tains useful biographic data and descriptions of professional societies and governmental and private research organizations.

The contributors are men of real stature in their fields, and their contributions are interestingly and authoritatively written, without presupposition of much chemical knowledge on the part of the reader.

The work will be most useful to those of limited technical background who are faced with locating an item of chemical information in its proper context or with developing an understanding of the nature and importance of an industrial process.

Advances in Chemical Engineering. Thomas B. Drew and John W. Hoopes, Jr. Academic Press, New York, 1956. 448 pp. Illus. $10.

This book is volume I of a series. In the foreword, the editor states: ". . . the end *Advances in Chemical Engineering* seeks to serve is to provide the engineer with critical running summaries of recent work: some that bring standard topics up to date; others that gather and examine the results of new or newly utilized techniques and methods of seeming promise in the field. Thereby, we hope to help practitioners of the chemical engineering art to keep abreast of the flood of information they are creating." This is a very worthy objective and one that badly needs attention.

This volume covers seven fields: (i) boiling of liquids; (ii) non-Newtonian technology—fluid mechanics, mixing, and heat transfer; (iii) theory of diffusion; (iv) turbulence in thermal and material transport; (v) mechanically aided liquid extraction; (vi) automatic computer in control and planning of manufacturing operations; (vii) ionizing radiation applied to chemical processes and to food and drug processing.

In the main, this volume accomplishes reasonably well those objectives mentioned in the preface. However, as with so many volumes in which the separate chapters are written by different people, the change of pace and method of approach used by the different authors are disconcerting to the reader. In each case, the bibliography of references at the end of individual chapters appears to be quite complete and is of great value to the reader who is engaged in serious research in that particular area.

One very interesting commentary on the times is the notation on the source of support which some of the authors had for their research program. Without the support of such federal agencies as the National Science Foundation, the Office of Naval Research, the Office of Ordnance Research, and the Atomic Energy Commission, much of the information in the book would not be available.

For the reader who wishes to keep abreast of the developments in the seven fields covered in this volume, the value of the individual chapters seems to be inversely proportional to the amount of mathematical treatment in the chapters.

The chapter on "Boiling of liquids" illustrates this point. It is written in a very interesting style, but many of the mathematical manipulations have to be taken on faith, unless the reader is an active worker in the area. However, the author does get over his point and shows how little is actually known about such a simple process as boiling. He emphasizes the need for the development of very careful experimental techniques in order to obtain duplicate meaningful results. This contribution alone makes this chapter worth while.

The inclusion of the chapter on "Non-Newtonian technology" (fluid mechanics, mixing, and heat transfer) is a valuable addition to the literature, since few chemical engineers understand the meaning of this subject, and engineers other than chemical have even less cognizance of the subject. The chapter will be of particular value to those who are concerned with manufacture of objects from plastic raw materials.

The chapter on the "Theory of diffusion" contains a large amount of material, garnered from a variety of sources, which has not appeared previously in such concise form. The chapter constitutes a good source reference and gives clues on how to solve a large variety of problems, but in many instances the information is not complete in itself, and the reader must refer to the original literature. This is to be expected in a condensation of this sort.

The chapter on "Turbulence in thermal and material transport" illustrates the difficulty in basing conclusions on incomplete data. The author states: "At present the background of experimental data is sufficiently sparse that most of the prediction of the influence of turbulence upon transport must be made by analogy." If the chapter will stimulate research to answer some of the unknowns, it will have accomplished its purpose.

The chapter on "Mechanically aided liquid extraction" contains some useful descriptive information on means for accomplishing extraction. The mathematics in the chapter detracts from, rather than improves, the reader's understanding of the process involved. The qualitative descriptions are quite good.

In the chapter on "The automatic computer in the control and planning of manufacturing operations," the author has managed to cover the field of usefulness of computers very well in a short space. Although this is not the first time that this has been attempted, in my opinion this is the best condensation to date.

"Ionizing radiation applied to chemical processes and to food and drug processing" is the subject of the final chapter. The authors do a fine piece of work in exploding certain myths about the use of radiation processes. At the same time, they pinpoint the areas where the use of new techniques is very promising.

I consider this volume a worth-while contribution to the literature of chemical engineering in two respects: (i) it brings the general reader up to date in seven diversified areas (he will lose little if he skips the mathematical presentation); and (ii) the active research worker in these fields will find the summaries useful and the literature references valuable.

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Engineering Structural Failures. The causes and results of failure in modern structures of various types. Rolt Hammond. Philosophical Library, New York, 1957. 224 pp. Illus. $12.

The scant literature on structural failures is considerably enriched by this work. Except for a few technical articles on the cause of failures (the number of which is in sharp contrast to the large number of descriptions of successes in engineering work), there have previously appeared only a short book on *La Pathologie du Beton Arme,* by Henry Lossier (1952), and a translation of the 1854 work of Alexandre Colin on *Landslides,* by W. R. Schriever (1956). In recent years I have had published several lectures on the causes and lessons of structural failures, and in so doing, have been subjected to some criticism for suggesting an open forum where all may learn from mistakes made. It is quite evident that the author is similarly restrained, and that much available information is not included in his book.

Eight general classes of engineering structures and problems are covered: earthworks, dams, maritime structures, buildings, bridges, underground works, vibration problems, and welded structures. A chapter follows on "Lessons of failures." If the author had not deviated from his topic by including several interesting and informative discussions not pertinent to the subject, space would have been available for more examples of the many recorded failures in each of the classes covered, thus making it possible to show the generally consistent patterns which seem to be conducive to "incidents" in engineering structures.

The random samples of earthwork