papers of this conference is included at the end of the volume.

Many of the papers are concerned with new applications of or with technical improvements in photoelastic methods for determining stress fields. An interesting paper by H. W. Loof and G. A. F. van der Sande briefly discusses applications of a recently developed analogy, called the moiré method, to problems of thermal stresses in plates and bending stresses in thin shells. Still other papers describe improvements in strain-measuring instrumentation and associated devices. One device which seems particularly interesting is the subject of a paper by B. E. Noltingk. A new electrical transducer for converting mechanical displacements to electrical signals is described. It is claimed that this device has a linear range of 10 mm, and that displacements can be measured on any scale between millimeters and hundreds of angstroms.

Many papers are often short to the point of considerable sacrifice in comprehensibility and background information, and thus they appear to be addressed to active specialists in their respective fields.

La Diffrazione della Luce. By G. Toraldo di Francia. 530 pp. Edizioni Scientifiche Einaudi, Torino, 1958. Lire 8000. *Reviewed by Nicholas Chako, Queens College.*

IN recent years, a number of good books have appeared which treat diffraction phenomena as part of the entire field of optics; others, in monographs, cover specific topics of this branch of optics. In this case, the author attempts to cover comprehensively and from a classical standpoint the whole field of diffraction phenomena of light. He has succeeded admirably. The theoretical aspects of light diffraction are covered, and there is a clear and thorough exposition of the physical interpretation of the theory and its applications.

Beginning with a short introduction of mathematical analysis, which is necessary for the development of the theory, the author leisurely reviews the fundamental principles of light propagation, interference, and diffraction phenomena. There follows a detailed and clear discussion of those aspects of diffraction associated with the name of Fraunhofer, including brief discussions of evanescent waves, diffraction by one-dimensional transparent objects with amplitude and phase variation, applications to gratings and other well-known optic interferometers, two-dimensional apertures consisting of simple geometrical shapes including the rhombic aperture, as well as an extensive discussion on the resolving power and on superresolving pupils. The formation of images of objects under coherent and incoherent illumination and a brief description of the phase contrast microscope follows. The section dealing with the diffraction of luminous discs is of special interest because of its applications to astronomy. Graphs of isophotes are shown for such cases as a single disc, two discs of equal radii placed close to each other, or partially overlapping (resembling a partial eclipse). The fourth part

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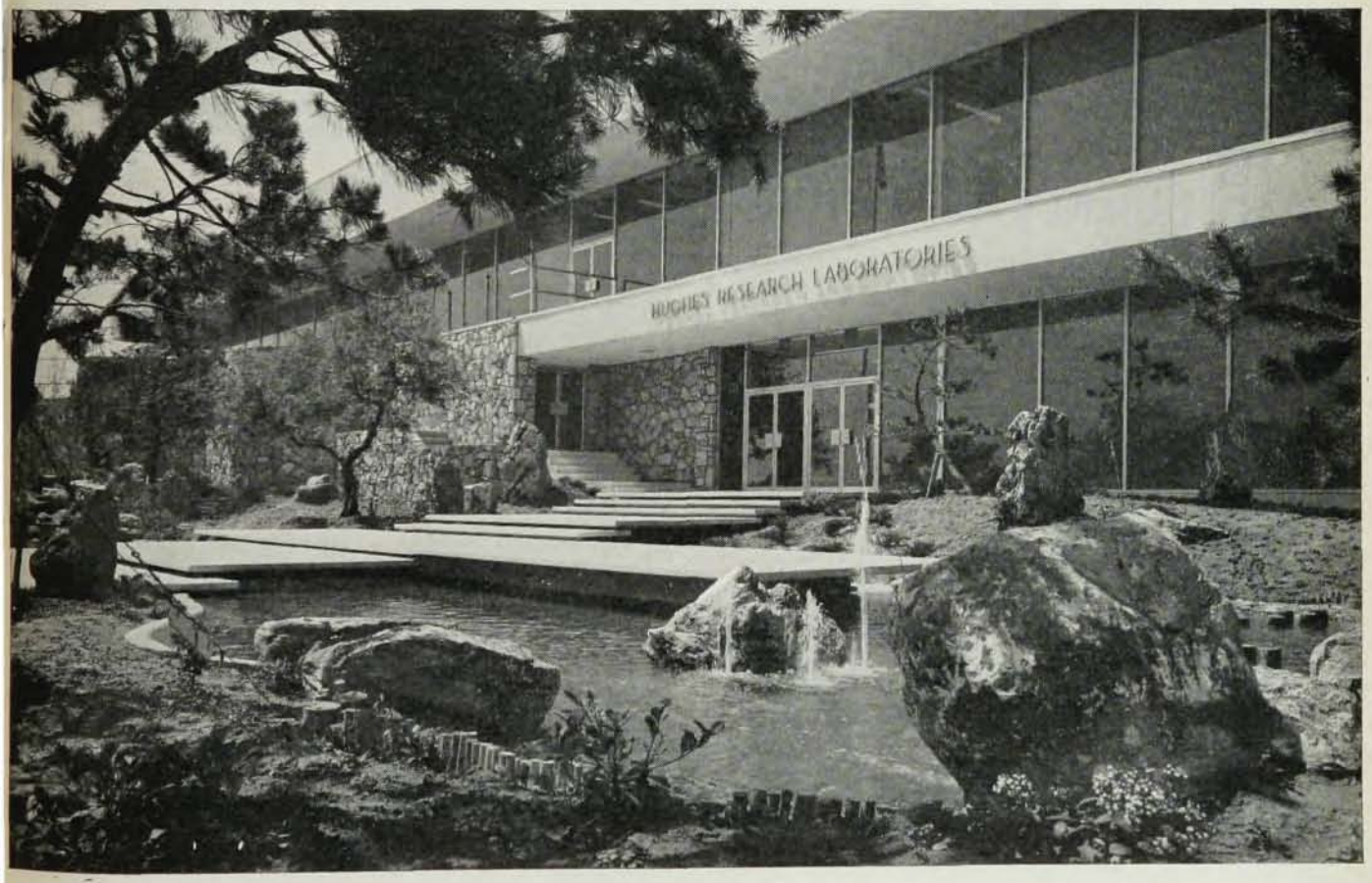

contains a complete and thorough treatment of Fresnel diffraction phenomena. One also finds interesting discussions of optical paradoxes such as those bearing the names of Poisson, Rayleigh, and Gouy on inverse interference effects and on anomalous propagation of spherical and cylindrical waves in the neighborhood of a focus. The last part is devoted primarily to the diffraction theory of aberrations.

An English translation would be welcome. However, the addition of a number of problems and exercises, as well as a chapter on the exact theory of diffraction, would be desirable in an English version of the book.

Modern Aspects of the Vitreous State. J. D. Mackenzie, ed. 226 pp. Butterworth Inc., Washington, D. C., 1960. $9.50. *Reviewed by Stuart A. Rice, Institute for the Study of Metals, The University of Chicago.*

THIS short book is an excellent survey of our current understanding of the structure and properties of glass, interpreted from a molecular point of view. Each chapter is authored by a different investigator, expert in the particular field. Structural studies are represented by chapters on x-ray diffraction, nuclear-quadrupole-resonance spectroscopy, and infrared spectroscopy. The emphasis in these reviews is on the attempt to understand local structure and to relate this to the long-range structure. The physical properties of glasses are interpreted in two lucid articles dealing, respectively, with crystallization kinetics and glass formation, and the nature of the glass transition. These articles strike an excellent balance between physical insight and a necessary minimum of mathematical formalism. Finally, there are chapters dealing with the constitution of glasses, structural models, and conductance and viscosity studies at high temperatures.

The Atom and Its Nucleus. By George Gamow. 153 pp. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1961. Paperbound $1.95, clothbound $3.75. *Reviewed by William F. Meggers, National Bureau of Standards.*

GEORGE Gamow wrote *The Atom and Its Nucleus* for the lay reader and we have only our crude culture to blame if most people read rubbish rather than exciting science delightfully presented by a famous physicist whose outstanding talents for the popularization of science earned him the Kalinga Prize awarded by UNESCO in 1956. The subject is presented in 10 chapters: The Atom in Philosophy and Chemistry; The Electric Nature of Particles; The Quantum of Radiant Energy; The Bohr Atom; Wave Nature of Particles; Natural Radioactivity; Artificial Nuclear Transformations; The Structure of the Atomic Nucleus; Large-Scale Nuclear Reactions; and Mystery Particles.

Democritus, twenty-five centuries ago, believed that there are four elementary substances: air, water, stone, and fire, all formed by a very large number of very small particles called *atoms*, i.e., "indivisibles" in Greek.