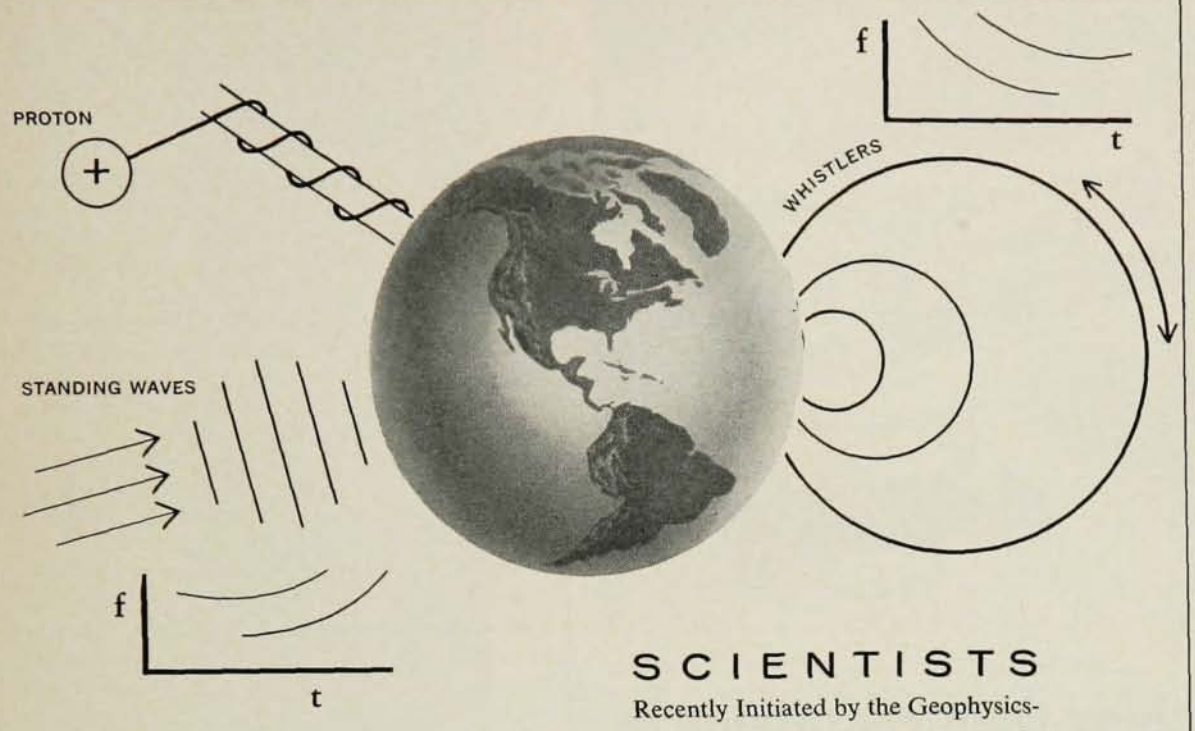
Another imaginative approach to the problem of increasing the sensitivity of image tubes is that taken by J. D. McGee, E. A. Flinn, and H. D. Evans of Imperial College and by J. Burns and M. J. Neumann of the University of Chicago. Each of these groups is working to interpose a large number of parallel electron multipliers between the photocathode and the fluorescent screen. This approach may turn out to be entirely impractical, but it is refreshing to find experimenters who are willing to exhaust its possibilities in the face of such pessimism.

Even though these new tools are more sensitive than those previously available, one is struck by the fact that not a single participant in the symposium felt that the limit had been reached. The ultimate limit, of course, is set by the fact that the quantum efficiency of a photocathode must always be less than unity. But at present the performance is still bounded by electron-optical deficiencies, stray emission within experimental tubes, and by similar phenomena rather than by quantum efficiency.

The subject matter of the thirty papers in these proceedings ranges from bare descriptions of laboratory experiments to theoretical studies of the performance of image systems. Except that papers on solid-state image intensifiers are missing, any student of photoelectric image devices will find at least one paper in this volume treating his field of interest. The papers taken collectively give the student a good picture of the state of the art as of the date of this symposium.

Foundations of Electromagnetic Theory. By John R. Reitz and Frederick J. Milford. 387 pp. Addison-Wesley Publishing Co., Inc., Reading, Mass., 1960. $8.75. *Reviewed by Jacques Romain, University of Elisabethville, Katanga.*

THIS is not just another textbook on electromagnetism, but a rather different one from those which every physicist knows. One of its main features is the use of atomic concepts to enlighten the study of electromagnetic fields inside matter, and a simple exposition of the relations of microscopic and macroscopic pictures of electric and magnetic fields in that case. There is also an introduction to plasma physics: general principles and typical examples chosen to make clear the main approaches to plasma physics. The in-



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clusion of such topics in a textbook for advanced undergraduate students is to be welcomed. Although they are generally considered the field of specialists, they are important enough to justify giving undergraduate students a basic idea of the question. The authors have proved it possible.

As a general procedure, the authors start from a summary of known experimental facts, proceed by straightforward reasoning to a rigorous theory, and solve several important examples to link theory and problems. Every chapter ends with a collection of interesting problems, mainly of a practical kind (the answers to odd-numbered ones are given). Giorgi's rationalized system of units is used throughout the text. The exposition and general aspect are clear and pleasant; there are useful figures and tables. But the book lacks a general list of references; literature is referred to only in a few chapters. Although the book is a very good one indeed, every student can benefit by looking through more than one textbook.

The contents include a summary of vector analysis, a practical treatment of boundary problems, a short introduction to the mechanism of metallic conduction and to transient behavior of a circuit under a slowly varying emf, plane and spherical electromagnetic waves, reflection and refraction, and waveguides. Anisotropic materials are alluded to on several occasions, but are not handled in this book.

X-Ray Absorption and Emission in Analytical Chemistry. Spectrochemical Analysis with X-Rays. By H. A. Liebhafsky, H. G. Pfeiffer, E. H. Winslow, P. D. Zemany. 357 pp. John Wiley & Sons, Inc., New York, 1960. $13.50. *Reviewed by Harry C. Baden, Eastman Kodak Company.*

THE publication of this book will be welcomed by the practicing analyst, for the authors have produced a usable handbook on x-ray spectrochemical analysis. With instrument manufacturers providing increased automation, greater precision and speed of analysis, x-ray spectroscopy is being increasingly applied in the modern analytical laboratory. The authors, fully experienced in this technique, present a complete résumé of the field as it is known today. To the analytical chemist who is just beginning to employ x-ray spectroscopy and to one who must consider the advisability of doing so, this book is particularly pertinent.

The origin and properties of x rays are traced historically in the introductory chapters, many sections of which are headed interestingly by quotations from original publications. A logical sequence of absorptiometry, thickness measurement, and emission spectroscopy follows. Many specific examples from the literature as well as hitherto unpublished experiences from the authors' laboratories well illustrate the sensitivity and precision obtainable by these x-ray techniques. For the analyst, discussion of the problems of excitation efficiencies, and matrix or interelemental absorption and enhancement effects, and the treatments of pulse height