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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*.[1]

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, 1921], [Hilbert and Ackermann 1928], [Gödel 1930]. Non-completeness 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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