ELECTRICITY. By Charles A. Coulson. 254 pp. Interscience Publishers, Inc., New York, 1948. $3.75.

A remarkably concise and clear mathematical exposition of basic electrostatics, steady current flow, magnetostatics, circuit equations, and Maxwell's equations in the best classical tradition, complete with such trimmings as electrostatic and magnetostatic unrationalized units. Working knowledge of vector analysis is required. In Chapter 9 the reader is expected to have some acquaintance with Legendre functions. Generally the book is for graduate students in applied mathematics and mathematical physics. It contains a large number of problems, all with answers.

Units are not as important in such a treatise as they are in an engineering text; still they are important to the extent to which applied mathematicians, interested in electricity and magnetism, are likely to contribute to the development of this science. For this reason Professor Coulson's treatment of units is disappointing. In the preface he makes a noble announcement to the effect that ". . . the discussion of units and dimensions has been deferred to a final chapter, and very little direct reference to them . . . is made in the main body of the text." One would have expected therefore to see noncommittal factors of proportionality in Coulomb's force equations; but there are no such factors. These factors are immediately made equal to dimensionless unity, thereby introducing classical units and the classical attitude toward the physical entity we call 'electric charge.' We cannot possibly disagree with Professor Coulson's contention that units ". . . nearly always cause the student a lot of trouble"; we might even agree, although not wholeheartedly, that "the use of practical units from start to finish does not make the fundamental ideas any clearer"; but we feel that what causes the student a lot of trouble is not any particular system but the multiplicity of systems, particularly the kind of multiplicity inherent in classical units. In this respect, Professor Coulson is not making the student's lot easier; and we cannot reconcile his admission on the last page of the book that the m.k.s. rationalized system has largely superseded other systems with his letting these other systems sneak through a back door. We would not have been so disappointed had the book been not as good as it is.

S. A. Schelkunoff
Bell Telephone Laboratories, Inc.

MIT RADIATION LABORATORY SERIES. Louis Ridenour, Editor-in-Chief. McGraw-Hill Book Company, Inc., New York, 1948. Vol. 5, Pulse Generators, edited by G. N. Glasoe and Jean V. Lebacqz. 741 pp. $9.00. Vol. 6, Microwave Magnetrons, edited by George B. Collins, 806 pp., $9.00. Vol. 21, Electronic Instruments, edited by Ivan A. Greenwood, Jr., J. Vance Holdam, Jr., and Duncan Macrae, Jr., 721 pp., $9.00.

It is scarcely necessary to comment further on the high degree of competence and the extensive coverage of the books of this series.

The volume on pulse generators is a good guide in designing pulsers for radar, and it gives a good picture of most of the sorts of pulsers used during the war. The material most likely to be used in other connections would seem to be that on switches (rotary spark gaps, special sealed gaps, special hard tubes for handling high currents for short periods, hydrogen thyratrons), the material on pulse-forming lines, and that on the pulse transformers used in handling rapidly changing voltages.

The admirable book on magnetron oscillators is the authoritative work on the subject. It shows how much there is to know about just one special type of vacuum tube. It also shows how a well-organized theoretical and experimental attack leads both to increased understanding and to better results. The material in the various sections, Resonant Systems, Analysis of Operation, Design, Tuning, and Stabilization and Practice, is of great value not only in connection with magnetrons but also as a background for work on other types of microwave vacuum tubes.

The brief title "Electronic Instruments" covers four diverse fields. The section on electronic analogue computers tells how to perform various mathematical operations such as addition, subtraction, multiplication, integration, differentiation, and generation of functions by means of potentiometers, servos, feedback amplifiers, and assorted other devices, and how to combine these operations in analogue computers capable of handling complicated equations. The section on instrument servomechanisms covers the differential equation approach, the 'frequency analysis' or steady state approach, and many practical details. Nonlinear theory is disposed of in five pages of summary and bibliography. The sections on voltage and current regulators and on pulse test equipment will be of value to all physicists who are somewhat shaky (and who isn't?) on what circuits and tubes to put into those indispensable black boxes.

J. R. Pierce
Bell Telephone Laboratories

Books Received

THEORY OF THE STABILITY OF LYOPHOBIC COLLOIDS. By E. J. W. Verwey and J. Th. G. Overbeek. 205 pp. Elsevier Publishing Company, Inc., New York, N. Y., 1948. $4.50.

TRANSACTIONS (Instruments and Measurements Conference, Stockholm, 1947). 252 pp. Norrköpings Tidningars Aktiebolag, Sweden, 1948.

FLUORESCENT AND OTHER GASEOUS DISCHARGE LAMPS. By William E. Forsythe and Elliot Q. Adams. 292 pp. Murray Hill Books, Inc., New York N. Y., 1948. $5.00.

ELECTRICITY AND MAGNETISM. By M. Nelkon. 431 pp. Longmans, Green & Co., Inc., New York, N. Y., 1948. $2.75.

FM TRANSMISSION AND RECEPTION. By John F. Rider and Seymour D. Uslan. 416 pp. John F. Rider, New York, N. Y., 1948. Cloth $2.70, paper $1.80.

TABLE OF COEFFICIENTS FOR OBTAINING THE FIRST DERIVATIVE WITHOUT DIFFERENCES. By Herbert E. Salzer. National Bureau of Standards Applied Mathematics Series No. 2. 20 pp. United States Government Printing Office, Washington, 1948. 15 cents.

TABLE OF INTERPLANAR SPACINGS IN ANGSTROM UNITS IN TERMS OF 2θ FOR DIFFERENT TARGET MATERIALS. By Suzanne E. A. Beatty. Research Report R-94602-10-C. 18 pp. Westinghouse Electric Corporation, East Pittsburgh, Pennsylvania. Available on request.