REVIEWS.

MONOGRAPHS ON INDUSTRIAL CHEMISTRY. THE NATURAL ORGANIC COLOURING MATTERS. By A. G. PERKIN and A. E. EVEREST. Pp. 655. London: Longmans, Green and Co., 1918. Price 28s. net.

The authorship of this book is a guarantee that the subject will be treated in a clear and comprehensive manner, and prospective readers will not find their confidence misplaced. Ample justification for the appearance of such a work at the present moment lies in the fact that natural dyes have recently enjoyed an Indian summer of prosperity, owing to the scramble for artificial colouring-matters occasioned by the war, and although, if regarded solely from a technical standpoint, it is impossible to dissociate the treatise from the character of an obituary notice, the subject itself is by no means moribund, because a great variety of chemical and biochemical problems are suggested by it, and demand solution. Consequently, the volume may be recommended as an exhaustive and authoritative compendium of accumulated knowledge, having the added virtue of a stimulus to fresh investigations.

Arrangement of the contents has been made according to the chemical constitution, when this is known, of the principal tinctorial components obtainable from the dyestuffs, and pursues the following order: Anthraquinone, naphthaquinone, benzophenone, xanthone, flavone, chalkone and flavanone, flavonol, γ-pyran, dihydropyran, α-pyrone or coumarin, dicinnamoylmethane, diphenyldimethylolid, tannins, coumarane, indole, lichens, and *iso*quinoline, succeeded by chapters on colouring-matters of unknown constitution, and lakes from vegetable colouring-matters. Plants containing members of two distinct groups, such as those derived from flavone and anthraquinone, are discussed under whichever heading appears the more appropriate.

Although a very large proportion of the material collected is necessarily historical, the recent work of Willstaetter and his collaborators on blossom-pigments receives well-merited attention, more than one hundred pages being devoted to this highly attractive subject; the contributions made by Dr. Everest in this province have doubtless assisted the authors in rendering the division a very valuable one. Similar excellence may be noted in connection with the treatment of brazilin, hæmatoxylin, the tannins, and indigo, although, in reference to the last named, there has been omitted from the list of syntheses that one which, very probably, has a technical importance at least equal to that of the phenylglycine process—namely, the fusion of hydroxyethylaniline with potash; this omission is the more remarkable as the method was patented as long ago as 1906, and is to be found in a textbook appearing in 1913.

It is to be regretted that the value of an admirable treatise is diminished by an inadequate index, of which the threadbare simplicity can scarcely be justified, even as a war economy. No doubt indexing, to most authors, resembles washing in Jordan to Naaman the Syrian; but whilst the present work is crowded with interesting

material, much of it must remain unappreciated for the reason indicated. The authors appear to have adopted the principle of excluding the names of common organic substances, although these arise on every hand from the degradation of natural colouring-matters. For instance, twenty references to phloroglucinol may be found in the text without elaborate research, and yet phloroglucinol does not occur in the index, which is equally innocent of acetophenone, aniline, benzaldehyde, phthalic acid, protocatechuic acid, pyrogallol, resorcinol, salicylic acid, and others involved in syntheses or analyses of the materials described. Again, pp. 529 to 542 comprise hundreds of lichens associated with the acids and other compounds obtainable from them, but the names of the lichens and the associated substances do not appear in the index. Whilst it cannot be denied that the labour involved would be both considerable and uninteresting, it is equally certain that the value of the treatise would be very much enhanced thereby. These remarks are not offered in a spirit of captious criticism, but solely in the hope that a second edition may rectify the only obvious fault in a work of sterling merit. M. O. Forster.

Petroleum Refining. By Andrew Campbell. Pp. xv + 297. London: Charles Griffin and Co., Ltd., 1918. Price 25s. net.

This book has been published at a most suitable time. The enormous importance of the petroleum industry has been forced home to us by the tragedy of the war—in fact, without fuel oils and motor spirit we could not have won the war. This book deals with petroleum refining, and is, we believe, the first book devoted solely to the subject. One very important feature of the book is the inclusion of laboratory methods of analysis, and this feature of the book makes it of very great value to the oil chemist. Mr. Campbell's particular knowledge of refining enables him to write with authority, and his style is lucid and clear.

The book commences with a description of the methods employed for examining the crude oil. The usual physical and chemical processes are described, and there is nothing particularly novel here, except a detailed description of the modified method of Dunstan and Thole for estimating sulphur by the lamp method. Mr. Campbell rightly recommends the employment of the bomb calorimeter for testing heavy oils, but the lamp for distillates such as motor spirit, benzol, and kerosine.

In order to obtain data for a complete refining process, the author distills the crude oil in a 5-gallon still fitted with superheater and arrangement for connecting with a vacuum pump in case the oil is inclined to crack when subjected to high temperature. We wish that the author would not use the term "benzine" for the lowest fraction obtained when fractionating. The names benzene and benzine are so frequently used by those who do not understand the difference between the two classes of hydrocarbon. It would probably be better to call the lowest fraction gasoline or spirit, as this would prevent any misunderstanding.

The description of the chemical and physical properties of oils, paraffin wax, asphalt, etc., is clear and lucid, and consequently this book will be a necessary reference to all laboratories in which these substances are tested. Apart, however,

from the analytical side, the book has great technical interest, owing to the interesting manner in which the refining plant for oils is dealt with.

Chapter VI., dealing with candle manufacture, will be of interest even to the non-technical reader. To chemical readers, after the chapter on analytical processes. Chapter VII., dealing with chemical treatments, is of particular interest.

The book is lavishly illustrated, there being no fewer than 138 drawings. It gives us pleasure to heartily recommend it as being one by an author who is thoroughly conversant with his subject and who writes with the knowledge of practical experience.

F. M. PERKIN.

SURFACE TENSION AND SURFACE ENERGY AND THEIR INFLUENCE ON CHEMICAL PHENOMENA. By R. S. WILLOWS and E. HATSCHEK. Second Edition. Pp. viii + 115. London: J. and A. Churchill, 1919. Price 4s. 6d. net.

We are glad to see that the demand for this little book has been sufficient to call for a second edition, for it gives a clear and conscientious account of the subject treated. The most important of the fresh matter introduced is a new chapter dealing mainly with certain commercial processes in which surface phenomena play an important part. In this chapter attention is first called to the way in which the formation of emulsions is governed by the tendency to form systems which involve a minimum of surface energy, and then to the consequent explanation of the possibility of the reversal of an oil-water emulsion into a water-oil emulsion by the suitable selection of the solids which, added in small quantities, form a film round the droplets. The electrical double layers at the surface of small particles in liquid are next described, with the application to the dying of fibres, which have their own electric charges, by acid and basic dyes, and to tanning. Finally, reference is made to the separation of finely divided sulphide ores from the gangue by means of the flotation process, which involves many complex factors. It will be seen that this new chapter is of great interest, and sufficient references are given to enable the reader who so desires to follow up the subject.

Various additions in the way of descriptions of work carried out in 1916—*i.e.*, since the first edition—have been made in the body of the book. We may perhaps suggest that a mention of Quincke's interesting theory of the "foam structure" of metals deserves reference where Thompson's work is mentioned. We strongly recommend this book to all who require a brief, well-ordered account of the vast body of work that has been done in recent years on surface phenomena.

E. N. DA C. ANDRADE.

NOTICE.

ARRANGEMENTS have recently been made whereby members of the Society of Public Analysts and other Analytical Chemists may use the Library of the Chemical Society and borrow books under the existing rules. The Library is open on Monday, Wednesday, and Thursday from 10 a.m. to 6 p.m., on Tuesday and Friday from 10 a.m. to 9 p.m., and on Saturday from 10 a.m. to 5 p.m.