

PREFACE.



THE International Catalogue of Scientific Literature places Quaternions as one division (83), and Ausdehnungslehre and Vector Analysis as another division (84) of Universal Algebra (8). The proximate divisions on either side are General Theory of Complex Numbers (82) and Matrices (85). These are the main and allied branches of Mathematics comprised in this Bibliography. I have also included publications in which vector ideas and methods are applied.

The contributions of each writer are arranged chronologically, the date taken being that of the volume in which the contribution appears. The mark † is printed before the first posthumous publication.

In the use of contractions for the names of serial publications, I have followed the system of the *Jahrbuch über die Fortschritte der Mathematik*; and I have likewise followed it in avoiding the use of Roman numerals. Where the number of the pages of a book is indicated by the sum of two numbers, the former number refers to the preface, and the latter to the text.

The following contractions are used : M.P. for Collected Mathematical Papers ; S.P. for Collected Scientific Papers ; G.W. for *Gesammelte Werke* ; Pr. for *Programmabhandlung*.

For facilities in the preparation of this Bibliography, I wish to thank the Librarian of the University of Michigan, and, for special assistance, the following members of the Association: Combebiac, Dickstein, van Elfrinkhof, Grassmann, Joly, and Schlegel. Almost every living writer has responded to the request to make the list of his own contributions complete.

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17th November, 1903