are varied in character, and formulæ for driving them are numerous, with results that are oftentimes conflicting. A handbook, therefore, which brings together, for comparison, data relating to the varied forms taken by piles and the rules governing their use is a useful *vade mecum* for the engineer.

The author has covered the ground very fairly, and though in some directions, perhaps, his survey might have been amplified with advantage, yet, on the whole, it is reasonably comprehensive. It covers a brief description of timber piles, with notes on their durability and treatment, and then, at greater length, deals with the numerous varieties of reinforced concrete and steel piles, both for bearing and sheeting. There are chapters on pile-driving and the handling of disc and screw piles, followed by an informative section on the theoretical carrying capacity of piles and the stability of walls and cofferdams, in which the mathematical treatment of the subject is well set out. The book concludes with several tabular appendixes and an index. It is well printed, and the illustrations and diagrams are clear.

B. C.

Theory of Alternating Current Wave-Forms

By Philip Kemp. (A Series of Monographs on Electrical Engineering, Vol. 1.) Pp. ix + 218. (London : Chapman and Hall, Ltd., 1934.) 15s. net.

THE invention of the oscillograph enabled electrical engineers to gain a further insight into many curious electrical phenomena. Some of these had been investigated mathematically previously, and in most cases the instrument gave a complete verification of the mathematical theory. The author begins by explaining how a periodic wave can be resolved into its harmonics. He then gives many useful mathematical theorems. He proves, for example, the conditions that the current and voltage waves must fulfil in order that the average power expended may equal the product of the effective volts by the effective amperes.

Several methods are given for harmonic analysis. Some of them assume that the function can be expanded in a finite number of sine and cosine terms having frequencies in the ratio of 1, 2, 3, etc. In fact, they give a method of interpolation that was used by Clairaut and Lagrange seventy years before Fourier published his theorem. We doubt whether it is possible to compute the amplitude of the 25th harmonic when the half base is divided into only twenty-six parts and the ordinates measured. Using Lagrange's solution and applying it to a rectangular wave, we find that the computed value of the amplitude of the eleventh ordinate when the half base is divided into twelve equal parts is only one fifth of the true value. Applying Hardy's rule directly to Fourier's solution in this case, the error in the amplitude of the eleventh harmonic found is less than three per cent. We think that by far the best and least laborious method of finding the amplitudes and the phases of the various harmonics is to apply some of the known methods of graphical integration to Fourier's solutions.

Problems in Electrical Engineering, with Answers

Edited by Prof. S. Parker Smith. Second edition, revised and enlarged. Pp. xiv + 210. (London : Constable and Co., Ltd., 1935.) 5s. net.

A BOOK containing more than a thousand somewhat difficult problems, the answers to which are all given, represents a great deal of labour. It also shows that, to a first approximation, electrical engineering has become an exact science. This book will be a help to all teachers of electrical engineering, especially in their exercise classes. The students attempt the examples which have been set and the teacher goes round the class and helps them individually. The examples are suitable for a three years college or university course. As a guide to the students, the easier examples are marked with an asterisk. We congratulate the editor on having produced such a useful book.

Geography

The Fiord Region of East Greenland

By Louise A. Boyd, with Contributions by J. Harlen Bretz, O. M. Miller, Walter A. Wood, William B. Drew, Charles B. Hitchcock and John K. Wright. (American Geographical Society, Special Publication No. 18.) Pp. xii + 369 + 14 plates. (New York : American Geographical Society, 1935.) 4 dollars.

MISS L. A. BOYD, with the help of the American Geographical Society, organised and led an expedition to the Franz Josef and King Oscar fjord regions of East Greenland in 1933. The primary object was the study of fjord formation. This composite volume gives the important results of the work.

After Miss Boyd's narrative, with much good descriptive work, comes a study of the origin of the fjords by Prof. J. H. Bretz. He finds them to be stream-eroded valleys modified by glacial action, and in only one valley does he find clear evidence of fault action. Post-glacial frost action is very marked but not more on the coast than elsewhere, which possibly may be explained by the constant rising of the land. There is no strand flat in Greenland, but nevertheless Prof. Bretz believes that Nansen's theory of the strand flat formation by the product of wave action and frost action receives some support from Greenland.

The volume contains several new maps, many oceanographical data and a large collection of superb illustrations. A chapter on the botany of the region, as well as Jan Mayen, is important. R. N. R. B.

World Sugar Production and Consumption : an Economic-Geographical Survey

By Dr. C. J. Robertson. Pp. vii + 142. (London : John Bale, Sons and Danielsson, Ltd., 1934.) 5s. net.

DR. ROBERTSON's present association with the International Institute of Agriculture at Rome has ensured an adequate use of statistics in this book whilst his training in the University of London has given it a viewpoint which will render it of considerable value, as a convenient summary, to economists and geographers. After reviewing the general conditions of