THE PARABOLA, ELLIPSE AND
HYPERBOLA, TREATED GEOMETRICALLY

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ROBERT WILLIAM GRIFFIN

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BY

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PREFACE.

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Long experience has proved to me that it would be a great practical advantage for the general class of students to acquire a knowledge of even the elementary Geometrical properties of the Parabola, Ellipse, and Hyperbola—a knowledge which may be attained, in a very short time, by any one acquainted with the six Books of Euclid, though many have neither the ability nor the perseverance necessary for the Analytical investigation.

In the following Treatise I have endeavoured to demonstrate, on strictly geometrical principles, the most useful properties of these curves. In the definition of a tangent I have avoided the notion of a limit, adopting, in preference, Euclid's definition; and the demonstrations depending thereon will, I think, be found somewhat new and interesting.

The similar properties of the three curves will be found to be treated in such a manner as to need scarcely any change of either words or notation.

In Chap. III. Proposition XIX. *et seq.* and Corollaries, I have traced the analogy between the properties of conjugate diameters of the Hyperbola, and those of the Ellipse, further than has been done in any other Treatise.

To the Board of Trinity College I owe my grateful thanks, for extending to me that liberal support with which they have ever shown themselves ready to assist the humblest efforts.

<div align="right">ROBERT WM. GRIFFIN.</div>

19, TRINITY COLLEGE,
 September, 1879.

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CHAPTER I.

THE PARABOLA.

DEFINITIONS.

A PARABOLA is the curve traced out by a point, which moves in such a way that its distance from a fixed point is always equal to its perpendicular distance from a fixed right line.

The fixed point is called the *Focus*, and the fixed right line the *Directrix*.

Any right line perpendicular to the Directrix is called a *Diameter*.

The right line drawn through the Focus perpendicular to the directrix is called the *Axis*, and the point at which it meets the curve the *Vertex*.

A right line which meets the curve, and, being produced, does not cut it, is called a *Tangent*.

A right line drawn through any point on the curve perpendicular to the tangent at that point is called a *Normal*.

If a right line be drawn parallel to any tangent, the part intercepted on it, between the curve and a diameter passing through the point of contact of the tangent, is called an *Ordinate* to that diameter.

The part intercepted on any diameter between the ordinate and the curve is called the *Abscissa*.

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