therefore, that Dr. T. E. Wallis has produced a volume which maintains this tradition as regards pharmacognosy, following as he does the example of the late Prof. H. G. Greenish.

It is interesting to trace the development of this subject, during the past five decades, under these two men, both of whom have had a large share in establishing pharmacognosy in Great Britain on firm foundations as an important applied science. Dr. Wallis's influence is particularly seen in the appropriate monographs on drugs in the British Pharmacopœia and the British Pharmaceutical Codex. Greenish first published his "Introduction to the Study of Materia Medica" in 1899. The sixth and last edition, entitled "A Text-Book in Pharmacognosy", appeared in 1933 and embodied the changes in the revised British Pharmacopœia of 1932. This was the standard text-book in Great Britain over this period. Meanwhile Dr. Wallis, who had become more directly responsible for the teaching of pharmacognosy at "The Square", published a "Practical Pharmacognosy" in 1925. The fourth and last edition was published in 1943. First under Greenish, then independently, Wallis has exerted considerable influence on the concept of pharmacognosy, whether for the requirements of the Pharmaceutical Society's qualifying examinations or for the training of students in this subject.

Synchronizing as it does with his retirement from active teaching, we may assume that Dr. Wallis's text-book represents his mature views on pharmacognosy. Its scope is great and varied, and yet the ground is covered with that meticulous care for correctness of detail so characteristic of the man. His wide range of knowledge of plant and animal organisms and their products is most impressive. Every aspect of the subject is thoroughly explored and presented with a wealth of illustration which makes the subject-matter both interesting and instructive. Recent research and present trends in research are included. Contributions to research by Dr. Wallis and his school have been largely in the field of quantitative microscopy, in the devising and extending of methods for estimating amounts of admixture and sophistication in powdered drugs, so as to ensure conformity to legal requirements.

Dr. Wallis's classification of the subject-matter is based upon some fundamental characteristics which bring drugs into large groups each having some particular feature in common. Morphologically similar plant organs or tissues are grouped together, such as woods, barks and galls, leaves, flowers, etc. Plant products, extracts, etc., are grouped according to their nature into gums and saccharine substances; resins, gum-resins and oleo-resins; fixed oils, fats and waxes; and so forth. For teacher and student this arrangement has distinct advantages. Discussions of general principles are deferred to the end of the book. It is doubtful if all teachers of pharmacognosy will agree with the order of arrangement of the material. It must be remembered that many students entering a course in pharmacognosy have only had training of the standard laid down by the syllabus for the Pharmaceutical Society's Intermediate Examination. The reviewer feels, therefore, that to introduce the detailed histology of woods and barks near the beginning of the book is to expect rather much from such students.

Several minor corrections will need to be made when the text-book is revised. For example, it will be noted that a number of specific names starting with capital letters in the text have small letters in the captions to figures and in the index. Thus, Figs. 124 and 125 and also the index have *Datura stramonium*, the text *D. Stramonium*. The reviewer ventures to suggest that the author also includes available stomatal index numbers along with his other criteria in his descriptions of the respective drugs.

The text-book supplies much valuable information and carries with it the authority of a careful investigator and an experienced teacher. It is to be strongly recommended to teachers, students and all who are interested, directly or indirectly. His many friends hope that Dr. Wallis, in his retirement, will long be spared to maintain his vital interest in a subject he has made peculiarly his own, and will continue to give guidance and counsel to those who may be called upon to shape its further development and progress.

The publishers are to be congratulated on a work of high merit, even though still limited by Government austerity regulations. It would have been an advantage, however, if the text-book and Wallis's companion volume, "Practical Pharmacognosy", could have been made to conform in size.

W. O. HOWARTH

FUEL PRACTICE

Fuels, Combustion and Furnaces

By Prof. John Griswold. (McGraw-Hill Chemical Engineering Series.) Pp. vii+496. (New York and London: McGraw-Hill Book Co., Inc., 1946.) 27*s*. 6*d*.

THE reader of this book can scarcely fail to notice how technical literature has developed during the past generation. Books used by students formerly were mainly descriptive. This applied to fuel technology—a subject amenable in part to considerable quantitative physical treatment. It includes industrial operations involving chemical reactions on the largest scale and of the greatest intensity. Indeed, some of these were used by the early pioneers in their studies of thermodynamic principles. It is not surprising that in time writers found it necessary, in the interpretation of technical processes, to use modern physical chemistry. In the United States, Haslam and Russell in 1926 produced their book on "Fuels and Their Combustion", which gave to many students the first approach of this kind. Since then developments in practice have taken place, and more particularly in petroleum technology. This deals in the main with liquid materials. These lend themselves especially to physical treatment, which is reflected by several chapters in this book by Griswold. While giving an account of fuel practice, at any rate of American practice, it is sprinkled throughout with references to modern physico-chemical theory. This should be advantageous to many students who find difficult the same approach by way of text-books of abstract theory. There are many who would find the grasp easier when theory is associated with industrial processes.

In conclusion, one can say that the author has realized the aim of his preface, "to satisfy the need for an up-to-date chemical engineering text in this important field. It is the first attempt since that of Haslam and Russell twenty years ago to bring together an essentially fundamental background with developments in both theory and practice."

H. J. HODSMAN