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Revisiting the reception history of Veronese's non-Archimedean geometry: Fondamenti di geometria between modernism and counter-modernism

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Saša Popović, Revisiting the reception history of Veronese's non-Archimedean geometry: Fondamenti di geometria between modernism and counter-modernism

Abstract. Following his important contributions to the projective geometry of hyperspaces from the 1870s and 80s, Giuseppe Veronese (1854–1917) introduced non-Archimedean geometry between 1889 and 1891, and elaborated it in a series of seminal publications over the next two decades, up to 1908/9. Initially, Veronese's results were widely discussed by leading mathematicians (e.g. T. Levi-Civita, G. Peano, G. Cantor, D. Hilbert, M. Dehn, L. E. J. Brouwer, C. S. Peirce, H. Poincaré, H. Hahn, etc.), as well as in major reference journals (e.g. the Jahrbuch), mathematical encyclopaedias and lexicons of the time. His work also quickly garnered the attention of philosophers working on the foundations of mathematics (e.g. the Marburg neo-Kantians). However, shortly after this initial burst of enthusiasm for Veronese's new geometry, already at the beginning of the 1920s we can see that discussions in both mathematical and philosophical circles started shifting to other mathematical subjects and, consequently, to other authors, resulting in a somewhat peculiar situation that Veronese's results seem to be almost entirely unknown by contemporary mathematicians, philosophers and historians of mathematics alike. This striking asymmetry in the initial and final stages of the reception of Veronese's theory will be at the heart of my talk. I will indicate what were the key factors which negatively impacted further dissemination and development of Veronese's ideas, as well as who were the "main culprits" for what may be considered a damnatio memoriae of Giuseppe Veronese in the actual practice of contemporary (non-Archimedean) mathematics, as well as in contemporary historiography. In 1990, Mehrtens proposed an analysis of the modernization process of fin-de-siècle mathematics in terms of a conflict between "the moderns" and the "counter-moderns". We shall see how Veronese's work fits into the broader modernist geometrical foundational programmes, especially Hilbert's, and, what is more, I will try to show that Veronese's Fondamenti di geometria (1891) not only represents a clear example of the "perfect pre-Hilbert style" of doing mathematics, but that there is a continuous developmental path from Veronese's geometrical investigations from the 1890's all the way up to late 20th century non-Archimedean theories such as, e.g., A. Robinson's Non-Standard Analysis from the 1960s and J. H. Conway's theory of surreal numbers from the 1970s.

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