

Quotes on the Infinite

Newton on the “limit”: *Ultimate ratio is a ratio of quantities not before they vanish, nor after, but that with which they vanish*

Leibniz on “infinitely small quantities”: *It will be sufficient if, when we speak of ... infinitely small quantities (i.e., the very least of those within our knowledge). It is understood that we mean quantities that are... indefinitely small... If anyone wishes to understand these [the infinitely small] as the ultimate things..., it can be done..., ay even though he think that such things are utterly impossible; it will be sufficient simply to make use of them as a tool that has advantages for the purpose of calculation, just as the algebraists retain imaginary roots with great profit.*

Bishop Berkeley on Newton’s fluxions: *All these points [of mathematics], I say are supposed and believed by certain rigorous exactors of evidence of religion, men who pretend to believe no further than they can see ... But he who can digest a second or third fluxion, a second or third differential, need not, methinks, be squeamish about any point in divinity.*

And what are these fluxions? The velocities of evanescent increments. And what are these same evanescent increments? They are neither finite quantities, nor quantities infinitely small, not yet nothing. May we not call them the ghosts of departed quantities?

Cauchy on limits: *When the values successively attributed to a particular variable approach indefinitely a fixed value, so as to end by differing from it by as little as one wishes, this latter is called the **limit** of all the others.*

Gauss on the infinite (1831): *... As to your proof I must protest most vehemently against your use of the infinite as something consummated, as this is never permitted in mathematics. The Infinite is but a figure of speech; an abridged form for the statement that limits exist which certain ratios may approach as closely as we desire, while other magnitudes may be permitted to grow beyond all bounds... No contradictions will arise as long as Finite Man does not mistake the infinite for something fixed, as long as he is not led by an acquired habit of mind to regard the infinite as something bounded.*