PHIL G4451: History of Logic: From De Morgan to Frege — Spring 2014

Tuesday, 12:10-2:00pm, 716 Philosophy Hall

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Description

The roots of logic may be traced to Aristotle, who systematized and codified the subject in a way that was not significantly surpassed for over two millennia. Logic was revived in the mid-nineteenth century, at the beginning of a revolutionary period when the subject developed into a rigorous discipline whose exemplar was the exact method of proof used in mathematics. The development of so-called "symbolic" or "mathematical" logic during this period is the most significant in the two-thousand-year history of logic, and is arguably one of the most important and remarkable events in human intellectual history. The aim of this course is to provide a critical reconstruction of such a development along with an assessment of its philosophical significance. After some general background devoted to the history of the subject from Aristotle to Leibniz and beyond, the course will focus on the work of such logicians as Augustus De Morgan, George Boole, William Jevons, John Venn, and Ernst Schröder, which may be seen collectively as setting the stage for the definitive step in the revolution that resulted in logic as we know it today—Gottlob Frege's *Begriffsschrift*.

Requirements

Prerequisites: one term of symbolic logic or instructor permission. The final grade is determined as follows: class participation (10%), two take home tests (20% each), final paper (50%). Students taking the class for R-credit are not required to write the final paper.

Outline (tentative)

Jan 21	Introduction: Logic in the history of philosophy
Jan 28	Aristotelian logic
Feb 4	Beyond Aristotle: from the Stoics to Leibniz, Euler, Hamilton, and Mill
Feb 11	The nineteenth-century revolution: logic as algebra (introduction)
Feb 18	Augustus De Morgan (*Formal Logic*, 1847)
Feb 25	George Boole (*Mathematical Analysis of Logic*, 1847)
Mar 4	George Boole (*Investigation of the Laws of Thought*, 1854)
Mar 11	William Stanley Jevons (*Pure Logic*, 1864, and *Elementary Lessons in Logic*, 1870)
Mar 25	John Venn (*Symbolic Logic*, 1881)
Apr 1	Ernst Schröder (*Vorlesungen über die Algebra der Logik,* 1890–1905)
Apr 8	Charles Sanders Peirce
Apr 15	Alfred North Whitehead and his *Treatise on Universal Algebra* (1898)
Apr 22	Charles Lutwidge Dodgson, a.k.a. Lewis Carroll
Apr 29	Frege and the birth of contemporary logic

Readings

Excerpts from the main works by the authors covered in classs will be made available through CourseWorks.

There will be no textbook, although the following volumes provide useful background:

– Joseph M. Bocheński, *Formale Logik*, Alber 1956 (*History of Formal Logic*, Notre Dame 1961)
– William C. Kneale and Martha Kneale, *The Development of Logic*, Clarendon 1962.
– Günther Patzig, *Die aristotelische Syllogistik*, Vandenhoeck & Ruprecht 1963^2 (*Aristotle's Theory of the Syllogism*, Reidel 1968).
– Theodore Hailperin, *Boole's Logic and Probability*, North-Holland 1976 (Revised and enlarged: 1986)
– Souleymane Bachir Diagne, *Boole, l'oiseau de nuit en plein jour*, Belin 1989.
– Daniel D. Merrill, *Augustus De Morgan and the Logic of Relations*, Kluwer 1990.
– A. W. F. Edwards, *Cogwheels of the Mind: The Story of Venn Diagrams*, Johns Hopkins 2004.
– Dov M. Gabbay and John Woods (eds.), *Handbook of the History of Logic*, Elsevier 2004ff (esp. vol. 3, *The Rise of Modern Logic: From Leibniz to Frege*, and vol. 4, *British Logic in the Nineteenth Century*)