Book Reviews

Graphics in Engineering and Science. A. S. Levens. Wiley, New York; Chapman & Hall, London, 1954. viii + 696 pp. Illus. $7.

Graphics in Engineering and Science is unique in that it embraces in one volume three distinct aspects of graphical expression. The author has, therefore, properly divided the book into three parts. Part I deals with the fundamental principles of projection, or what may be termed the grammar of graphical language; part 2, on drawing practices, shows methods of expression in that language; part 3 is concerned with the coordination of graphics with the language of symbols in the solution of problems in mathematics and physics. It is felt that the book can best be reviewed by treating the three divisions separately.

Part I, "Fundamentals and applications of orthogonal projection," consists of material that in general may be found in any modern textbook on descriptive geometry. The nomenclature has been modernized so that it is almost completely divorced from Mongean terminology. The author has perhaps gone too far in this direction. For example, the terms *grade* and *bearing* used in defining lines, are not too fitting when they are applied to problems in machine design.

The treatment of visibility as a separate chapter (chap. 6) is excellent. The importance of reading is not emphasized enough in most textbooks.

There is not enough space devoted to problems in rotation about line axes. The use of supplementary projections on two adjacent coordinate planes is not always practical from the standpoint of working space. A solution by means of a rotation and perhaps one supplementary plane may be completely satisfactory and occupy far less space.

In part 2, "Technical drawing practices," the presentation, illustrations, and exercises are good. The material conforms to the most modern A.S.A. standards and practices. Sections, conventions, thread forms, fasteners, cams, and gears are admirably presented. There is adequate space devoted to dimensioning. The treatment of limit dimensioning is particularly well handled.

In part 3, "Graphical solutions and computations," Levens performs a distinct service in pointing up the value of graphical solutions to various types of problems encountered by engineers. The explanations of charts and nomographs and methods of setting up graphic scales for the solution of mathematical equations are succinctly and lucidly expressed.

The force diagrams in the chapter on "Graphic statics" are exceptionally good. The use of orthogonal projection in the solution of concurrent noncoplanar force systems is very well presented.

Not the least valuable section of Levens' book is the large appendix with its wide range of factual material and its carefully selected bibliography.

Graphics in Engineering and Science goes beyond its basic function as a textbook for college courses. It has an important function as a reference book in practical design and research.

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The Genus **Euglena.** Mary Gojdics. Univ. of Wisconsin Press, Madison, 1953. 268 pp. Illus. $6.50.

Mary Gojdics' monograph meets a need long felt by students of the genus *Euglena*. It includes a general discussion of the morphology and cytology of the genus, an artificial key to the species, a description of each species with original drawings by the author or reproductions of illustrations from original descriptions of the species, an annotated check list, and a complete bibliography to the taxonomy. The annotated check list of *Euglena* and citations to the literature are significant contributions to workers in the field, new and old.

The key to the species, based on the characteristics of the chloroplasts, is well thought out but, as in the case of most keys, it will be effective only in the hands of the expert. Cytologic procedures are often necessary before the chloroplast structure can be discerned. The initiate in protozoology or algology will be able to use the descriptions and illustrations for species identification.

The author has been effective in fusing her observations with those described by others. Her interpretations appear to be valid in light of the present literature. Future publication will undoubtedly clarify some of the cases of speciation and synonymy discussed.

A second monograph on the physiology of the genus and its taxonomic implications is needed. Until this appears, the present morphologically centered work is a fitting and an excellent initiation to our present knowledge of the taxonomy of the group and a noteworthy contribution to the field.

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Artificial Fibres. R. W. Moncrieff. Wiley, New York, ed. 2, 1954. xii + 455 pp. Illus. $6.

The author is well known for his achievements in the synthetic fiber field and for his wide experience. The book, now in its second edition, attempts to introduce the outsider to the fundamental and technologic aspects of "artificial" fibers—that is, fibers prepared by man from natural or synthetic polymers. At the same time, some technologic information of interest to the specialist is offered. In spite of such conflicting tendencies, Moncrieff has solved the problem in a very competent manner. He has succeeded in presenting clearly

the results of one of the most important branches of polymer chemistry and their practical application in the textile industry.

The book comprises five parts, subdivided into 37 chapters. The first part deals briefly with the fundamentals of fiber structures and serves as an introduction to the problems involved in fiber formation. Parts II and III describe fibers based on natural polymers (cellulose, alginates, and proteins). Part IV covers the truly synthetic fiber types (polyamides, polyesters, polyurethanes, vinyl, and acrylic fibers) as well as glass and coated fibers. The last part contains in condensed form some information on processing, including its analytic and economic aspects.

Moncrieff had to deal with a complex, widely branched field in which some technical information is withheld by the manufacturing interests involved. In a few instances, he has attempted to lift the veil by doing some guesswork. Although he was not particularly successful in some cases (for example, composition and melt spinning of an acrylic fiber, pp. 327–9), in other cases his predictions have proved to be correct (for example, elimination of fibrillation in another acrylic fiber, p. 326).

The book is well printed and contains literature references at the end of each chapter. The addition of an author index would be welcome. The present index does not contain all the authors' names.

Artificial Fibres can be warmly recommended to the student. The specialist will find it a valuable reference.

FRANK J. SODAY

The Chemstrand Corporation

Diagnosis and Improvement of Saline and Alkali Soils. U.S. Salinity Laboratory Staff; L. A. Richards, Ed. U.S. Dept. of Agriculture, Washington, D.C., rev. ed., 1954. vii + 160 pp. Illus. $2. (Order from Supt. of Documents, GPO, Washington 25, D.C.)

This is an enlarged, printed, hard-cover revision of the 1947 multilithed edition. It is written for the professional agricultural worker and provides an excellent discussion of the major problems associated with the characterization, improvement, and management of alkali soils for crop production. The first five chapters provide a basis for the evaluation and interpretation of measurements. Chapters 6, 7, and 8 present procedures and measuring methods in use at the U.S. Salinity Laboratory. No attempt is made to present methods from other sources, irrespective of their suitability. In many cases the handbook covers alternate methods of analysis, and the worker can select from these, depending on the equipment available and the accuracy of results desired. Each description of a method of analysis includes, when applicable, sections on apparatus or equipment, reagents, procedures, remarks, calculations, and references. More than 100 separate methods are discussed under the broad headings of soil characterization, plant culture and plant analysis, and analysis of irrigation water. Diagrams and charts are used extensively throughout. Although the publication deals specifically with alkali soils and the problems related to their use, the methods of analysis are applicable for broad use in the fields of soil chemistry and physics, plant physiology, and drainage engineering.

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Catalysis. vol. I. *Fundamental Principles* (pt. I). Paul H. Emmett, Ed. Reinhold, New York, 1954. 394 pp. Illus. $10.

In the past catalysis has been an important art, but within the last 30 years it has acquired a coating of scientific luster composed of all the research tools of science. The present series attempts to record in orderly fashion what is now known in regard to theory and practice. The chapter titles in order are "Physical adsorption," by Herman E. Ries, Jr.; "Measurement of the surface area of solid catalysts," by Paul H. Emmett; "Chemisorption," "Kinetic laws in surface catalysis," and "The absolute rates of surface reactions," all by Keith J. Laidler; "Catalyst carriers, promoters, accelerators, poisons, and inhibitors," by W. B. Innes; "Catalyst preparation," by F. G. Ciapetta and C. J. Plank; "Magnetism and catalysis," by P. W. Selwood.

The first two chapters give a pithy and well-organized résumé that will be useful to anyone interested in the subject. On reading chapters 3 and 4, I was struck by how much was accomplished by I. Langmuir in 1918, how his principal ideas still dominate the field, and how few new ideas about fundamental physical pictures have since been presented, even though the basic theory now appears in more erudite terms. Chapters 4 and 5 contain little that has not been previously explored in detail in many books.

One wonders if the dressing up of kinetic equations in terms of partition functions represents a real advance when, in the present state of knowledge, the component factors either have to be assumed or depend upon measurement of quantities that occur in the simpler forms.

Chapters 6 and 7 furnish much practical information on the morphology of catalysts and their preparation. Although reaction rates are markedly insensitive to magnetic influences as opposed to electrostatic influences, nevertheless, magnetic susceptibilities often do give information in respect to state of oxidation of the catalyst that cannot be obtained in any other way. The importance of magnetic analysis is just beginning to emerge.

My chief regret is that the editor did not write some of these chapters himself. A better result would have been obtained.

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