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inorganic fields such as geology and metallurgy—the last named being the first to which microradiography was applied by Neville in 1897.

This field of microscopy is an exciting one of great promise. Not only is it possible to get some idea of local chemical composition (by adsorption or emission methods) and to make accurate three-dimensional images, but the projection methods permit studies to be made at reasonably high magnification with the specimen in corrosive or high-temperature environments that preclude any other method of study.

The predominantly European authors may perhaps regret that the book has been published in the United States, with consequent American spelling and price.

6th Symposium (International) on Combustion (Yale U., Aug. 1956). 943 pp. Reinhold Publishing Corp., New York, 1957. \$28.00. Reviewed by Henry Wise, Stanford Research Institute.

The biennial combustion symposia conducted under the auspices of The Combustion Institute have become a recognized center of international scientific discussion in this rapidly expanding field of research. The sixth of these meetings was held at Yale University in August, 1956. While the preceding symposia emphasized the physical aspects of combustion, such as turbulence, and the chemical aspects, such as reaction kinetics, the Yale meeting was devoted to topics of great current interest. The papers selected for presentation at the Sixth Symposium dealt with (1) ignition and flame propagation in homogeneous combustible mixtures under laminar and turbulent conditions; (2) reactions at high temperatures as encountered in flames, shock waves, and detonations; (3) theoretical and experimental aspects of flame stabilization in fast streams; (4) combustion instability; (5) heterogeneous combustion of solids and liquids; (6) new experimental techniques in combustion research; and (7) applied aspects of combustion processes.

The current "state of the art" is described in several review papers on laminar flame propagation, on flammability limits, and on the structure of laminar, premixed flames. The progress made in our understanding of the fundamental aspects of combustion is most impressive. Yet the application of this knowledge to combustor design has hardly begun. As pointed out by Spalding (UK) the theoretical methods have neglected so far the multidimensional problems encountered in practice.

In addition to the contributed and invited papers, three panel discussions have been included which highlight some of the current problems in combustion research. While Kondratiev (USSR) stressed the role of chemical kinetics in combustion processes, Olson (USA) considered the need for future research on the physical and fluid-dynamic aspects such as turbulence, heat transfer, and combustion oscillations in modern propulsion systems. During an evening discussion dealing with detonation phenomena a brief but lively dis-

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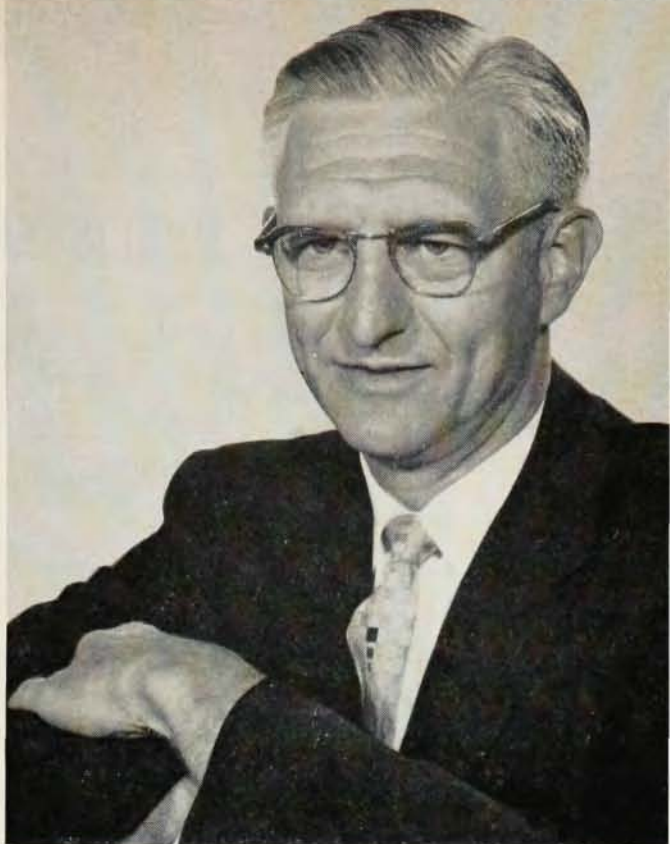
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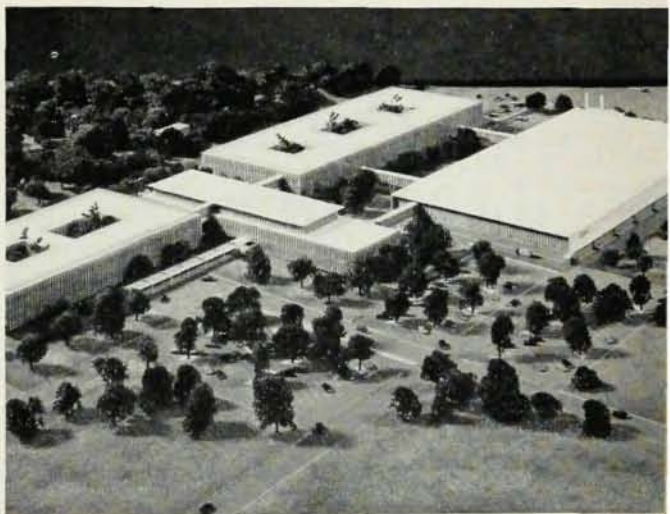
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cussion ensued on the importance of diffusion and heat conduction in a detonation.

This collection of 125 papers represents an indispensable reference volume for the specialist engaged in combustion research. Because of the important and timely contributions to be found in this book it is regrettable that the delay between the time of the meeting and the publication of this volume had to be so long.

1956 National Symposium on Vacuum Technology Transactions (Chicago, Ill., Oct. 1956). Edited by Edmond S. Perry and John H. Durant. 234 pp. Pergamon Press, London & New York, 1957. \$12.50. *Reviewed by Sanborn C. Brown, Massachusetts Institute of Technology.*

The Third Annual National Symposium on Vacuum Technology, sponsored by the Committee on Vacuum Techniques (recently renamed the American Vacuum Society), was held in Chicago in October of 1956. The transactions of this symposium are now available in published form, and some of these papers will surely be of interest to physicists in the field of vacuum technology.

The Technical Program was divided into six parts: Fundamental Developments in Vacuum Technology; Methods and Techniques for Obtaining High Vacuum; Instructions, Controls, and Other Vacuum Devices; Vacuum Distillation, Metallurgical and Chemical Applications; and Technical Subjects of Current Interest. In these categories, the first four contain material which physicists may find useful.

Many of the papers are directed toward application and technology rather than fundamental science, but several are very helpful as adjuncts to the normal literature in the basic research field. "Experiments on Flow of Gases through Leaks" by A. Nerken, "Development of the Thickness of Evaporated Films by a Multiple Beam Interference Method" by G. David Scott, and "Fluid Flow Conversion in Leaks and Capillaries" by D. J. Santeler and T. W. Moller are typical examples, which supplement the ordinary reference material to a considerable degree. The several papers on vacuum pumps and vacuum gauges and their calibrations will not only prove useful to the research worker in the field, but provide good background material as well as reference material to graduate students and seniors who are beginning to find their way around the many types of pumps and gauges available in the various low-vacuum regions of the modern physics laboratory. There are also a number of papers on types of leak detectors which, although too short to be really useful as an introduction to the subject, serve to describe various types of leak detection equipment available and to explain briefly their methods of operation. Pictures of the apparatus are included so that the uninitiated may have some idea of the size of equipment associated with the mass spectrometer type of leak detector.

The final 80-100 pages of the volume cover material