Barry SMITH and David Woodruff SMITH (editors), *The Cambridge Companion to Husserl* (Cambridge, Cambridge University Press, 1995)

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by

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Newton C. A. DA COSTA, Jean-Yves BÉZIAU, and Otávio A. S. BUENO, *Aspects of paraconsistent logic*, Workshop on Logic, Language, Information and Computation '94 (Recife, 1994), Bulletin of the IGPL **3** (1995), 597–614. A historical discussion and expository survey of paraconsistent logic. The historical sections sketch some of the work of Jan Łukasiewicz of 1910) and N. A. Vasil'ev of 191) as the "forerunners" of paraconsistent logic, then turns to a consideration of Jaśkowski's work of 1948. Next the contributions in the field of da Costa and his colleagues from 1954 to Béziau's recent results are surveyed. After a technical exposition of work in the field and a philosophical discussion that argues that paraconsistent logic was developed as an alternative tool to, rather than as a rival of, classical logic, the bibliography lists almost forty works published since 1963.

Yvon GAUTHIER, *Hilbert and the internal logic of mathematics*, Synthèse **101** (1994), 1–14. The author asserts that Hilbert's program was partly inspired by Kronecker's program of founding an arithmetic theory of algebraic quantities. Finitism remains within the strictures of intuitive finite arithmetic remains, but metamathematics goes outside the safety of finitism in its effort to provide a foundation for an develop the structure of classical logic. This leads metamathematics into the danger of falling vicitim to Gödel's incompleteness results, and thus presents a serious challenge to metamathematics both from the perspective of Kronecker and Gödel. Hilbert's attempt to reconstitute classical logic is not influenced directly by Kronecker's finitism but by Kronecker's actual efforts to develop an arithmetic theory of algebraic quantities. It is Kronecker's mathematical work along these lines, rather than his philosophical perspective, that is seen as the forerunner to the Hilbert program. "Internal logic" is Gauthier's rendering of what Hilbert called "*das inhaltliche logische Schliessen.*"

Jeremy GRAY, *Many-valued logics*, The Mathematical Intelligencer **18**, no. 2 (1996), 23–25. Sketch of the work of Łukasiewicz and Post as the creators of many-valued logics and mentions Zadeh's work on fuzzy logic and MacColl, Charles Peirce, and N. A. Vasil'ev as the precursors of many-valued logics.

Douglas M. JESSEPH, *Berkeley's Philosophy of Mathematics*, Chicago/ London, University of Chicago Press, 1993. After writing (p. 131) that "contemporary model theory allows for the development of a consistent theory of infinitesimals," Jesseph goes on to assert that "[T]he relevance of current accounts of the infinitesimal to issues in the seventeenth and eighteenth centuries is rather minimal . . . ." This is *wrong* inasmuch as Abraham Robinson dealt explicitly with precisely this historical period in §1 of his article "The Metaphysics of the Calculus" of 1967, a paper which Jesseph does not cite. Jesseph incorrectly gives the date of publication of Robinson's *Nonstandard Analysis* as 1965 rather than 1966; H. Jerome Keisler's name is given by Jesseph as "Gerald Keisler"; and the publisher of Keisler's *Elementary Caculus: An Infinitesimal Approach* is given to be Academic Press rather than Prindle, Weber & Schmidt. Jesseph otherwise deals very little with nonstandard analysis as developed by Robinson, except to say in a footnote (n. 6, pp. 131–132) that '[I]n present-day accounts, infinitesimals appear as "hyperreal" numbers in certain nonstandard models of arithmetic, and contemporary accounts of hyperreal numbers define the product of two hyperreals as a hyperreal number,' since Robinson's work is chronologically outside of his topic.

Seymour KASS, *Karl Menger*, Notices of the American Mathematical Society **43** (1996), 558-561. Obituary of Karl Menger (1902 - 1985).

Ernst KLEINERT, *Über das Unendliche in der Mathematik*, Math. Semesterber. **40** (1993), nr. 1, 29–37. The author believes that mathematicians have largely adopted Hilbert's view that the infinite and the finite are to be treated on an epistemologically equal footing, as having the same ontological status, *viz.* existing as formal objects. Hilbert's formalism is seen to stem from his defense of the Cantor's transfinite.

Michael-Thomas LISKE, *Ist eine reine Inhaltslogik möglich? Zu Leibniz' Begriffstheorie,* Studia Leibnitiana **26** (1994), 31–55. An interpretation of Leibniz's logical calculi from the perspective of the question of whether a pure logic of content is possible.

Gabriele LOLLI, *Insiemi. Nascita di un'idea matematica*, Lettera Pristem **17** (1995), 12–19. The creation of set theory is traced to Dirichlet's conjecture on the representability in series of arbitrary functions. Cantor's philosophical distinction between potential and actual infinity is seen as a necessary prerequisite to the development of set theory. The evolution of Cantor's thought on set theory and the notion of *set* is sketched.

Roman MURAWSKI, *Hilbert's program: incompleteness theorems vs. partial realizations*, Jan Woleński (editor), *Philosophical Logic in Poland* (Dordrecht, Kluwer Academic Publishers, 1994), 103–127. A sketch of work on the prolems of implementing Hilbert's program, especially work carried out in Poland. It is argued that the meaning of Gödel's incompleteness theorem is unclear, so that it is therefore not clear whether Hilbert's original program indeed failed. It is also argued that the work of Harrington and Paris supports the conclusion that a partial realization of Hilbert's program must fail because they proved that all decidable sentences have metamathematical content. Finally, it is argued on the other hand that work in reverse mathematics offers the potential for realization of Hilbert's program for significant fragments of classical mathematics.

Drake O'BRIEN, *Symbolic Logic from an Aristotelian Ground*, 1994. Published electronically on the internet; WWW URL: http://mindlinknet/a13231/obrien04.zip. This 55-page manuscript is an effort by an amateur logician to interpret [higher-order] "predicate logic" in terms of Aristotelian syllogistic, as presented in neo-Thomistic guise by Jacques Maritain's 1937 *Introduction to Logic*, by developing a set-theoretic model of Aristotelian logic. (It should be noted that even defenders of scholastic logic such as Fr. Philotheus Boehner criticized Maritain's neo-scholastic logic for its refusal to recognize or utilize the formal rigor shared by medieval scholastic logic and modern mathematical logic.)

Chris SWOYER, *Leibniz's calculus of real addition*, Studia Leibnitiana **26** (1994), 1–30. Swoyer uses Leibniz's text to formulate a calculus of inclusion and a "conjunction-like operator" and applies it to proofs of theorems in semilattice theory. It is suggested, but not said, that these theorems were known to Leibniz.