

Electronics Engineering Specialist

The Systems Support element, Nortronics, a division of Northrop Corporation, has an opening for an Electronics Engineering Specialist, in Anaheim, California.

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PhD in Physics or Electronics with 7 to 10 years of applicable experience desired. MS or BS degrees with greater experience will receive full consideration.

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mathematical theory. The bibliography would be helpful in such a seminar and is a good bibliography for one beginning a study of linear programming.

Physique Electronique des Gaz et des Solides. By Michel Bayet. 246 pp. Masson et Cie, Paris, France, 1958. 4,900 fr. *Reviewed by R. Bruce Lindsay, Brown University.*

This volume covers essentially the content of a course offered by the author in the science faculty at the University of Toulouse, where he is Maître de Conférences d'Electronique. It represents the attempt to introduce a certain unity into theoretical electron physics by deducing the electrical properties of both gases and solids from the behavior of a Lorentz gas of electrons immersed in an aggregate of heavy particles (molecules or ions). This unifying thread is the chief merit of the book, since the topics covered are by and large the usual ones encountered in the standard texts on physical electronics.

The book begins with a brief review of physical statistics, both classical and quantum, and with a consideration of collision cross sections in the interaction of the particles of an aggregate. This is followed by the elements of the kinetic theory of gases, including a derivation of the Boltzmann equation, the classical distribution function and the standard transport properties. The Lorentz electron gas is then introduced and its properties discussed for the nondegenerate case. This leads to a consideration of the propagation of electromagnetic radiation through a Lorentz gas and the study of plasma oscillations. Two chapters are devoted to standard material on electric discharges through gases. The last two chapters are devoted to the electron theory of metals, first in terms of the old Sommerfeld theory and then using the Bloch-Brillouin quantum theory of energy bands.

The book is clearly written and there is a definite attempt to connect the theoretical developments with experimental results. Unfortunately its use as a reference book is considerably diminished by an inadequate index.

Dynamical Analogies (2nd Revised Ed.). By Harry F. Olson. 278 pp. D. Van Nostrand Co., Inc., Princeton, N. J., 1958. \$6.75. *Reviewed by Peter L. Balise, University of Washington.*

This second edition of the well-known work originally published in 1942 is welcome, both for the additional material now included and because the subject is of increasing importance. Modern computational aids promote more exact analyses, which results in greater recognition of the fundamentally analogous mathematical behavior of systems which appear physically to be quite different.

This edition consists of the entire first edition essentially unchanged, which is reasonable since fundamental theory has not changed, plus additional material. The older material is a comprehensive presentation of the

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equations describing the behavior of analogous electrical, rectilinear mechanical, rotational mechanical, and acoustical systems by impedance analogy. The equilibrium equations for the single degree of freedom systems are obtained by both force balance and power balance, and Lagrange's equations are used for systems with several degrees of freedom. Transient response is obtained for the step input and the general input by indicial admittance, but not by unit impulse response. There are good chapters on electrical-mechanical-acoustical transducers.

The new material is about 75 pages at the end of the book dealing with noise and distortion, magnetic analogy, feedback, and the mobility analogy. The chapters on noise and distortion and the magnetic analogy are brief but outline the subjects well. Some interesting applications of feedback are given, but the treatment is so abbreviated as to give an inadequate appreciation, particularly of the stability problem. The "mobility analogy", which is a method of obtaining an electrical analogy of a mechanical system by considering velocity as analogous to voltage and force to current, is thoroughly discussed.

There is little attention given to synthesizing analogous systems by logical procedures, but instead systems are presented by types; i.e., corrective networks and frequency filters, in which form the data is likely to be most directly useful. Because of this, and because the emphasis is on stating equations without detailed introductory derivations, the book is primarily an excellent reference rather than an explanatory text.

The Green Flash and Other Low Sun Phenomena. By D. J. K. O'Connell, S.J. 192 pp. (Vatican Observatory, 1958) Interscience Publishers, Inc., New York, 1958. \$6.00. *Reviewed by C. C. Kiess, National Bureau of Standards.*

Is the green flash a genuine meteorological phenomenon, or is it only a subjective experience? This question has been asked by many who have tried repeatedly to observe it, but without success. Among them may be counted both the reviewer of this book, who caught his first view of it only recently after many unrewarding attempts, and also its author, who confesses that after many unsuccessful trials, in various situations, he "saw it for the first time, and very clearly, at sunset over the Mediterranean from my office window at Castel Gandolfo". His aim in writing the book is to establish beyond all doubt the objectivity of the green flash from recent photographic evidence, free from psycho-physiological bias.

The textual matter of the book is brief and is intended to serve primarily as an introduction to the exhibit of photographs that it presents. The first section is historical and traces the story of the green flash from first mention of it in ancient literature to the more precise descriptions of it in recent observations. The second and third sections discuss the theories of the phenomenon, ranging from the purely physiological to those rep-