

Mathematical Summer Reading!

***Logicomix: An Epic Search for Truth*, by Apostolos Doxiadis and Christos Papadimitriou (Bloomsbury, 2009)**

“Well, this is unexpected—a comic book about the quest for logical certainty in mathematics. The story spans the decades from the late 19th century to World War II, a period when the nature of mathematical truth was being furiously debated. The stellar cast, headed up by Bertrand Russell and Ludwig Wittgenstein, includes the greatest philosophers, logicians and mathematicians of the era, along with sundry wives and mistresses, plus a couple of homicidal maniacs, an apocryphal barber and Adolf Hitler.”¹ Not to mention frequent references to the *Oresteia*.

***Gödel, Escher, Bach: an Eternal Golden Braid*, by Douglas Hofstadter (1979)**

“‘I began,’ [Hofstadter] writes, ‘intending to write an essay at the core of which would be Gödel’s Theorem. I imagined it would be a mere pamphlet.’” What emerged instead is a large, expensive, eclectic, beautifully designed and lucidly written book that attempts to link Gödel’s theorem to the art of M.C. Escher and to the music of J.S. Bach. The text is punctuated with over 150 illustrations, ranging from Escher’s prints to a drawing of an arch constructed by termites. Hofstadter discusses cellular reproduction and Zen koans. Each chapter is preceded by playful dialogues between Achilles and the Tortoise from Zeno’s paradox, and assorted other characters, including the author himself. The dialogues are modeled on Bach’s musical compositions and bear titles like ‘Three-Part Invention,’ ‘Chromatic Fantasy, and Feud,’ and ‘The Magnificrab, Indeed.’ The book, Hofstadter assures us, has ‘many levels of meaning’; it is meant to symbolize ‘at once Bach’s music, Escher’s drawings, and Gödel’s Theorem’...

“If Gödel’s theorem shattered a sort of dream, it seems as if Hofstadter is intent on creating another one, a dream filled with wordplay and association in which Gödel plays a metaphorical role. Such a dream could have dissipated into chaos; but instead the book is exhilarating, challenging, valuable, and frustrating. Hofstadter writes directly and playfully for the lay reader, explaining the most abstract and wide ranging arguments in short sections of great virtuosity. He is sophisticated in his understanding of the systems he explores and is adventurously speculative about their limits. But the book resists simple evaluation; it is at once surprisingly subtle and annoyingly naïve, exuberantly clever and embarrassingly silly.”²

***Everything and More: A Compact History of ∞* , by David Foster Wallace (W.W. Norton, 2003)**

“Most people would place infinity a long way behind gunpowder, printing and penicillin on their list of breakthroughs that changed the world. Indeed, it is debatable whether infinity even qualifies as a candidate in this competition, given that there are serious doubts about whether it really exists. Ever since antiquity, mathematicians and philosophers have harbored major suspicions about infinity, and while much of modern mathematics can’t do without it, these underlying qualms have never been entirely dispelled.

“If infinity is an unlikely topic, David Foster Wallace is an even more unlikely author. This high-octane new-generation novelist is scarcely a conventional science writer. True, he has a background in mathematics and philosophy, and much of his fiction is bursting with technical asides. ... Wallace offers a gripping guide to the modern taming of the infinite. If you want to know about this fascinating slice of intellectual history, do have a go at this book. But be warned that you will need more than your native wits to make it to the end.”³

***Incompleteness*, by Rebecca Goldstein (W.W. Norton, 2006)**

“[Goldstein] casts her brief biography of the logician Kurt Gödel (1906-78), as a touching intellectual love story. Though Gödel was married, his wife barely appears here; as Goldstein tells it, his romance was with mathematical Platonism, the idea that the glories of mathematics exist eternally beyond our grasp. Gödel’s Platonism inspired him to deeds as daring as any knight’s: he proved his famous incompleteness theorem for its sake. His Platonism also set him apart from his intellectual contemporaries. Only Einstein shared it, and could solace Gödel’s loneliness, Goldstein argues. A biography with two focuses—a man and an idea—*Incompleteness* unfolds its surprisingly accessible story with dignity, tenderness and awe.”⁴

¹Jim Holt, “Algorithm and Blues,” *The New York Times*, 27 September 2009.

²Edward Rothstein, “The Dream of Mind and Machine,” *The New York Review of Books*, 6 December 1979.

³David Papineau, “Room For One More,” *The New York Times*, 16 November 2003

⁴Polly Shulman, *The New York Times*, 1 May 2005