

Book Reviews

Chemical Engineering Practice. vol. 1, *General*. vol. 2, *Solid State*. Herbert W. Cremer, Ed. Academic Press, New York; Butterworths, London, 1956. xiv + 494 pp.; xxii + 632 pp. \$17.50 per volume (\$13.30 per volume on orders for complete set).

The first two volumes of this comprehensive work (there will be 12 volumes in all), considered on merit alone, give evidence of a major contribution to chemical engineering literature. The editors (Herbert W. Cremer and managing editor Trefor Davies), the publishers, and the contributors of the many authoritative chapters are to be congratulated for undertaking the long-needed task of bringing together all that is chemical engineering. The fine preface by Cremer, the introduction on "The origins of chemical engineering" by D. M. Newitt, and chapter 2, "The chemical engineer," by F. H. Garner, should be required reading for all chemical engineering undergraduates. In approximately 58 pages, the contributors and editors give us an excellent survey of the chemical engineering field. The chemical engineer who reads the preface and chapters mentioned will be proud of his profession and will appreciate that it has come of age.

It is difficult to do justice, short of several pages, to the many topics covered in these first two volumes. They include a heterogeneity of subject matter, but this is peculiar to the field of chemical engineering and in no way reflects on the editing. Nevertheless, there is evidence of design in the arrangement of material.

Volume 1 deals with economics, material and energy balances, pilot and semicommercial units, and design and operation. There are two valuable appendixes, one on preparation of flow diagrams and the other on units and dimensions. In this volume, seven chapters, including the appendixes, are by British engineers and four, by Dutch engineers. None of the contributors is a teacher, but each qualifies as an expert. The number of problems given in the text, with their solutions, as examples is unusual by American standards. There is a minimum of verbosity. Our teachers appear to take

delight in setting difficult problems, so involved with data and grammar that more time is used in trying to understand what is wanted than in solving the problem, once it is understood. It should be realized that actual plant problems, while often difficult, are at least understood by those who must solve them. Little is gained by making things more difficult than they are, especially if one considers the rapid pace at which technology is developing and the need for keeping up with current developments. The editors and contributors appear to appreciate these points.

The second volume is in two distinct parts. The first deals with fundamental concepts of the solid state and with metallurgy, including powder metallurgy. The second part is concerned with flow principles in porous masses. A short final chapter on transpiration cooling seems out of place. Again, all but one of the contributors are British and Dutch practicing chemical engineers. The material presented is pertinent, clearly written, and carefully edited. It is significant that in this volume, as in the first, there is no "eruption" of g_c 's for conversion of mass to force units, so characteristic of American textbooks. So long as units are self-consistent and stated, there is really no reason for the intense devotion we exhibit toward this symbol.

Altogether, if the remaining ten volumes follow the pattern of the first two in excellence, *Chemical Engineering Practice* will become an indispensable encyclopedia for all practicing chemical engineers and teachers.

J. M. DALLAVALLE
Georgia Institute of Technology

Wire Brush Surgery. In the treatment of certain cosmetic defects and diseases of the skin. James W. Burks, Jr. Thomas, Springfield, Ill., 1956. 154 pp. Illus. \$6.75.

The publisher has made this monograph available at an opportune time, when interest in dermabrasive techniques of removing scars and cosmetic defects is keen. This is the first book to be published on the wire-brush method of der-

mal planing, a special surgical technique of which dermatologists are making increased use.

James Burks covers thoroughly the development of this type of dermabrasion, its indications and contraindications, the selection of patients and sites, psychological considerations, the histology of superficial freezing and of epidermal regeneration, pre- and postoperative management, equipment and refrigerating agents, technique, results and complications, and the handling of special problems.

The text contains sufficient detail on all aspects of wire-brush planing to serve as an excellent primer on the technique and on the fundamentals of the basic sciences underlying the procedure. Chapter II, on anatomical considerations, and chapter III, on histological changes during postoperative healing, are outstanding. The author acknowledges the contribution of Wallace Clark in the preparation of the latter section. Detail in the illustrations of technical procedure, operating-room layout, and equipment, is excellent.

The little volume is concisely written and well documented. Responsible for this, in part, is Lois DeBailey, medical editor, who assisted in its preparation, and to whom the author gives due credit. The monograph is based on the personal experience of Burks in 750 cases and on material used by him in a course of instruction at Tulane University and the Louisiana School of Medicine.

LEON H. WARREN
Parke, Davis and Company

Population Genetics: the Nature and Causes of Genetic Variability in Populations. vol. XX of *Cold Spring Harbor Symposia on Quantitative Biology*. Biological Laboratory, Cold Spring Harbor, N.Y., 1955. xvi + 346 pp. Illus. \$8.

Readers of the previous 19 volumes of this series do not have to be told of the high standard which the papers of each symposium invariably attain. Readers not familiar with the series will probably include those who are especially interested in the particular subject of the 20th symposium. This subject, population genetics, although perhaps without much appeal to the general public as yet, is one of tremendous importance and one in which enormous advances have recently been made. Geneticists, plant and animal breeders, and anthropologists, alike, can no longer afford to neglect this field.

The present volume is unusual in that it begins with a series of eight papers,

of various degrees of difficulty, on the mathematical and quantitative aspects of population genetics, including an impressive contribution by the young Japanese Motoo Kimura. Following these two sections are others on selection in plants, selection in animals, genetic variability and polymorphism, populations in time and space, and the integration of genotypes. The whole is preceded by a masterly introduction by Dobzhansky and followed by a fine summary by Lerner.

It is hopeless to attempt a full summary of the contents. Instead, let me merely mention two subjects, the importance of which for human evolution has only recently been realized, which are well presented. These are rapid evolution (by E. B. Ford) and polymorphism in man (by A. Allison).

This volume is a must for all those interested in population genetics, human evolution, anthropology, or any one of a number of other disciplines. Like the other volumes, it is well printed on good paper, and there is an index.

WILLIAM C. BOYD

Boston University School of Medicine

The Future of Arid Lands. Papers and recommendations from the International Arid Lands Meeting. Gilbert F. White, Ed. American Association for the Advancement of Science, Washington, D.C., 1956. 453 pp. Illus. \$5.75, members; \$6.75, others.

Of the earth's 52 million square miles of land surface, about 35 percent, or more than 18 million square miles, are in the arid or semiarid zone. Just to administer such an area would present problems. Added to the normal problems, others resulting from the climatic, economic, and social instability inherent in the arid regions greatly complicate the government of more than one-third of the earth. Just how complicated the situation is, is discussed in *The Future of Arid Lands*.

This book is a symposium comprising the 31 papers and three statements presented at the International Arid Land Meetings in Socorro, N.M., during April and May, 1955. Scientists from 17 countries participated. The meetings were held under the auspices of the AAAS, with support from UNESCO, the National Science Foundation, and the Rockefeller Foundation.

The papers read at the meetings were prepared in an attempt to answer, or at least to discuss, specific questions: What is the future of the arid lands? Is there any way we can either predict or modify the variability of water supply? Can we utilize the arid lands permanently? Are there sources of water now unused which

may be tapped in the future? Can we find or develop plants and animals better adapted to arid conditions?

The tenor of the discussion is well stated by H. O. Sternberg of Brazil: "It is hard enough to develop a system of land use which fully considers ordinary conditions; to contend with unusual circumstances really calls for additional determination, organization, skills and capital." Insofar as answers to the specific questions are concerned, there seemed to be considerable doubt about what might be accomplished.

It is generally agreed that there is little hope of long-range prediction of amounts of precipitation in arid regions, and that there are no distinct drouth cycles. To judge from the reported experience of those working on arid lands in Africa, there is little to be expected from groundwater development. Ground water is too hard to find and, when found, may be too salty.

Throughout the symposium the distinction is made between "oasis" development and land use under local precipitation. Oasis development is dependent on the importation of water from a more humid area. Thus, in an arid region, the extent of development is dependent on the water supply, not on the availability of lands. There appear to be differences of opinion on the objectives of irrigated-land use. C. E. Kellogg, of the United States, thinks that crops grown on irrigated land should be restricted to those which would aid the economy of the surrounding dry-land area. Other authors indicate that the greatest returns from irrigation come from the production of specialty crops which cannot be grown in some seasons in humid areas.

There is much lack of agreement on the best utilization of arid and semiarid land without irrigation. J. Tixeront, of Tunisia, points out that the lack of water and the variability of the climate have numerous economic, social, and political consequences and concludes that nomadism is, therefore, obligatory for complete utilization of very arid areas. His conclusion that the arid regions cannot exist by themselves can be viewed in two ways—a justification for the domination of arid regions by their more fortunately watered neighbors or a realistic evaluation of the need for subsidy to arid regions. (Our own arid West under the present drouth is one example.) If true, this dependence must act as an automatic brake on the drive toward nationalism of some of the Near East nations so much in the news today.

The attitude of the technicians in the many fields represented at the conference is of great interest to me. The meteorologist insists that we cannot solve the arid-land problem without a thorough knowledge of meteorology. Likewise, the soil

scientist. The geologist stresses the need for a thorough knowledge of his subject in a search for ground water, and the hydrologist is dismayed at the lack of information relating rainfall and runoff—even more dismayed at the difficulty in collecting adequate data.

No doubt there is much to be said for the modern scientific approach to a solution of land-use problems in the arid regions. But H. L. Shantz, of the United States, reports that olive culture, when practiced as it was in Roman times, is successful today. Frank Dixey, of the United Kingdom, cites instances which indicate that ancient peoples had a precise knowledge of the ground water in North Africa. Pedro Armillas, of Mexico, relates in some detail how archeological studies have shown a high degree of development of arid and semiarid land in pre-Columbian America. E. Evenari and Koller, of Israel, make the following statement: "It is thrilling to see time and time again how the present-day dispositions of highly complex irrigation systems, calculated by trained specialists, with the latest technical aids, coincide with remnants of ancient irrigation systems on the same spot."

The question immediately arises, who were the scientists in those days? If there were none, why were these ancient peoples reasonably successful? Is our real problem the need to know the smallest details of each technique and to collect a measurement of each physical phenomenon? The Roman experience seems to be that, under certain circumstances, the problems of climate can be overcome, to a considerable extent, by reasonable observation of physical conditions and the free application of common sense.

But the other face of the coin was presented by R. O. Whyte, of the Rome staff of the U.N. Food and Agriculture Organization, who argued that much of today's desert area is man-made. This conclusion follows the assumption, also made by others, that there has been no climatic change. Thus, those areas which do not now support agriculture, despite indications of having once done so, are considered to be the results of man's misuse of land.

Almost every participant in the conference warned of the danger of misuse of arid land. This point was emphasized by C. Luker and R. Price of the United States. Nevertheless, there was no agreement about whether there had been major swings in climatic conditions and no agreement on the basic phenomena which control the erosion problem.

Participants in the conference held little hope that there would be new sources of water, either from demineralization of saline waters or from increased precipitation. On the other hand, considerable optimism was expressed concern-