date periodically through the technical papers presented at these symposia. In this sense the organizers of the symposia have a great responsibility for presenting a fair and complete coverage of the high grade research throughout the world. Unfortunately the reviewer was particularly distressed that the Fifth International Symposium on Combustion would not accept any papers on the subject of the theory of flame propagation. This seemed unfortunate since it is difficult to separate the experimental from the theoretical interpretations. The illustrious members of the various subcommittees are not given an opportunity to make policy decisions. The organization of the Round Tables and the types of research presented are determined largely by the whims and prejudices of Dr. Lewis.

The categories of papers included are: Combustion in Engines, Combustion of Fuel Droplets, Propellant Burning, Diffusion Flames and Carbon Formation, Special Techniques, Flame Spectra and Dissociation Energies and Kinetics of Combustion Reactions. Approximately half of the papers pertain to the kinetics of combustion reactions. The majority of the papers are quite excellent.

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Chemistry of the Solid State. Edited by W. E. GARNER, D.Sc., F.R.S., C.B.E., Emeritus Professor, University of Bristol. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1955. viii + 417 pp. 16.5 × 25.5 cm. Price, $8.80.

This book deals with the theory of the solid state and its relationship to various physical and chemical problems. The first seven chapters present fundamental methods and theory while the next eight chapters describe applications. The fifteen chapters are as follows:

1. "Chemistry of Crystal Dislocations" by F. C. Frank introduces those aspects of dislocation theory which have importance in such chemical topics as crystal growth, crystal solution and heterogeneous catalysis.
2. "Lattice Defects in Ionic Crystals" by F. S. Stone describes in greater detail defect theory as it applies to the theory of electrical conductivity and diffusion in the ionic lattice.
3. "The Action of Light on Solids" by P. W. M. Jacobs and F. C. Tompkins is concerned with the action of light, X-ray and electron beams in introducing extra electrons, excitons, f-centers, etc., and the consequent thermal deactivation, phosphorescence or photolysis of solids.
4. "The Surfaces of Solids" by P. W. M. Jacobs and F. C. Tompkins surveys the methods of surface area measurements, pore size distributions, particle size and shape determinations, and surface tension studies as applied to finely divided materials.
5. "Semi-Conductivity and Magneto-Chemistry of the Solid State" by T. J. Gray is a review of the methods and phenomena of intrinsic and impurity semi-conductivity and di-, para- and ferromagnetism as related to solid state reactions, absorption catalysis, imperfections, etc.
6 and 7. "Theory of Crystal Nucleation from Vapor, Liquid, and Solid Systems" by W. J. Dunning and "Classification and Theory of Solid Reactions" by P. W. M. Jacobs and F. C. Tompkins together represent a good summary of the theories of nucleation and growth as presently conceived. These chapters should prove particularly useful to the investigator who desires to classify kinetic data of the nucleation and growth type.
8. "The Kinetics of Endothermic Solid Reactions" by W. E. Garner deals mainly with the kinetics of dehydration of hydrates and the decomposition of carbonates.
9. "The Kinetics of Exothermic Solid Reactions" by W. E. Garner analyzes the kinetics of the decomposition of metal azides, oxalates, permanganates, chlorates and perchlorates, nitrogen iodide, nickel formide and lead styphnate. A separate section by L. L. Bircumshaw analyzes the kinetics of decomposition of ammonium salts, mainly the nitrate, permanganate and perchlorate.
10. "The Decomposition of Organic Solids" by C. E. H. Bawn introduces the reader to some basic fundamentals in the pyrolysis of organic compounds including the theory of thermal explosion.
11. "Explosion and Detonation in Solids" by A. R. Ubbelohde describes the principal characteristics of explosion and detonation, and their initiation together with experimental methods for studying detonation velocity.
12. "Solid–Solid Reaction" by A. J. E. Welch reviews the principal phenomena and possible mechanisms involved in the reaction between two or more solids from the point of view of structural inorganic chemistry and crystallography.
13. "The Photographic Process" by J. W. Mitchell deals mainly with the changes occurring in crystals of silver halides during chemical sensitation and the formation of the latent image.
14. "Oxidation of Metals" by T. B. Grimley is concerned mainly with the kinetics and reaction mechanisms of the oxidation of those metals which form protective oxide layers, *i.e.*, those metals for which the volume of oxide formed is equal to or greater than the volume of the metal oxidized.
15. "The Electronic Factor in Chemisorption in Catalysis" by F. S. Stone summarizes the available information on the nature of the adsorbate–adsorbent bond in chemisorption.

The subject of this book is so large that it would require many volumes to deal with it exhaustively. The authors of the various chapters have in general taken great pains to delineate the area of their treatment but the reader must realize that more is often left unsaid than said. Even in the delineated areas there are some surprising omissions; surely the respected methods of the ultracentrifuge deserve a place in any review of the procedures of determining particle size and shape! The book is well written by recognized authorities; it represents in easily accessible form, critically evaluated information obtainable otherwise only in the original literature. The ample bibliographies represent a good introduction to that literature. Twelve pages of author and subject index are helpful. This book which is of graduate student level should be available to all workers in the fields of catalysis, solid state physics, gas solid reactions, solid reactions, photography, corrosion and related topics.

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Beta- and Gamma-Ray Spectroscopy. Edited by KAI SIEGBAHN, Professor of Physics, University of Uppsala. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N.Y. 1955. xxiii + 959 pp. 18 × 25 cm. Price, $20.00.

We have in this thick volume an ambitious attempt to cover in complete detail an important and well-defined branch of nuclear physics: the oldest, and once the most unintelligible branch, that of beta- and gamma-radioactivity, now generalized to beta- and gamma-spectroscopy. It is a pleasure to be able to report that the attempt is successful; a veritable handbook in the old German tradition has been produced, in which one can find almost everything of consequence on the subject.

The task of preparing such a handbook is so formidable as to daunt the bravest. We are indebted to Professor Siegbahn, as editor, and to the forty-two authors (who constitute a "Who's Who in Beta-Rays,") for tackling this task. No such complete treatment has been attempted since the appearance in 1930 of Rutherford, Chadwick and Ellis's classical treatise on "Radiations from Radioactive Substances." Even a superficial comparison will reveal the enormous magnitude of the advances of a quarter century. The earlier book appeared just two years before the discovery of the neutron, and thus essentially summarized the entire early history of nuclear physics, before anyone knew even what the nucleus was composed of. The apparent lack of conservation of energy in beta-decay had been discovered, but the neutrino had not, nor had transmutation with artificially accelerated particles, nor artificial radioactivity. At present, on the other hand, we have just reached a new milestone in the development of the theory of beta-ray decay; the choice among possible interactions responsible for the process appears to have been finally resolved to a combination of scalar and tensor forms.