This applies especially to the important recent developments made during and after the Second World War. The book gives a lucid and systematic exposition of a branch of aerodynamics which has hitherto been available to students almost solely through oral tradition.

The wide range of subjects covered by the author can be gathered from the fact that it includes discussions of problems of aero-elasticity (including the effects of flexibility of wing, fuselage and tail-plane), the effects of compressibility, automatic stabilization, a general survey of our knowledge of flaps, and the phenomena of stalling and spinning of aircraft. The last two topics are discussed in two chapters contributed by Prof. A. D. Young, of the College of Aeronautics, Cranfield.

The general plan of the treatise is to proceed from an elementary introduction of the mechanics of flight to the equations of motion of the rigid aircraft and to the solution of the dynamical equations and the investigation of stability. This is followed by a separate study of longitudinal-symmetric motion and lateral-antisymmetric motion. A special chapter is devoted to measurement of aerodynamic derivatives, and two other chapters to flap controls and controls for rolling, pitching and yaw. Other topics discussed in the book are static stability and manœuvrability.

There can be no doubt that this text-book is destined to become the classical reference for all problems of stability and control. Its clarity, simplicity, systematic arrangement and comprehensiveness make it an outstanding achievement of aerodynamic exposition.

G. Temple

ADVANCES IN CATALYSIS

Advances in Catalysis and related Subjects
Edited by W. G. Frankenburg, V. I. Komarewsky and E. K. Rideal. Vol. 3. Pp. xi+360. 7.80 dollars. Vol. 4. Pp. xi+457. 9.50 dollars. (New York: Academic Press, Inc., 1951 and 1952.)

THE task of providing an authoritative account of the present state of knowledge in the field of catalytic chemistry is a formidable one; but the importance of the theory, practice and industrial aspects of the subject must be held to merit the publication of the present series of volumes.

In the development of any theory of catalysis the number of factors affecting catalytic phenomena which have to be taken into account are many and varied and must include, for example, the chemical nature of solid catalysts and the structure, even the fine or electronic structure, of their surfaces, chemical and physical adsorption and desorption processes, the effects of catalyst poisons, ageing of surfaces, the formation of intermediates and the properties and behaviour of the products towards the catalyst surface. These are but a few of the variables which emphasize the complex nature of the sequence of processes occurring in a catalytic reaction.

These two volumes present articles by well-known workers on different aspects of catalysis, and the editors decided no attempt should be made to link these articles by anything approaching a universal theory. This was a wise decision, not only because of the absence, at present, of a universal theory of catalysis, but also, as the editors point out, since to do otherwise might have had the effect of hampering free expression of opinion by the authors. The result is that in both these volumes we have a stimulating blend of the theoretical aspects and the practical applications of many facets of surface catalysis.

Volume 3 contains eight articles of fascinating variety. It is pleasing to find that the first article gives a lucid account of Balandin's contributions to the consideration of the geometry of surfaces and the correlation of this with catalytic activity. There follows a discussion of the application of magnetic methods to the study of catalyst structure. Here, the experimental methods are clearly described and the resulting information critically examined.

The interest of the general reader is further stimulated by the abrupt change from the subject-matter of these two articles to that of the following one which deals with the catalytic oxidation of acetylene in air. This is an intensely practical problem and its importance lies in the application of such catalytic methods to the removal of the very small amounts of acetylene in atmospheric air in order to eliminate the explosion hazard in the manufacture of oxygen by distillation of liquid air.

The poisoning of metallic catalysts has always been a question of interest from the theoretical and the practical points of view, and a major work on surface chemistry would not be complete without consideration of this topic. The discussion, by Prof. Maxted, gives a good picture of our present state of knowledge; it is stimulating to consider this article in conjunction with a later one on nickel sulphide catalysts.

Some features of the catalytic cracking of hydrocarbons and the chemical characteristics and structure of cracking catalysts are ably dealt with in two chapters, and the volume is completed with a discussion of reaction-rates within the porous structure of solid catalysts.

In Volume 4, further problems in catalytic cracking processes are considered in two articles, one of which is devoted mainly to the sintering properties of catalysts used in these reactions.

Catalytic phenomena in homogeneous media are represented in this volume by authoritative contributions on acid-base catalysis, the free radical mechanism in the reactions of hydrogen peroxide, and the specific reactions of iron in some hæmoproteins.

Two articles on adsorption give, rather briefly, representative pictures of this important feature of catalytic problems. One of these is restricted to a review of recent aspects of the statistical thermodynamical theory of physical adsorption, while the other is concerned with the role of surface heterogeneity in adsorption.

A historical review of the catalytic synthesis of hydrocarbons from carbon monoxide and hydrogen provides a useful summary of the main steps in the development of this process. Much of the article is devoted to the work of Franz Fischer and his co-workers; but developments in other countries are also summarized, and there is a section on some solved and unsolved problems of hydrocarbon synthesis.

These two volumes are in keeping with the standard set by the earlier volumes in this series, and it seems certain that the editors' hope that they will be of very substantial help to both the specialist and the novice in the field of surface catalysis will be realized.

James Bell