

strong upper layers of rock into domed or arched forms, relieving the pressure beneath, at least for a time. This view differs widely from the one commonly held, viz. that the underground chambers of lava represent intrusions through the strata on which they rest, and that the pressure of the lava has itself elevated the roof of the chamber. The author ably supports his thesis by many different lines of evidence.

### Textile Technology.

*Textiles.* By Prof. A. F. Barker. With chapters on The Mercerized and Artificial Fibres, and the Dyeing of Textile Materials, by W. M. Gardner; Silk Throwing and Spinning, by R. Snow; The Cotton Industry, by W. H. Cook; The Linen Industry, by F. Bradbury. (Westminster Series.) Revised edition. Pp. xii + 386. (London: Constable and Co., Ltd., 1922.) 15s.

OF the great trinity of human life's essential needs—food, shelter, and clothing—practically all the articles of clothing, as well as a considerable number of articles for improving the shelter, are derived from textiles. The provision of these and other articles has led to the development of the great textile industries. These industries together form the only serious rival to agriculture for chief place among the industries of the United Kingdom, while they rank supreme in their contribution to the country's exports, of which no less than some 40 per cent. are textiles.

It might be expected, therefore, that a large number of people would be interested either as producers or consumers in such a work as the present, which aims at giving in brief compass an outline of the textile industries in their historical, technical, industrial, and commercial aspects. The book opens with an historical introduction; there follow descriptions of the raw materials and their production, and of the principles and processes of spinning, weaving, designing, and finishing. Later chapters deal with the separate industries in turn, namely, the woollen, worsted, cotton, silk, linen, dress goods, etc., and the carpet industries. On the whole the purpose of the book is successfully achieved. The author rightly emphasises the fact that it is the article finally produced which determines the raw material employed and the processes through which this passes. It is for this reason that he deals first with the general principles of spinning and then with the various preparatory processes, which were developed later chronologically for the purpose of presenting the raw material to the spinning machines in a convenient form. The chapter on spinning, in which are described the modern machines and their relation to the old methods, is the best chapter in the book;

the account of the preparatory processes is somewhat scanty, rather disjointed, and occasionally inaccurate. Improvements might be made in certain other directions. Thus, the descriptions of machines sometimes suffer from the absence of explanation of some of the technical terms used; while the replacement of a number of the illustrative photographs by line drawings would add considerably to the value of the book.

It is to be regretted that there is no uniformity of plan in dealing with the separate industries; each special contributor writes from his own particular point of view, with the result that a recasting of their work would be necessary to preserve the unity of the whole. None of these special chapters compares favourably with Prof. Barker's own contributions in general treatment and the selection of material; and in too many instances the statistics and other information, having remained unchanged from the 1910 edition, are now so out-of-date as to be misleading.

In spite of its deficiencies, however, this work remains probably the best in English affording a general introduction to the study of textile technology, and as such it is to be commended.

### Highway Engineering.

*Les Chaussées modernes.* Par Prof. P. Le Gavrian. (Encyclopédie du Génie Civil et des Travaux Publics.) Pp. 431. (Paris: J.-B. Baillière et Fils, 1922.) 40 francs.

THE publication of this text-book marks another step forward in the evolution of one of the most recent developments of engineering and is therefore to be welcomed. Road engineering in its modern form may be said to be contemporaneous with the motor car, the advent of which has again brought a large portion of the national transport on to the roads after an eclipse which lasted from the decline of the stage coach, or even the Roman period, until the introduction of the internal-combustion engine for road vehicles.

The problem of constructing roads to suit modern traffic has probably been best met in Great Britain, but the task fell to busy men, the engineers to the local government authorities, who have had many other pressing and difficult problems to deal with during the same time. Consequently, the practice which has been developed, although well described in the periodical literature, has not been codified or reduced to the form of text-books, although two small publications by Mr. H. P. Boulnois and Mr. F. Wood have to a certain extent met the want.

France has, however, already established a Chair of Highway Engineering, the first occupant of which is