The classification of mathematical disciplines and *Mathesis Universalis* in the 16th and 17th centuries: a study of Adriaan van Roomen's thought

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Many studies on the classification of disciplines, their specificities and differences were performed along the 16th and 17th centuries. Scholars like Petrus Ramus (1515-1572), Christoph Clavius (1538-1612), Adriaan van Roomen (1561-1615) and Francis Bacon (1561-1626) not only devoted themselves to sorting, organizing and establishing hierarchies within the disciplines they called 'mathematical', but also to the study of the nature of mathematical knowledge to understand whether the type of demonstration used in mathematics produced certain and indubitable knowledge, in addition to establishing relationships with other fields, philosophy in particular. In the present study, I analyzed works *Universae Mathesis Idea* (1602) and *Liber primus* of *Mathesis Polemica* (1605), which contain short descriptions of the 18 disciplines van Roomen called as 'mathematics'. Such disciplines were divided in two groups: principal mathematics, in turn subdivided in pure (logistics, *prima mathesis*, arithmetic, and geometry) and mixed (astronomy, uranography, chronology, cosmography, geography, chorography, topography, *topothesis*, astrology, geodesy, music, optics, and *euthymetria*); and mechanical mathematics (*sphaeropoeia*, *manganaria*, *mechanopoetica*, *organopoetica*, and *thaumatopoetica*) that were related with the use and construction of machines, a subject in turn directly related with mathematical instrumentation, which underwent significant development at that time. Van Roomen also included a brief chapter on subjects he called 'quasi mathematics'. Among other topics, van Roomen's description of the mathematical disciplines included the study subject and principles, their place relative to other disciplines and the usefulness of each one. In addition to attempting to contribute to the studies on van Roomen's life and work, I also sought to understand some aspects of the philosophical status of mathematics at that time. Then, I was also interested in relating van Roomen's classification of mathematics to two other relevant issues in the mathematics of his time, to wit, the attempts at creating a *mathesis universalis*, i.e., a universal knowledge able to demonstrate the knowledge produced by any mathematical discipline, and the debates on the *quaestio de certitudine mathematicarum*, that is, whether the knowledge demonstrated by the mathematical sciences could be considered correct according to the canons of Aristotelian philosophy. I also added some indications showing that the debates were also related with the social status of mathematics. Funding: grant #2011/20315-0, São Paulo Research Foundation (FAPESP).

Keywords

Adriaan van Roomen; History of mathematics; 16th and 17th centuries; Classification of mathematics; *Mathesis Universalis*; *Quaestio de certitudine mathematicarum*