PREFACE.

IT may perhaps be fairly stated that no better guide can be found to the analytical developments of Pure Mathematics during the last seventy years than a study of the problems presented by the subject whereof this volume treats. This book is published in the hope that it may be found worthy to form the basis for such study. It is also hoped that the book may be serviceable to those who use it for a first introduction to the subject. And an endeavour has been made to point out what are conceived to be the most artistic ways of formally developing the theory regarded as complete.

The matter is arranged primarily with a view to obtaining perfectly general, and not merely illustrative, theorems, in an order in which they can be immediately utilised for the subsequent theory; particular results, however interesting, or important in special applications, which are not an integral portion of the continuous argument of the book, are introduced only so far as they appeared necessary to explain the general results, mainly in the examples, or are postponed, or are excluded altogether. The sequence and scope of ideas to which this has led will be clear from an examination of the table of Contents.

The methods of Riemann, as far as they are explained in books on the general theory of functions, are provisionally regarded as fundamental; but precise references are given for all results assumed, and great pains have been taken, in the theory of algebraic functions and their integrals, and in the analytic theory of theta functions, to provide for alternative developments of the theory. If it is desired to dispense with Riemann's existence theorems, the theory of algebraic functions may be founded either on the arithmetical ideas introduced by Kronecker and by Dedekind and Weber; or on the quasi-geometrical ideas associated with the theory of adjoint polynomials; while in any case it does not appear to be convenient to avoid reference to either class of ideas. It is believed that, save for some points in the periodicity of Abelian integrals, all that is necessary to the former elementary development will be found in Chapters IV. and VII., in connection with which the reader may consult the recent paper of Hensel, *Acta Mathematica*, XVIII. (1894), and also the papers of Kronecker and of