Indeterminacy

(Winter 2002)

It is well known that, for example, the Continuum Hypothesis can't be proved or disproved from the standard axioms of set theory or their familiar extensions (unless those axiom systems are themselves inconsistent). Some think it follows that CH has no determinate truth value; others insist that this conclusion is false, not because there is some objective world of sets in which CH is either true or false, but on logical grounds. Claims of indeterminacy have also been made on the basis of such considerations as the existence of non-standard models of arithmetic, with similar rejoinders. We'll read some representative examples of the various positions and replies. (For background on second-order logic, see Stewart Shapiro, *Foundations without Foundationalism: a Case for Second-Order Logic*, (Oxford: Oxford University Press, 1991), chapters 3-5, and W.V. Quine, *Philosophy of Logic* (Englewood Cliffs, NJ: Prentice Hall, 1970), pp. 64-68.)

Second-Order Logic

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Andrezej Mostowski, 'Recent results in set theory', in I. Lakatos, ed., *Problems in the Philosophy of Mathematics*, (Amsterdam: North Holland Publishers, 1972), pp. 82-96.

Georg Kreisel, 'Informal rigour and completeness proofs', in Lakatos, op. cit., pp. 138-171.

Thomas Weston, 'Kreisel, the continuum hypothesis and second order set theory', *Journal of Philosophical Logic* 5 (1976), pp. 281-298.

Plural Logic

George Boolos, 'To be is to be a value of a variable (or to be some values of some variables', in his *Logic, Logic and Logic*, (Cambridge, MA: Harvard University Press, 1998), chapter 4.

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Byeong-uk Yi, 'The language and logic of plurals', to appear.

Schema Logic

Charles Parsons, ‘The uniqueness of the natural numbers’, *Iyyun* 39 (1990), pp. 13-44.

Stewart Shapiro, *Foundations without Foundationalism*, pp. 62-63, 68-69, 72-73, 87-88, 246-250.

Shaughn Lavine, *Understanding the Infinite*, (Cambridge, MA: Harvard University Press, 1994), pp. 228-240.

Vann McGee, ‘How we learn mathematical language’, *Philosophical Review* 106 (1997), pp. 35-68.

--------, ‘Everything’, in G. Sher and R. Tieszen, eds., *Between Logic and Intuition*, (Cambridge: Cambridge University Press, 200), pp. 54-78.

Hartry Field, ‘Postscript’, *Truth and the Absence of Fact*, (Oxford: Oxford University Press, 2001), pp. 351-360.

First-Order Logic

Hartry Field, ‘Are our logic and mathematical concepts highly indeterminate?’, *Midwest Studies in Philosophy* 19 (1994), pp. 391429.

--------, ‘Which undecidable mathematical truths have determinate truth values?’, in H.G. Dales and G. Oliveri, *Truth in Mathematics* (Oxford: Oxford University Press, 1998), pp. 291-310, reprinted in his *Truth and the Absence of Fact*, pp. 332-350.

Additional reading:

D. A. Martin, ‘Multiple universes of sets and indeterminate truth values’, *Topoi* 20 (2001), pp. 5-16.