REVIEWS.

THE MANUFACTURE, REFINING AND ANALYSIS OF ANIMAL AND VEGETABLE OILS, FATS, AND WAXES, INCLUDING THE MANUFACTURE OF CANDLES, MARGARINE, AND BUTTER. By GEOFFREY MARTIN, D.Sc., Ph.D., F.I.C. London: Crosby, Lockwood and Son. Price 12s. 6d. net.

This volume, despite its somewhat ambitious title, consists of little more than 200 pages, and is stated in the Preface to be written for "practical men, industrial chemists, and manufacturers." The amount of condensation necessary to compress so extensive a subject within such limits is so extreme as seriously to prejudice its practical value. Thus, it is obviously next to hopeless to attempt, as the author does, to describe the manufacture and analysis of butter in five pages, of which two are taken up with tables of tests for colouring matters. Even more futile is it to essay the description of the chemistry and technology of margarine in seven pages, three of which are devoted to trade statistics.

It is a little difficult to see what good end can be served by this species of précis writing, except, indeed, as a popular exposition of the subject for the general reader, which is in this case specifically disclaimed.

One of the defects which arises from this attempt is the lack of coherence and proportion between the various sections of the subject. For example, the chapter on the hydrogenation of oils, occupying some thirty pages, is of quite disproportionate length when compared with the rest of the book. Incidentally the space in question is chiefly taken up with the text of patent specifications, without, in many cases, any accompanying explanatory matter, and without attempt at arrangement or classification. The insertion of chapters on the treatment of waste rags, and the manufacture of fish meal, is surely somewhat irrelevant, especially in view of the exclusion of so much matter of primary importance to the subject.

The portions of the book devoted to the chemistry of the oils and fats are brief and sketchy, and show the patchiness previously mentioned. Further, a good deal of the data appears to have been obtained from obsolete publications. Thus, in the two pages which are all that can apparently be spared to the chemical composition of the oils and fats, the substance *clupanodonic acid*, the characteristic fatty acid of the fish oil group, which was discovered in 1906 by Tsujimoto, is omitted from the table of fatty acids; and, although fish oils are mentioned in many places, there is apparently no reference to this distinguishing component either as fatty acid or as a glyceride.

Such an omission, although greatly to be deplored, might conceivably be due to inadvertence, but, unfortunately, there are not a few similar instances. Thus, the

table on page 4 contains "margaric acid," long ago shown to be a eutectic mixture of palmitic and stearic acids, and omits daturic acid, isolated by Meyer and Beer in 1912. Further, cerotic acid is given an odd number of carbon atoms (27 instead of 26), and several fatty acids are included which have never been obtained from natural oils and fats, while elæostearic acid is stated to have the formula $C_{19}H_{30}O_2$, whereas this was shown by Kametaka in 1903 to be erroneous.

In the section on analysis, confined to eleven pages, there are many similar instances of errors and omissions which are even less excusable. On page 151, the specific gravity of beeswax is given as lower than that of palm oil, while, further on, the "titer" of fats is defined as the *melting-point* of their fatty acids—a statement which is incidentally contradicted on the same page.

After all that has been written on the desirability of a uniform temperature for recording the refractive index of oils and fats, resulting in the virtually unanimous agreement of the figure of 40° C. as the most suitable, the statement is made on page 152 that "the refractive index of oils is usually determined at 60° C."

Similarly in the description of the Polenske value—erroneously spelt with an acute accent over the final "e"—one is still directed to "take a few fragments of pumice," notwithstanding that this very statement has been pilloried many times in this journal and elsewhere.

On page 162 are given percentage yields of insoluble bromides from oils without any mention of the conditions under which these were obtained, which, of course, vitally affect the figures. Similarly, the Maumené test is stated to be made with "concentrated sulphuric acid," with no further indication of strength.

In spite of much recent work on the "Valenta test," this is dismissed in two or three lines as a test for butter only, no mention being made of its general application. Further, the strength of the acetic acid on which the temperature figure entirely depends is not mentioned otherwise than as "glacial," which has been shown to be useless as a definition for this test.

In the section on butter, no mention is made of the Kirschner or even of the Polenske test in determining the purity of butter fat, but it is stated that the iodine value is "particularly useful in detecting adulteration with coconut fat."

There are several misprints and other signs of hurried proof correction, but these are of small moment compared with the foregoing inaccuracies.

Although, therefore, the book may present features of interest to the technical reader, it is scarcely possible to recommend it from the chemical and analytical standpoint.

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DICTIONARY OF EXPLOSIVES. By ARTHUR MARSHALL. Pp. xiv + 159. London: J. and A. Churchill, 1920. Price 15s. net.

The present volume is Mr. Marshall's third publication on the subject of explosives. It is a careful compilation on the composition, and certain of the properties, of about four hundred explosives. The subject-matter is restricted almost entirely to industrial explosives, which are more or less complex mixtures. The military explosives, which are either single chemical compounds or simple mixtures, are dealt with at length in Mr. Marshall's other works.

Explosives of foreign origin are included, but the explosives described are almost entirely those which are or have been in practical use. The many hundreds which have been proposed, but have failed to pass the test of actual performance, are not mentioned unless of special historical interest.

The dictionary is divided into three sections. The first contains a classification of explosives according to the purposes for which they are intended to be used; the second, which constitutes the principal part of the book, gives short descriptions of the explosives arranged in alphabetical order; and the third section is a list of the separate ingredients, with an indication of the explosives in which each occurs.

Many of the descriptions are necessarily somewhat vague, on account of the reticence of manufacturers to disclose the composition of their products. This is especially noticeable in regard to the American explosives, for many of which the only information available is a statement of the type to which they belong.

Within its somewhat restricted range, the volume contains a large amount of information, and should prove of considerable value as a work of reference. It is well printed, and no typographical errors have been observed. The style of binding is, however, not such as to produce a good impression, and the price seems very high for the size of the book.

W. L. TURNER.