JABEL RAMIREZ, University of La Laguna

The philosophical heritage of Leibniz' mathesis universalis in modern computational mathematics

In the Regulae, Descartes writes that there must be a "general science that explains everything that is possible to explain concerning order and measure, without assigning any particular measure." This science was called mathesis universalis. Leibniz later picked up this idea and developed it in various essays between 1666 and 1704. Leibniz would have distinguished between a characteristica universalis or lingua characteristica and a calculus ratiocinator. The first would consist of a rational language of thought, whose mission would be to directly represent our concepts and their relationships, that is, the conceptual structure of the world; while the second would constitute a symbolic calculation whose aim would be the algorithmization of reasoning, of human thought. This distinction signified the emergence of two currents with opposing views on the nature of the mathesis universalis, or universal symbolic language. On the one hand, the "algebraic" school of Boole, Peirce and Schröder, and, on the other hand, mainly Frege, who in his Begriffsschrift opts for a characteristica universalis. These two visions affect, as Jean van Heijenoort points out, logic, which can be considered a language or a calculation, but it also transcends in linguistics with the works of Jakko Hintikka. They also gave rise to Carnap's proposal for a universal language of logical and physicalist science. In this work we propose to investigate the possible relationships between these concepts and the epistemological characterization of computational mathematics; In this sense, we will analyze whether they have calculus or language properties in the Leibnizian sense.