An account of a Book, viz. The Geometrical Key, *or Construction of all* Equations Linear, Quadratic, Cubic *and* Biquadratic, *by a* Circle *and one only Parabole; by Mr.* Tho. Baker *Rector of* Bishop Nympton *in* Devonshire.

The *Analysis* which the *Ancients* used for the constructing *Problems* geometrically or by lines, has been highly advanced by *des Cartes's* method; that part of this method which concerns local *Problems* has been well explained by *de Wit*, but the other and more principal part of constructing *Equations* has been lately cleared by *de la Hire*. Yet neither *des Cartes* nor *de la Hire* do it without the trouble of preparing the *Equation* by taking away the *second Term*. To free us of this trouble our *Author* here shews us to construct all affected *Equations* not exceeding the *4th* power, by the *Intersection* of a *Circle* and *Parabola* without omission or change of any *terms*: And altho by the *Method* of *des Cartes* we may find not only any *Parabola*, but also *Ellipses* and *Hyperbola's* to construct these *Equations*, yet of all lines of the first kind a Circle and *Parabola* being the most simple, it follows that the way which our *Author* has chosen is the best.

In the *Book* (to render it intelligible even to those who have read no *Conics*) the *Author* shews, how a *Parabola* arises from the Section of a *Cone*, then how to describe it *in plano*, and from that construction demonstrates that the *squares* of the *Ordinates* are one to another as the correspondent *Sagittæ* or intercepted *Diameters*; then he shews that if a line be inscrib'd in a *Parabola* perpendicular to any *Diameter*, a *Rectangle* made of the *Segments* of the *Inscript*, will be equal to a *rectangle* made of the intercepted *Diameter* and *Parameter* of the *Axis*. From this last propriety our *Author* deduces the universality of his *central* Rule for the Solution of all *Biquadratic* and *cubic Equations*, however affected or varyed

varyed in *terms* or *signs*. After the *Synthesis* our *Author* shews the *analysis* or *method* by which he found this Rule, viz. a *Parabola* being described, and a *point* in its *plain* given in *position*, he expresses 2 ways, the *radius* of a *Circle* passing through the *Vertex* of any *diameter*, i. e. by position of the given *Center*, and application of the foresaid *propriety* to express the *ratio* of the *radius* to the given lines of the *parabola*: So having an *Equation* of 4 *dimensions*, and rejecting equal on both sides, he depresses it to a *Cubic*, but adjoyning to it a quantity for the *Homogene* of the comparison, the *Equation* subsists in a *Biquadratic*, having all its *terms*, if the *Circle* be supposed to pass not thro the *vertex* of the *diameter*, but thro a *point* which being joyn'd with the *Vertex* and *Center* may terminate a right angled triangle.

This *Equation* he compares with another like it and equal to it; then by *equating* the *Coefficients* of these 2 *Equations* he presently discovers the *central* Rule; whose universal extent appears in *Biquadratic Equations* affected under all their *Parodic* degrees; for all the other *cases* where any *terms* are wanting, are but *Corollarys* or more compendious Constructions deriv'd from the general rule. So that the invention of the *rule* seems as much due to the last *Equation* of the *Coefficients*, as to the foresaid *propriety*, which is demonstrated by *Archimedes* in the *Section* of a *parabolic Conoid* by a *plane* parallel to the *axis*, and is particularly used by *Slusius* in his *Analytics*, who thereby constructs a *Biquadratic Equation* keeping all its *terms*. But then the *Analysis* of *Slusius* by breaking the *Equation* into 2 others to find 2 *places* is very different from that whereby our *Author* found his *central rule*; then which nothing can be expected more easie, simple, or universal; seeing any *Parabola* being once for all described, will give all the roots true and false, of any *Equation* without reduction or any alteration.

ERRATUM. p. 518. *line the last, read* Nubigenum.

OXFORD, Printed at the *THEATER*, and are to be sold by *Moses Pitt*, at the *Angel*, and *Samuel Smith*, at the *Princes Arms* in St. *Paul's Church-yard LONDON*. 1684.