

staff of a hospital, who alone would perform the operation, with, in many cases, the work of a newly qualified house-surgeon.

In many respects the book fills a gap in medical literature, and will be of great help not only to the general body of medical workers, but also more particularly to those who are specially engaged in this line of work.

THE OIL-HARDENING INDUSTRY.

The Hydrogenation of Oils: Catalysers and Catalysis and the Generation of Hydrogen and Oxygen. By Carleton Ellis. Second edition, thoroughly revised and enlarged. Pp. xvii+767. (London: Constable and Co., Ltd., 1919.) Price 36s. net.

"FAT hardening" and "hydrogenation" are the trade terms for the chemical process of saturating liquid oils with hydrogen in presence of finely divided nickel. These operations, which a few years ago were conducted with great secrecy, are now regarded as more or less normal in every soap factory, and the usual extensive literature has grown up to describe them. Much of this is naturally diffuse, and much again inaccurate, so that there was ample room for an authoritative book on the subject. This was provided by Carleton Ellis in 1914, but since its publication the strides made in the oil-hardening industry have been very great, making a second edition, which endeavours to bring the subject up to date and offers suggestions of future possibilities, more than welcome.

The book has now swollen to 700 pages, and is replete with information; it is essentially a work of reference for the expert, and necessarily filled with far too much detail to be easily readable by chemists in general.

The first edition, reviewed in *NATURE* of May 20, 1915, deservedly established a very high reputation for the author, which will be enhanced by the new volume. Doubtless this contains the inevitable printer's errors and minor inaccuracies, but we are less concerned to seek for these than to thank the author for his unselfish labours on behalf of his future readers.

The plan followed is first to discuss the methods of hydrogenation in detail, much of the plant being illustrated and full account taken of the patent literature. The next section, occupying more than 150 pages, is devoted to the many aspects of the subject of the activity of the base metals as catalysers. The vexed question as to whether metallic nickel or nickel oxide is the active agent is fully discussed in so far that the opinions and experiments of the protagonists are given at

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length, but the author refrains here, as elsewhere in the book, from giving the reader any lead as to which theory is the more probable. There follows an important chapter on the analytical constants of hydrogenated oils.

Although first introduced for providing hard fats for soap-making, hydrogenation has proved equally applicable to edible oils. As fats naturally fetch a higher price as foodstuffs than as soap-making materials, their technical production in the edible form has been extensively studied. Reference is made to other uses and properties of hardened oils.

The hardening process has also been extended to petroleum, where many new problems arise, which are now described. Not only does crude petroleum contain unsaturated constituents, but these are also formed in some quantity during the cracking processes.

The first stage in any hardening process is the production of hydrogen of the necessary purity and cheapness. A variety of methods for making hydrogen are in practical operation, and still more have been suggested, so that it is not surprising that fully a quarter of the book is devoted to the description of these. In the future the cheap production of hydrogen will play a great part in the formation of ammonia from the air, and through ammonia of nitrates, and so influence increased soil fertility.

The fat-hardening industry has had more than its share of patent litigation, famous cases having been fought both in this country and more recently in America. The report of the English case is given, substantially as published in the British official journal, in an appendix, whilst the case of *The Procter and Gamble Co. v. The Berlin Mills Co.* is reprinted in such detail as to occupy eighty pages.

E. F. A.

POLITICAL SCIENCE.

A New Chapter in the Science of Government. By Benchara Branford. Pp. xlviii+190. (London: Chatto and Windus, 1919.) Price 5s. net.

THIS book is not perhaps likely to become popular. It is defective both in shape and in style; nor is the language of the author free from eccentricity and even ambiguity. It is possible that some reason may be urged for such phrases as "Britamerindian Commonweal" or "Britamerindian re-orientation of politics," in which the author seems to take an especial pleasure. But phrases like "a spiritual instrument of exploration on the rough politico-economic *terra incognita*," or "feeling of communitary responsibility," or "an extension of our synoptical cate-