

How Do Metalogical Concepts Emerge?

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We are going to share with the audience a few reflections about the origin (emergence) and development of some metalogical concepts, first of all those of *categoricity* and *completeness*.

The idea of an *unique* description of some fundamental structures from arithmetics and geometry can be found in the works of the American Postulate Theorists (e.g. Veblen, Huntington) as well as in the pioneering works of Dedekind, Peano and Hilbert. The concepts of categoricity and completeness were intertwined at the very beginning; this situation culminated in the *Gabelbarkeitssatz* proposed by Carnap in 1928.

The problem of completeness (of a system of logic) was in the meantime approached and solved (Bernays 1918, Post 1920, Hilbert and Ackermann 1928, Gödel 1930). Incompleteness of most important deductive theories has been established (Gödel 1931), thus showing the limitations of the Hilbert's Program. First-order logic became a standard. Tarski has codified the foundations of metalogic; in particular, connections of (several versions of) categoricity and completeness with other concepts (e.g. that of a *logical constant*) have been clarified. The importance of the *compactness* property became evident.

Some fifty years ago one could observe a revival of logical systems stronger than first-order logic. As a later consequence of this, discussions about which logic is *the* logic became of new interest (e.g. *the first-order thesis*). Again, the concepts of categoricity and completeness play a central role there.

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