THE FOUNDATIONS OF THE EUCLIDIAN GEOMETRY AS VIEWED FROM THE STANDPOINT OF KINEMATICS. DISSERTATION

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Dissertation by Israel Euclid Rabinovitch

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ISRAEL EUCLID RABINOVITCH

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DISSERTATION

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DOCTOR OF PHILOSOPHY

BY

ISRAEL EUCLID RABINOVITCH

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Dedicated

TO

FABIAN FRANKLIN, PH.D.,

FORMERLY PROFESSOR OF MATHEMATICS IN THE JOHNS HOPKINS UNIVERSITY,

In Grateful Acknowledgment

OF BENEFITS CONFERRED UPON THE AUTHOR DURING HIS RESIDENCE IN
BALTIMORE AS A GRADUATE STUDENT OF THE
JOHNS HOPKINS UNIVERSITY.

PREFACE.

THE present work is the result of long meditations and of an earnest search for truth. A conviction that truth in mathematics must be absolute, not admitting of any compromises, and an inmost feeling that Nature is not deceiving us and that She reveals Herself to us in Her true appearance, unmutilated by false logic, have guided me in my endeavors to solve one of the hardest mathematical problems, so intimately connected with the problem of the origin of our ideas, — namely, the problem of the Foundations of Geometry. These meditations were finally written up, in April, 1899, at the prompting of my excellent and highly esteemed friend and benefactor, Dr. Fabian Franklin, formerly Professor of Mathematics in the Johns Hopkins University, to whom I have availed myself of the present opportunity of expressing my gratitude, by inscribing this work to him.

Another name I ought to mention with gratitude is that of Dr. Alexander S. Chessin, Professor of Mathematics in Washington University, who was the first to appreciate the value of this work and to talk to me unreservedly about it, and also to urge me to use it as a thesis for the Ph.D. degree.

And, finally, I owe a duty of gratefulness to my distinguished professor, Dr. Frank Morley, for his guidance in the work of reading up the literature of the subject, for discussing with me points of difficulty in the literature, and also for allowing me to present some of my theorems before the conference of the mathematical seminary of the university, where the general discussion by the audience helped me in improving the mode of presentation of these theorems. To this discussion I owe, in particular, the analytical presentation of my proof that, *with the point as its element*, space must be three-dimensional. The whole of the Introduction was undertaken and carried out, during the academic year of 1900–1901, at the suggestion and under the direction of Professor Morley, and it is intended as a critical review of some of the most important results obtained by modern mathematicians in the subject (Riemann, Beltrami, Lie and Poincaré), so that in the light of these an adequate estimate of the results achieved in this Dissertation might become possible.

And last, but not least, my thanks are due to Professor Edwin R. A. Seligman and Professor Felix Adler of Columbia University for the generous interest they have taken in the publication of my work in full; and also to Mr. Isador Goetz, A.B., of New York City, for his valuable assistance in the revision of the proof-sheets, and to the gentlemen of The New Era Printing Company for the care and efficiency with which the printing of this volume has been executed.

130 Henry Street, New York City,
November, 1903.

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