operators from the point of view of the theory of differential equations of infinite order.

The development centres round the generalized differential operator. Several chapters are devoted to the definition and properties of operators, namely, particular operators, operational multiplication and inversion, grades defined by special operators, etc. Some very interesting examples are given in this section illustrating the application of operational processes. These include such important problems as the development of the disturbing function in planetary motion involving Newcomb operators; the propagation of electromagnetic waves in which Silberstein's elegant operational solution is used, and finally the propagation of population by fission, to which the operational method of Rawles is applied. Chapters vi and vii are devoted to differential equations of infinite order with constant coefficients, and linear systems treated by the Heaviside calculus.

Illuminating chapters then follow on the Laplace type of equation of infinite order, in which the coefficients are polynomials of bounded degree; the generalized Euler equation of infinite order; Fuchsian operators of infinite order, and the Volterra and Fredholm integral equations of infinite order, in which a full description of Lalesco's theory is given. The closing chapter is devoted to the theory of spectra and, after giving some important theorems on matrices concerning transformations, identities and Hermitian, the author proceeds to discuss the equivalence of the theories of quadratic forms and integral equations and, finally, some general considerations on the continuous spectra of quadratic forms.

Throughout the text, which is very clearly written, many applications to science have been indicated, and an extensive bibliography is provided at the end for further reading. Those interested in the subject will be grateful to have, within one cover, so complete an account of the new operational symbolism which has become one of the important methods of extending the domain of mathematical analysis.

F. G. W. B.

A Text-book of Aerodynamics

Elements of Practical Aerodynamics
By Prof. Bradley Jones. Pp. v+398. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1936.) 18*s*. 6*d*. net.

AS the author claims in the preface, this is a student's text-book of American origin, and as such is an admirable exposition of the subject. It gives worked-out examples in the text and further examples for the student at the end of each division. This is a principle that has always been advocated by educationists, but seldom followed by writers of books on aeronautical subjects up to the present day.

The author states, apparently as a recommendation, that he has avoided the use of the calculus except upon two occasions. It is a little surprising to find fear of this branch of mathematics in any modern scientific book, more especially one expressly written for students, who surely must be beyond the study of such elements of it as would have been necessary in such a book before they even reach the stage of studying aerodynamics.

The first few chapters, dealing with the aerodynamics of the aeroplane, are extremely clear and lucid, but they should have been followed by the chapters on stability, control, etc., so as to read as one continuous argument. One would like to have seen more on skin friction, laminar and turbulent flow, and such matters, treated as lucidly as the rest of the aerodynamics in these chapters.

The chapter on stability infers that lateral stability is less difficult a subject than longitudinal stability, a statement with which few aeroplane designers will agree. The mathematical consideration of it in theoretically undisturbed air may be, but this is only the introduction to the real practical problem with disturbed motion.

The second half of the book is made up of accurate, but quite inadequate, chapters on subjects such as materials, instruments, meteorology, 'avigation' (American for aerial navigation) and aerostatics. These are good, so far as they go, but are very elementary in character, and out of balance with the treatment of the subject-matter of the earlier chapters.

In general, this is a book that should appeal to students in Great Britain, to be taken as additional reading, giving a rather different American outlook on the subject. Now that we have adopted the same units as used in the United States, it will be less confusing to the beginner.