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Review

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The author provides introductory sections for the reader. However, the book will probably find its widest audience among students and researchers in solid mechanics and acoustical physics. The introductory sections include cartesian tensors, linear elasticity, Maxwell's equations, and the linear theory of piezoelectricity. The presentation of this material is very clear. Tiersten is careful to point out restrictions implied in the theory and what approximations can be made in the application of the theory to plate vibrations. No attempt is made to discuss the nonlinear theory of piezoelectricity.

The second part of the monograph examines the dynamics of standing wave vibrations in piezoelectric plates of infinite extent. Solutions to the coupled electromagnetic and elasticity equations of motion are discussed along with the frequency dispersion relations that result.

In the third part the author takes the reader on a survey of approximation techniques in piezoelectric plate vibration problems. This section is basically a summary of his and his coworkers' research experience and advice.

The now classical power series expansion in the thickness direction is discussed. The resulting equations, along with variational and least square approximation methods, are employed to solve specific boundary value problems, including the vibration of partially electrode piezoelectric plates.

While the first two parts of this book could serve as a text for part of a graduate course in piezoelectric dynamics, the third part seems more limited to those interested in the particular boundary value problems considered.—*F. C. Moon, Aerospace and Mechanical Sciences, Princeton University*

Scientific Study of Unidentified Flying Objects by EDWARD U. CONDON, edited by D. S. GILMOR, introduced by W. SULLIVAN. 967 pages. \$12.95. Dutton, 1969. (Complete report on study conducted by University of Colorado under research contract with the U. S. Air Force.)

In this report, which has been generally accepted as the scientist's definitive answer to the UFO problem, one must distinguish between the body of the report, containing studies of UFO reports made by individual members of the committee, and the summary and conclusion written by the principal investigator, Dr. Condon, seemingly, however, with incomplete understanding of the former. For there is a disturbing dichotomy: Condon's summary rejects the UFO phenomenon as a chimera, while many of the contributing authors present, collectively, as good a case for its importance and study as anyone could have assembled with limited resources and no prior knowledge.

Press accounts of this report have been almost entirely limited to the contents of Condon's summary, in which he uses as illustrations exclusively cases which are silly, easy to explain, or poorly reported. Yet his colleagues present in the very same volume cases which resisted the most meticulous attempts at rational explanation. As one example, Condon says of the now famous McMinnville photos only that "the UFO images turned out to be too fuzzy to allow worthwhile photogrammetric analysis." His photographic expert, however, devotes eight pages to the photogrammetric analysis and concludes: "This is one of the few UFO reports in which all factors investigated, geometric, psychological, and physical, appear to be consistent with the assertion that an extraordinary flying object, silvery, metallic, disc-shaped, tens of meters in diameter, and evidently artificial, flew within sight of two witnesses." There are many such examples.

This reviewer would recommend a careful reading of that relatively small portion of the report devoted to the investigation of a tiny sample of the total available puzzling UFO reports (the major portion of the report is given over to elementary expositions of radar, meteorological optics, and general physics), so that the reader may form his own judgment of this controversial document.—*J. Allen Hynek, Astronomy, Northwestern University*

The Design of Design by GORDON L. GLEGG. 93 pages. \$4.95. Cambridge University Press, 1969.

In many respects the topic of this book is very timely since the teaching of engineering design at the college and university levels has been a controversial issue in recent years in a number of quarters. The book is written in an entertaining, almost reminiscing manner by a design engineer who has a rich and varied background in "invention." It is strictly qualitative and descriptive in nature but gives some real feeling as to what is involved in creative engineering design in a civilian-consumer-industrial context. Glegg does this by describing actual design experiences and problems he encountered in industry as a consultant and privately as an inventor.

In his presentation he seems to offer support to a number of sides to the argument as to whether it is possible and desirable to attempt to involve students in design experiences. The quotations that follow will illustrate the range of his philosophy of design: "Computerize all that can be conveniently done and release young minds more for the adventure of originality" (p. 65). "The engineer both pictures and creates in three dimensions. Unlike his fellow artist, he need not

interpret, his dreams literally come true" (p. 62). "The inventive element is essentially independent and unforced. Subsequently disciplined or not by art or logic, it initially stands in its own ground and owes nothing to its neighbors. Expert experience in the field is not essential; in fact, too great a knowledge of existing techniques may be a handicap" (p. 50).

The book is recommended for students who would like to gain an impression of an experienced inventor's approach to creative engineering design, and to academics who may have lost touch with some of the exciting real-life problems that exist in the civilian-consumer industries.—*Steve M. Slaby, Civil and Geological Engineering, Princeton University*

The Surface of the Earth by A. L. BLOOM. 152 pages. \$5.95 cloth; \$2.50 paper. Foundations of Earth Science Series. Prentice-Hall, 1969.

This brief book is the only paperback, except for Morisawa's specialized one on streams, in which the many recent trends in geomorphology are capsulized. The opening chapter on "Energetics of the Earth's Surface" admirably and imaginatively sets the stage. Chapter 2, "Rock Weathering," is superior to many longer texts. Except for material on slope elements, Chapter 3, "Rock Fragments in Motion," is rather traditional. Fluvial

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