

changes in the number and arrangement of plates; the increasing complication of the ammonite sutures is explained on the same ground. It is pointed out that the multiplication in number of the sinupalliate Lamellibranchiata in Cretaceous time and their further acceleration in company with the Heterodont forms in the Tertiary period correspond with the incoming and continuance of freshwater conditions. In recent times certain Lamellibranch species in the Black Sea and Caspian Sea have wandered into brackish and fresh water, and as a result there is an increase in length of the siphon, a gaping of the shell, and the formation of a mantle-sinus.

The work has been written in the seclusion of an Indian hotel without the immediate advantages of close contact with the scientific world and its literature. This explains to a great extent the semi-popular nature of the book, and accounts, perhaps, for the omission of a bibliography other than rare and general references in the text. A division into chapters and the inclusion of a more extensive index would have been a decided improvement. Although controversial in many of its statements, the contribution has the undoubted merit of arousing interest and thought. The author appears to be a strong believer in the inheritance of acquired characteristics, and is not inclined to the assumption of an indwelling tendency towards perfection in forms of life; the followers of Cope, von Baer, Naegeli, and von Eimer would, therefore, find much material for debate. The statement that land or fresh-water animals and plants older than of Tertiary age are not found in the earth clefts of primary and secondary formations is certainly erroneous. For instance, the teeth of *Microlestes* found by Charles Moore and submitted to Owen in 1858 came from a Rhaetic breccia filling a fissure in the mountain Limestone, near Frome, Somersetshire.

IVOR THOMAS.

#### COMMERCIAL ORGANIC ANALYSIS.

*Allen's Commercial Organic Analysis*. Edited by Prof. H. Leffmann and W. A. Davis. Vol. II., Fixed Oils, Fats and Waxes, Soap, Glycerol, Cholesterols, &c. Fourth edition, entirely rewritten. Pp. x+520. (London: J. and A. Churchill, 1910.) Price 21s. net.

**M**OST analysts are aware that a fourth edition of Allen's well-known work is in course of preparation. Two of the eight volumes composing the edition have now appeared, and a notice of Vol. I. will be found in *NATURE* of June 16 last. Two more are announced for publication this year, and the remaining four are promised without undue delay. The plan of having both an American and an English editor has been adopted, and articles are contributed by writers from each side of the Atlantic. This seems a sensible arrangement, as with comparatively little modification the book is made to serve the needs of chemists in both countries.

The volume now under review is much extended and improved as compared with its predecessor of the last edition. Mr. C. A. Mitchell is responsible for the opening section describing the general properties

of the fixed oils and fats, as well as the common processes of analysis, whilst the special characters of the individual products, and the particular methods of examining them, are discussed by Mr. L. Archbutt. Having regard to the scope of the book, both sections appear to be very well done. As much trustworthy information as could well be given in the space allotted will be found in these two sections, and no point of importance calling for adverse remark has been noticed by the present writer in looking through a number of representative pages. Perhaps the articles on arachis oil, olive oil, and the beeswax group may be singled out as good examples of compressed essentials. Sometimes, indeed, the compression is a trifle too marked. Many references, however, are given to original papers, so that fuller details can often be obtained.

Certain products, including butter, soap, and glycerol, are each given a special section. Messrs. Revis and Bolton have taken charge of the chapter on butter fat. They have studied their subject well, and, among other things, have grasped a fact which seems to have puzzled some experts on butter analysis—namely, that the addition of lard to butter may produce a distinct (apparent) increase of the "Polenske figure," which might be taken by the unwary as indicating the presence of cocoanut oil. One or two small errors have crept in; thus the Zeiss values in the first table on p. 290 are wrongly given as being taken at 40° C. instead of 45°, and there are two misprints in the second table on the same page. A favourable opinion, based upon the authors' own experiments, is expressed in reference to Lallemand's "barium saponification" method of examining butter fat. How far the commendation is deserved cannot be judged from the particulars given. For example, granted that the method detects cocoanut oil in butter, it may yet be that the detection could be made just as certainly and much more readily by older processes. The really difficult problem is the recognition of lard or beef-fat when present in butter, and it is in the promise of this that the chief importance of Lallemand's process lies. It will be interesting to see how it stands the test of experience when applied, on a sufficiently extended scale, to genuine butter having Reichert-Wollny values in the region of 23 and 24.

Of Prof. Leffmann's chapter on soaps and the other special contributions it must suffice to note that they contain all that an analyst will generally require to know on the subjects. They help to make the volume a distinct improvement upon the former editions.

C. S.

#### THE SEVEN LAMPS OF BIOLOGY.

*Das System der Biologie in Forschung und Lehre. Eine historisch-kritische Studie*. By Dr. Phil. S. Tschulok, Zürich. Pp. x+409. (Jena: Gustav Fischer, 1910.) Price 9 marks.

**T**HE author discusses at great length some of the attempts that have been made to define the scope of biology, and to indicate the logical sub-divisions of the science. Starting with early workers like Ray,