

and Medicine" by V. K. Zworykin, and "Electrical Properties of Tissues and Cell Suspensions" by H. P. Schwann. There is also a special kind of radiobiology described by R. E. Zirkle in "Partial-Cell Irradiation", which harks back to 1912. It means the irradiation of cells with beams of radiation small compared with cell dimensions which in turn involves the construction of "isodiametric apertures" for defining the beams. The making of such microapertures and the definition of a beam make a fascinating story.

In quite another direction in radiobiology Richard Setlow summarizes recent data on the responses of biochemical processes and microorganisms to radiations in the range from optical into the ultraviolet in "Action Spectroscopy". The data are complex and point up the many unknowns in living systems. This is brought out also by Albert Rose's discussion of "Quantum Effects in Human Vision", which ends by describing some problems for future research as seen by a trained physicist. This published discussion of research problems in vision is excellent and one wishes for more like it in other branches of biophysics. For example when he discusses the topic "Vision and Evolution", the result is biophysics at its best because the topic challenges the human capacity to know physics and also to understand the end products of evolution.

Kerninduktion. By A. Lösche. 605 pp. Veb Deutscher Verlag der Wissenschaften, Berlin, Germany, 1957. DM 39.60. Reviewed by L. C. Levitt, *Hughes Research Laboratories*.

This timely, well-written and comprehensive book is probably the best yet to appear on this subject. The author's plan was for a presentation intermediate between that of a textbook and a specialist's monograph—and this seems to have been well met. The contents are fairly strictly limited to nuclear paramagnetic resonance spectroscopy, with occasional short digressions into neighboring fields. The format is somewhat that of a collection of essays touching on a central theme. However, whatever lack of unity and "style" the book suffers from, and perhaps this is hardly avoidable with full coverage of the present subject, is counterbalanced by clarity and by a wealth of useful material.

After a brief introductory survey, two chapters are devoted to theory, one to experimental techniques, and a concluding chapter is devoted to applications and results. Further calculational details and a very useful tabulation of nuclear and molecular constants are relegated to appendices. The book concludes with a remarkably thorough bibliography covering most of the relevant literature through early 1957.

The theoretical discussion, very clearly presented on an intermediate level, is divided into classical and quantum-mechanical parts, one chapter being devoted to each. Commencing with a detailed discussion of the classical top model, the Bloch equations are set up and studied in detail, a variety of solutions being presented

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and discussed. Considerable attention is given to non-stationary solutions, especially for pulsed excitation, the spin-echo techniques being treated very thoroughly. The quantum-mechanical theory is largely devoted to a lengthy survey of Van Vleck's work on line shapes in rigid lattices and to the Bloembergen theory of relaxation, which is given considerable elaboration. Quadrupole resonance is given a brief treatment.

The discussion of experimental methods is almost equally good, though somewhat more disjointed. Electronic techniques are very well treated; signal-to-noise ratios are calculated for various detection schemes, bridge circuits and regenerative detectors are discussed at length, and the design of rf heads is considered. Considerable space is devoted to material on the setting up, stabilization, homogenizing, modulation, and measurement of magnetic fields. The designs of several types of spectrometers are reviewed in detail.

The material on results and applications covers many topics, with a just sufficient degree of thoroughness. The classical material on determinations of spins and g factors is well-covered in a moderate space; the main emphasis is on effects giving line broadening, fine structure, and chemical shifts, with numerous applications to the elucidation of molecular structure in liquids and solids.

Everyone who is interested in nuclear resonance or its application will find this book rewarding reading and a valuable reference source. It may be confidently recommended.

The Fundamental Constants of Physics. Vol. 1 of Interscience Monographs in Physics & Astronomy. By E. Richard Cohen, Kenneth M. Crowe, Jesse W. M. DuMond. 287 pp. Interscience Publishers, Inc., New York, 1957. \$7.50. Reviewed by H. Mendlowitz, *National Bureau of Standards*.

The title might sound somewhat drab and unexciting except to those whose interests are in the physical constants. However, the authors have been able to present in a very readable fashion the problems involved in delineating and defining the "fundamental" constants; the problems in the measurement of these constants; and the relationships among the various measurements. In this book one finds discussions of almost all aspects of what we may define as physics, and it is happily surprising that so much has been dealt with in so effective a manner as to hold the reader's interest; at least this reviewer found it so. The authors do not merely list the latest values of the fundamental constants (which in itself would be important), but they also introduce the reader to the history and reasoning behind the measurements. It is interesting to learn that very few of the prewar experimental data were good enough to be utilized in the present analysis.

This book is an expanded version of the article in Volume 35 of the *Handbuch der Physik* by the two senior authors (E. R. Cohen and J. W. M. DuMond). It is written in a more leisurely manner and is a better