# Computability, Gödel's Incompleteness Theorem, and an Inherent Limit on the Predicability of Evolution

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Abstract:
I will briefly review a main way in which mathematical modeling has been used to understand and predict evolutionary change. I will then highlight an important shortcoming of such approaches and consider an alternative that attempts to overcome the problem. This alternative encompasses what I refer to as "open-ended" evolution. I will then present a proof, using this approach, that certain evolutionary questions are inherently unanswerable unless the process of evolution has specific properties. The cause of this limitation on evolutionary theory is shown to be fundamentally the same as that underlying the Halting Problem from computability theory and Gödel's Incompleteness Theorem.