Letter from Newton to John Collins, dated 8 November 1676

Author: Isaac Newton

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<58r>

Sir

I doubt you think I have forgot to answer your last letter, & to return you thanks for the pains you took in copying out for me the large letters of those two ingenious persons M. Leibnitz & M. Tschurnhause. As for what you propound about the former's calculation, you have well corrected $\frac{8r^5}{\boxed{3}\,\overline{rr+zz}}$ by turning it to $\frac{8r^5zz\beta}{\boxed{3}\,\overline{rr+zz}}$ where it signifies an area, but the ordinate NP is rightly $\frac{8r^5}{\boxed{3}\,\overline{rr+zz}}$, it being produced by dividing the rectangle ${}_1P_1N_1N_2P_3$ viz $\frac{8r^5zz\beta}{\boxed{3}\,\overline{rr+zz}}$ by its' base β.

You seem to desi{re} {that} I {would} publish my method & I look upon your advice as an act of singular friendship, being I beleive censured by divers for my scattered letters in the Transactions about such things as no body els would have let come out without a substantial discours. I could wish I could retract what has been done, but by that, I have learnt what's to my convenience, which is to let what I write ly by till I am out of the way. As for the apprehension that M. Leibnitz's method may be more general or more easy then mine, you will not find any such thing. His observation about reducing all roots to fractions is a very ingenious one, & certainly his way of <58v> extracting affected roots is beyond it: but in order to series they seem to me laborious enough in comparison of the ways I follow, though for {other} ends they may be of excellent {use}, As for the method of Transmutations in general, I presume he has made further improvements then others have done, but I dare say all that can be done by it may be done better without it, by the simple consideration of the ordinatim applicatæ: not excepting the method of reducing roots to fractions. The advantage of the way I follow you may guess by the conclusions drawn from it which I have set down in my answer to M. Leibnitz: though I have not said all there. For there is no curve line exprest by any æquation of three terms, though the unknown quantities affect one another in it, or the indices of their dignities be surd quantities (suppose { $ax^\lambda + bx^\mu y^\sigma + cy^\tau = 0$ }, where x signifies the base, y the ordinate , λ, μ, σ, τ, the indices of the dignities of x & y, & a, b, c known quantities with their signes + or −) I say there is no such curve line but I can in less then half a quarter of an hower tell whether it may be squared or what are the simplest figures it may be compared with, be those figures Conic sections or others. And then by a direct & short way (I dare say the shortest the nature of the thing admits of for a general one) I can compare them. And so if any two figures exprest by such æquations be propounded I can by the same rule compare them if they may be compared. This may seem a bold assertion because its' hard to <59r> say a figure mayor may not be squared or compa{red} with another, but it's plain to me by the fountain {I} draw it from, {though I} will not undertake {to} prove it to others. The same method extends to æquations of four terms & others also but not so generally. But I shall say no more at present but that I am

Yours to serve you

Is. Newton

Cambridge.
Novemb. 8. 1676.

For M^r John Collins
at the Farthing Office in
Fanchurch Street

London

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