

Veronese's non-Archimedean continuity

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The paper focuses on the history of the “Archimedes axiom”, a name that was first given by Stolz in 1882 to a mathematical sentence occurring in Euclid’s Book V to express an intuitive content concerning quantity measurement in proportion theory. The name was later associated to the analysis of continuity in Hilbert’s Grundlagen, where it first expressed continuity tout court, and subsequently just a component of continuity, as in the second edition of the text, where Hilbert included it between the axioms of the fifth group together with a maximal axiom. It will be shown that beyond Euclid and Hilbert, a plethora of lesser-known authors essentially contributed to the axiomatic formulation of continuity (Stolz, but also Veronese and Baldus, for example). It will be claimed that alternative axiomatic formulations of the Archimedean axiom not only offered more rigorous formulations of some intuitive notion of continuity but allowed the latter to be specified and decomposed into simpler components. Different axiomatic presentations, which have followed one another historically and often emerged in a distant dialogue between various authors, have gradually clarified and sometimes broken down into distinct elements the intuitive content initially associated with the idea of measuring magnitudes, and then progressively refined with reference to certain minimal properties of continuity.

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