

Godel's comments about the "true reason" for incompleteness

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"The true source of the incompleteness attaching to all formal systems of mathematics, is to be found---as will be shown in Part II of this essay---in the fact that the formation of ever higher types can be continued into the transfinite (c.f., D. Hilbert, 'Über das Unendliche', Math. Ann. 95, p. 184), whereas in every formal system at most denumerably many types occur. It can be shown, that is, that the undecidable propositions here presented become always become decidable by the adjunction of suitable higher types. A similar result also holds for the axiom system of set theory."

This comment by Godel has me confused, first of all by what he means by "true source". Isn't his proof and later refinements/generalisations of it a "true source" for incompleteness? Also, I was under the impression that the whole point of Godel's theorem is that any kind of proof procedure or list of proof procedures that you can *even indicate* will not be able to decide all mathematical propositions. It sounds as if he is saying "ah, we can just continue adjoining higher types in such and such a manner, and eventually arbitrary statements become decidable (i.e. for any statement, it eventually becomes decidable)". I thought the whole point of Godel was that even if you spent a billion years outlining precisely a method of coming up with formal systems, there would still be propositions that could not be resolved by any of those formal systems.

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