treatment of its subject topic as papers usually are in this series of volumes, it should be of interest and value to a wide group of experimental and theoretical physicists.

Individual articles in this volume of reports may be purchased from the Physical Society, London.

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Fifth Symposium (International) on Combustion. Combustion in engines and combustion kinetics. Standing Committee on Combustion Symposia of the Combustion Institute. Reinhold, New York; Chapman & Hall, London, 1955. xxvi + 802 pp. Illus. $15.

The fifth symposium, held at the University of Pittsburgh, primarily emphasized the chemical aspects of combustion, especially combustion kinetics. By means of a series of invited papers, it did take cognizance of the role of combustion in the development and design of engines. Six invited papers were on the unsolved problems of engine combustion in internal-combustion engines, diesel engines, liquid-fuel rocket engines, ramjets, turbojets and solid-propellant engines. This series of six papers is a reminder that there are still objectionable odors from diesel engines, combustion instability in rockets, extremely poor combustion efficiency in ramjets, and other serious unsolved problems. Five invited papers were on combustion kinetics. These included a thought-provoking paper on high-temperature reaction systems, two papers on kinetics of hydrocarbon combustion, and two papers on space requirements for combustion.

In addition to the 11 invited papers, this volume contains the text and discussions of 90 papers delivered at the symposium. Six of the papers are on the combustion of fuel droplets. The preheat and vaporization stages, the effect of turbulence, ignition lag, fuel droplet size, mass burning rate, flame velocity, flammability limits, and flame stability, from the theoretical and experimental viewpoint, are contained in this set of papers. Nine of the papers discuss the various aspects of propellant burning such as monopropellant and bipropellant systems, ignition lags and hyperbolic fluid burning rates. Six papers treat the combustion of solids, such as carbon particles, pulverized coal, magnesium ribbon, and pyrotechnics. The experimental techniques used for the study of the kinetics of solid-phase reactions are interesting. Diffusion flames and carbon formation are discussed in five of the papers. Studies of cool flames, auto ignition, and high-turbulence combustion chambers are reported on in eight of the papers on combustion in engines.

Especially interesting are five papers on special techniques that include a new shock tube for studying high-temperature gas phase reactions, use of Langmuir probes for ionization studies of flames, polarographic studies of cool flames, microwave studies of ionization, and the use of iodine absorption spectrum for temperature measurements.

The many facets of the kinetics of combustion reactions are discussed in a total of 45 papers. Of these approximately half are concerned with the combustion of hydrocarbons. Progress is being made in correlating the reactivity of complex hydrocarbon molecules with the process of energy transfer among the bonds within the molecule. Of the final set of papers, five are concerned with flame spectra and one with the dissociation energy of the OH radical. The volume is completed with résumés of two panel discussions, one on heterogeneous burning and the other on the status of the theory of the kinetics of combustion reactions.

This book should be stimulating to research workers, engineers, and scientists who are active in the combustion field. Although much experimental work is being done, new experimental techniques seem to be required to provide the information needed to confirm the present theoretically developed concepts of the kinetics of combustion processes.

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Miscellaneous Publications

(Inquiries concerning these publications should be addressed, not to Science, *but to the publisher or agency sponsoring the publication.)*

Survey on Vibration and Shock Isolation. National Standards Laboratory Tech. Paper No. 7. J. A. Macinante. Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia, 1955. 42 pp.

The Use of Nuclides in the Determination of Organic Reaction Mechanisms. Peter C. Reilly Lectures in Chemistry, vol. XI. Lars C. S. Melander. University of Notre Dame Press, Notre Dame, Ind., 1955. 96 pp. $3.

Hospitals Served by the Red Cross Blood Program and Usage of Blood and Derivatives Distributed 1954–55. American National Red Cross, Washington, D.C., 1955. 56 pp.

Centrale Organisatie T.N.O. Jaarverslag 1954. Central Organization for Applied Scientific Research, Koningskade 12, The Hague, Netherlands, 1955. 353 pp.

Social Science Research Council, Annual Report 1954–1955. The Council, New York 17. 86 pp.

The Safety of Artificial Sweeteners for Use in Foods. A report by the Food Protection Committee of the Food and Nutrition Board. National Academy of Sciences–National Research Council, Washington, 1955. 10 pp.

Clearing the Main Channels. Thirty-fifth annual report of the American Civil Liberties Union. 1 July 1954 to 30 June 1955. American Civil Liberties Union, New York 10, 144 pp. $0.50.

The Papyrus Swamps of Uganda. G. S. Carter. Heffer, Cambridge, England, 1955. 25 pp.

Joint FAO/WHO Expert Committee on Meat Hygiene, First Report. WHO Technical Rept. Ser., No. 99. World Health Organization, Geneva, 1955. 52 pp. $0.60.

The Economics of Feed Materials and Fuel Processing Problems. J. Carlton Ward, Jr. Vitro Corp. of America, New York 16, 1955. 22 pp. Free.

Nuclear Level Schemes. A = 40 – A = 92 (Covering the Elements Ca – Zr). A collection of diagrams showing positions and properties of nuclear energy levels, characteristics of radioactive decay and nuclear reactions, together with a tabular compilation of the experimental data and bibliographic references to the original papers. K. Way, R. W. King, C. L. McGinnis, and R. van Lieshout. Nuclear Data Project, National Academy of Sciences–National Research Council, Washington, 1955 (Order from Supt. of Documents, GPO, Washington 25). 221 pp. $1.75.

Proceedings of the Conference on Effects of Radiation on Dielectric Materials. ONR Symposium Report ACR-2. Held at Naval Research Laboratory, Washington, D.C., 14–15 December 1954, under the joint sponsorship of Naval Research Laboratory and Office of Scientific Research, Air Research and Development Command. Office of Naval Research, Washington, 1955 (Order from Office of Technical Services, Dept. of Commerce, Washington). 169 pp. $4.25.

A Check-List of the Fossil and Prehistoric Birds of North America and the West Indies. Misc. Collections, vol. 131, No. 5. Alexander Wetmore. Smithsonian Institution, Washington, 1956. 105 pp.

Contributions to the Nomenclature, Systematics, and Morphology of the Octocorallia. Proceedings of the U.S. National Museum, vol. 105, No. 3357. Frederick M. Bayer. Smithsonian Institution, Washington, 1955. 14 pp.

Recherches sur les Concomitants Electrencéphalographiques Eventuels du Papillotement et de la Fusion en Lumière Intermittente. J. Rutchmann. *Archives de Psychologie,* Geneva, 1955. 100 pp.

Our Natural Resources–and Their Conservation. Pamphlet No. 230. Richard L. Neuberger. Public Affairs Committee, New York, 1956. 28 pp. $0.25.

How to Write Technical Reports and Still Maintain Your Sanity. A. D. Ehrenfried. Technical Marketing Associates, Concord, Mass. 8 pp. $0.25.

Precooked Frozen Foods, a Symposium. Advisory Board on Quartermaster Research and Development. Quartermaster Food and Container Institute for the Armed Forces, Chicago 9, 1955. 76 pp.