

of the different members of each family are then considered. This is followed by the more practical details on design and performance.

The diagrams throughout are very clear, and although the theory is presented in some detail, the various mathematical steps are always made plain and can be easily followed. The initial German edition appeared in 1952, but the large amount of extra material incorporated in the English translation makes it virtually a new book.

Electromagnetic Phenomena in Cosmical Physics: Internat'l Astronomical Union Symp. No. 6 (Stockholm, Aug. 1956). Edited by B. Lehnert. 545 pp. (Unesco) Cambridge U. Press, New York, 1958. \$10.00. *Reviewed by P. M. Morse, Massachusetts Institute of Technology.*

THE introduction of magnetohydrodynamics has caused an upheaval in astrophysics nearly as basic as quantum mechanics did in physics. This collection of 56 short papers on solar and interplanetary magnetic fields and their effects, which are the proceedings of a symposium held in August 1956 in Stockholm, is a snapshot of the state of knowledge extant at that time. Subjects discussed include the usual magnetohydrodynamic topics, both theoretical and experimental, the electrodynamics of solar flares, sunspots and corona, and the interaction between these and cosmic rays, terrestrial magnetic storms and aurorae. The papers are short and not expository, so the book is not appropriate for an introductory treatment of the subject. The papers do give a good picture of the state of "magneto-astro-physics" three years ago; this reviewer found the records of the discussions following each paper particularly interesting. Much of the material is not yet out of date, though some data and conclusions regarding phenomena in the neighborhood of the earth need modification in the light of satellite and other IGY results.

The Design of Physics Research Laboratories: British Inst. of Physics Symp. (Royal Inst., London, Nov. 1957). 108 pp. (Chapman & Hall) Reinhold Publishing Corp., New York, 1959. \$4.50. *Reviewed by T. Teichmann, Lockheed Missiles and Space Division.*

UNTIL comparatively recent times physics research laboratories have been confined almost entirely to universities and have involved rather modest experiments in terms of facilities and people. As a result, their design has not been critical and has generally been determined by personal taste of the director of the institution, if it has not been completely arbitrary. In modern times, however, the scope of physics experiments in universities has become greatly enlarged and often requires vast quantities of expensive and heavy equipment and hoards of technical people at all levels of training. At the same time physics research laboratories have become more common in large industries

which previously confined their "research" to pure product development.

This expansion in the scope, cost, and significance of physical research has made it important to devote more careful thought to the design of physics research laboratories and the symposium here reported presents some illuminating and constructive views of the problems involved from the point of view of the architect, the scientist, and the plant engineer.

As might be expected, the criteria which emerged from such a discussion are by no means uniform from laboratory to laboratory, and indeed this is as it should be, for the nature of the activities carried out varies considerably and must of course play a crucial role in the design of buildings and laboratories. What is important is that many of the significant considerations be recognized and taken into account. In the large industries in the United States in which physics laboratories are now being built, one of the defects has been that their design has often been entrusted to worthy plant engineers with a long history of successful factory construction behind them who have tended to design physics factories rather than laboratories. This book should be particularly valuable to such people because it contains substantial contributions from more enlightened members of their profession. The problem in such cases is often complicated by the presence in the laboratories of a large industry of a substantial amount of industrial labor involved in developmental work which bridges the gap between pure research and mass fabrication. This symposium report contains a very valuable contribution in this connection from the UKAEA Group on the design of laboratories which makes allowance for both types of activities in a manner enabling each of them to operate effectively.

Mathematics Dictionary (2nd Revised Ed.). Edited by Glenn James and Robert C. James. 546 pp. D. Van Nostrand Co., Inc., Princeton, N. J., 1959. \$15.00. *Reviewed by P. J. Davis, National Bureau of Standards.*

IT is the privilege of men who read dictionaries to see how their favorite words have made out at the hands of the lexicographer. Parallelepiped: one-half column plus figure. Eigenvalue: one-third column, but only matrices and integral equations seem to have eigenvalues. Transformation: long article listing at least 25 different kinds of transformation. Gaussian quadrature: nothing. Stochastic matrix: nothing. Lebesgue-Stieltjes integral: $1\frac{1}{3}$ columns. Schrödinger equation: nothing. Lattice: a partially ordered set, but nothing said about rectangularly spaced sets of points. Abel's theorem: in, for power series; out, for impossibility of solving certain algebraic equations. Gödel's theorem: out. Poisson's ratio: in. Poisson's bracket: out. BTU: in. Torsional rigidity: out.

So it goes. This revised and augmented edition containing an additional 40 pages of definitions and glossaries in French, Spanish, German, and Russian of about 1500 terms each, seems to be everywhere dense