

# BOOK REVIEWS

## INFINITE TEST

Stephen Burn

**EVERYTHING AND MORE:  
A COMPACT HISTORY OF  $\infty$**

David Foster Wallace

Atlas Books/Norton  
http://www.wwnorton.com  
332 pages; cloth, \$23.95

In his first five books, David Foster Wallace displayed an intellectual restlessness and artistic versatility that made it difficult to predict the next point on the rising curve of his career. In the 1990s alone, he moved from the short stories and metafictional exercises of *Girl with Curious Hair* (1989) to explore the encyclopedic mode in *Infinite Jest* (1996) before shifting to reportage (in *A Supposedly Fun Thing I'll Never Do Again* [1997]) and finally experimenting with concision in *Brief Interviews with Hideous Men* (1999). Each new book abandoned the genre of the preceding work. But even readers accustomed to the constant shifts of Wallace's writing will find the dense mathematical explorations of his sixth book, *Everything and More: A Compact History of  $\infty$* , a surprising departure.

*Everything and More* outlines the significance of Georg Cantor's development of abstract set theory and transfinite mathematics in the late-nineteenth century. Cantor's work proved that some infinities are larger than others and resolved what Wallace reveals to be math's centuries-old struggle to deal with the idea of infinity. Given the scale of this struggle, a framework of vast historical scope is required to illuminate Cantor's achievement, so Wallace begins with Ancient Greek math and traces the trajectory of infinity to the twentieth century, at the brink of Kurt Gödel's incompleteness theorem. The approach, then, is broadly chronological, but Wallace regularly breaks the historical narrative to insert timelines, emergency glossaries elucidating technical vocabulary, and (of course) digressive footnotes that range from Anglican calc's reliance on Binomial Theorem to speculations about why almost all history's great philosophers never married.

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It is possible to locate intimations of this shift to abstract mathematics in Wallace's earlier fiction. Cantor's arithmetic of the infinite is, after all, alluded to in *Infinite Jest*, where James Incandenza's approach to tennis is informed by Cantor's Diagonal Proof. Equally, readers of Wallace's first novel, *The Broom of the System* (1987), will recognize Bertrand Russell's paradox of the "barber who shaves all and only those who do not shave themselves" (which appears late in *Everything and More* as a form of Russell's critique of naïve set theory) as the clue that Lenore Beadman finds at Shaker Heights Nursing Home. But the shape and intellectual demands of *Everything and More* seem to arise

directly from the problems with writing about mathematics that Wallace articulated in a review-essay for *Science* that appeared late in 2000.

In this review of two dreadful-sounding mathematical novels, Wallace observed that "modern math is like a pyramid, and the broad fundament is often not fun. It is at the higher and apical levels...that the fun and profundity start." With this in mind, Wallace has evidently taken pains in the early sections of the book (where he walks the reader through infinity's mathematical foundations) to compensate for the low-level intellectual rewards with an engaging, anecdotal style that maintains a strong human focus. In the following extract, for example, Wallace explains the distinction between the inductive truths of science and the deductive truths of mathematics with this account of the principle of induction that he claims is based on childhood memories of a stay on a relative's farm:

There were four chickens in a wire coop off the garage, the brightest of whom was called Mr. Chicken. Every morning, the farm's hired man's appearance in the coop area with a certain burlap sack caused Mr. Chicken to get excited and start doing warmup-pecks at the ground, because he knew it was feeding time. It was always around the same time  $t$  every morning, and Mr. Chicken had figured out that  $t(\text{man} + \text{sack}) = \text{food}$ , and thus was confidently doing his warmup-pecks on that last Sunday morning when the hired man suddenly reached out and grabbed Mr. Chicken and in one smooth motion wrung his neck and put him in the burlap sack and bore him off to the kitchen....Mr. Chicken appears now actually to have been correct—according to the Principle of Induction—in expecting nothing but breakfast from that  $(n + 1)$ th appearance of man + sack at  $t$ ....[T]his seems concretely creepy and upsetting.

These passages are entertaining but time-consuming, and as Wallace continually stresses that mathematical notation is so much more compact than natural language, it's appropriate that as the mathematical pace quickens, the anecdotal digressions drop away and are replaced by the concision of equations. This transition is presumably timed to take place at the point where the higher-level pleasures of mathematics replace the fun of Wallace's digressions, though his characteristic slangy prose and observational humor remain much in evidence (Cantor, for example, is memorably described as "a completely average-looking bourgeois German from the era of starched collars and fire-hazard beards").

Despite these asides, it is Wallace's willingness to dispense with his trademark digressive prose and present the reader with abstract mathematics that represents both the unique achievement and readerly challenge of *Everything and More*. Wallace's book makes a serious attempt to elucidate complex mathematics for a general audience without making the compromises that he criticizes in earlier "pop books that give such shallow and reductive accounts of Cantor's proofs...that the math is distorted and its beauty obscured..." But, in so doing, he approaches another of the problems he diagnosed in his 2000 *Science* review. In a magnificent dismissal of the

books under review, Wallace wrote: "the type of audience most likely to accept and appreciate these novels' lofty, encomiastic view of pure math is also the audience most apt to be disappointed by the vague, reductive, or inconsistent ways the novels handle the actual mathematics they're concerned with.... [N]ecessary conditions for liking the novel[s] are also sufficient conditions for disliking [them]." The central problem with *Everything and More* is not that Wallace's math is vague, reductive, or inconsistent, but rather that the kind of audience able to follow the equations is probably the kind of audience who were already close to appreciating the beauty of transfinite math anyway. Wallace tries to address this problem by labeling sections of the book as either skippable or as "if you're interested" optional extras. This helps cater for varying degrees of mathematical sophistication, but even the extra-help sections of the book, as Wallace concedes, "are going to be brutal" for some readers. The suspicion remains, however, that this problem is just an aspect of a larger problem that lies at the core of the genre of popular science: how can the mathematical subtleties of science be conveyed to a nonspecialist audience? Decades earlier, for example, Richard Feynman complained in *The Character of Physical Law* (1965) that it was "impossible to explain honestly the beauties of the laws of nature in a way that people can feel, without their having some deep understanding of mathematics." And any attempt to explain science without math, Feynman said, was like teaching music to the deaf. This difficulty is obviously magnified when the science being elucidated is mathematics itself, and it is to Wallace's credit that he does not attempt to neuter his subject. *Everything and More* represents a brave detour for Wallace, and though the mathematical subtleties of the last hundred pages may inevitably be beyond some readers, there is a lot to learn, and a lot to enjoy, in the book.

Stephen Burn is the author of David Foster Wallace's *Infinite Jest: A Reader's Guide* (Continuum, 2003). He currently teaches English at Northern Michigan University.



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