ENGINEERING

Airplane Structures

By Prof. Alfred S. Niles and Prof. Joseph S. Newell. Vol. 1. Second edition. Pp. xv+451. Vol. 2. Second edition. Pp. viii+177. 13s. 6d. net. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1938.)

THE revised edition of this book, now expanded into two volumes, attacks the problem of aircraft structural design from the point of view of the designer who may wish to apply the advances that scientific thought have made available to his problem. It discusses all of the methods of design and analysis that have been used successfully, and by the use of illustrative examples endeavours to show the best uses and the limitations of each.

The introductory chapters are devoted to the aerodynamic questions from which the conception of the applied external loadings is derived, and although naturally not complete in their scientific discussions of these problems, they do define them sufficiently to make clear the loadings that the structural designer is called upon to resist. The bridging of this gap has been conspicuously absent from published works hitherto.

The main portion of Volume 1 is then devoted to the various accepted methods of structural analysis, with applications, and includes a chapter on the strengths of methods of joining structural elements together, such as are acceptable in the somewhat peculiar aircraft practice. A very useful chapter on deflection and stiffness treated as a design problem finishes off the first volume.

The second volume contains a discussion of indeterminate structures, and gives many excellently worked out examples occurring in aircraft problems. The treatment of stressed skin structures is the least satisfactory part of this work; but these are problems still in their infancy, and about which controversial views are necessarily held until the correct practices have been established by experience.

In general, it can be said that this is an excellent book for both students and designers. It contains an unusually large number of tables, charts, and such aids to routine design work not always found in textbooks; further, these are set out in a manner calculated to make them of greatest use to the practical designer.

Foundations and Earth Pressures

By C. Hyde Wollaston. Pp. 295. (London: Hutchinson's Scientific and Technical Publications, 1939.) 21s. net.

IN recent years, increasing attention has been given to investigation in that branch of science designated soil mechanics, which deals with the behaviour of soil when treated as a material of construction. An account has been given in the report of the Building Research Board of the advances made in this branch, and it is therefore of especial interest and value to have the views of an engineer as to the methods of putting into practice such information as is available. These have been expressed with clearness and a full force of conviction by C. Hyde Wollaston, late chief engineer in the Public Works Department of Burma. His aim is to bring home to engineers the desirability and importance of treating soils as materials of construction and with the same attention as is given to timber, steel, and concrete.

The author shows that soil mechanics provides a far more reliable and certain guide than is generally supposed, and explains how soil testing should properly be conducted. A clay soil, hitherto the bugbear of engineers, need no longer be regarded with suspicion. Its 'water-content' is now known to be a sure criterion of its strength against compression. In the first part of the book foundations are dealt with, and in the second part the author turns his attention to earth pressures and retaining walls. The practical application of the new ideas on these subjects is exhibited in some fifteen examples which constitute the third part entitled "Designs and Calculations". Here are treated actual designs ranging from a simple column footing to a reinforced concrete retaining wall and calculations of the stability of bridge piers useful both to the student and the practitioner.

MATHEMATICS AND ASTRONOMY

The Theory of Functions

By Prof. E. C. Titchmarsh. Second edition. Pp. x+454. (London: Oxford University Press, 1939.) 25s. net.

THE second edition of Prof. Titchmarsh's "Theory of Functions" has been produced photographically from amended sheets of the first, with the transfer of the main account of the gamma function to the chapter on analytic continuation and the insertion at the end of the chapter on integral functions of two theorems on asymptotic values and an introduction to the theory of meromorphic functions which will send the reader eagerly to Nevanlinna. The list of memoirs consulted is unchanged; the list of books recommended is of a more useful kind than in the first edition, but in an epoch when every weakening of international bonds is to be deplored, we regret that anyone should decide to restrict such a list so far as possible to works in English; the result in this case is that whereas in 1932 a total of 25 titles was composed of 16 in English, 11 in French, 7 in German, and a translation, in 1939 a total of 24 titles includes 19 in English and two translations.

Page numbers have been preserved, at a cost: there is only one page between 255 and 265, and this is numbered 256–64; on the other hand, 284 is followed by seven pages numbered 284a to 284g, and then odd numbers take the left hand and even numbers the right until a blank unnumbered page at the end of the chapter restores the usual location. Since references throughout are to sections, not to pages, the economy seems petty.

The success which this book has achieved proves that Prof. Titchmarsh was right in anticipating that the collection which he describes too modestly at consisting of "rather disconnected introductions to