

BOOK REVIEW

Benjamin Labatut, *The MANIAC*

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Darren Aronofsky's 1998 surrealist film *Pi* tells the story of Max, a tortured mathematician driven to madness by his belief that mathematics can offer certain order to the world. The low-budget film that became an unlikely box office success depicts the holy trinity of popular narratives of mathematicians: reclusive genius, madness and religion. Benjamin Labatut's fictionalized biography of John von Neumann is a newcomer to this well-trodden road. Two suicides open the novel. Austrian theoretical physicist Paul Ehrenfest shoots his son and himself in the book's opening line. His compatriot, physicist–philosopher Ludwig Boltzmann, survives just five more pages before taking his own life. These acts of self-destruction foreshadow much of what follows. Labatut is pre-occupied with minds coming apart at their seams. These suicides are not responses to a hostile world increasingly characterized by hate, violence and destruction, but instead are driven by the internal turmoil of mathematical minds at work. Madness and religious belief, the author posits, are the only responses of those confronted with the limits of human rationality. Or a more accurate phrasing of the trinity, which Labatut proposes, is that those geniuses who choose to dedicate themselves to science rather than religion inevitably fall into madness when confronted by the limits of reason. A loss of sense emerges from a failure to make sense.

Von Neumann's life is narrated through the eyes of those who knew him best. Each chapter is written from the perspective of those who accompany him in his life. Eugene Wigner, George Pólya, Richard Feynman and Oskar Morgenstern are just a few of those who share their memories of von Neumann. The book moves through his childhood and schooldays, early forays into the foundations of mathematics, appointment to the Institute for Advanced Study, work in Los Alamos and interest in early computing. Labatut has a gift for explaining difficult theories in relatable and intuitive ways. The reader is introduced to the foundational crisis in mathematics, Georg Cantor's theory, game theory and the theory of automata, not to mention contemporary machine learning – the focus of the last part of the book – presented as the culmination or latest incarnation of the problem that occupied von Neumann before his death. Although the narrative is fictionalized, it is clearly based on careful research and deep engagement with the underlying ideas that occupied von Neumann. It is a testimony to Labatut's talent as a writer that he does not simplify theoretical discussions of mathematics while managing to integrate them seamlessly into an engaging narrative. Even historians familiar with von Neumann's life and work will enjoy the book, but to do so they will first have to forget much of what they have learned.

For scholars who have worked to dispel the image of the lone male genius and draw attention to the collaborative nature of scientific practice, Labatut's celebration of von Neuman's unique intellect might feel jarring, if not outdated. The characters who populate the book are sidekicks tasked with highlighting von Neumann's brilliance, not equal partners in a shared intellectual project. Reading the book the week *Oppenheimer* won Best Picture at the Oscars, I was struck that most people still consume stories about science through hagiographies of Great Men. This is despite the fact that the best history of science has never denied the glowing intellects driving great scientific achievements, but has simply tried, by placing scientists in their times, to show the conditions under which such intellects flourish. Labatut's von Neumann, however, exists beyond time and place. As described in the book's early pages, he was 'an alien among us' (p. 35).

Labatut's fixation with genius and the limits of reason was evident in his earlier, much celebrated *When We Cease to Understand the World* (2020), a similarly fictionalized account of famous scientists' lives. Here, too, Labatut's attention lands on the perils that accompany the scientific search for meaning. In the present novel, von Neumann's first crisis of faith (or rather reason) is triggered by Kurt Gödel's incompleteness theorem, which put an end to David Hilbert's program of rooting mathematical knowledge in certain grounds. If mathematics is not based on an unshakable foundation, how can other sciences make claims to truth? Von Neumann's crisis culminated on his deathbed, where he searched for meaning beyond rationality, causing Wigner to wonder, 'where was the rational and extremely grounded man I had always known?' (p. 222). The tension Labatut seeks to dramatize is built on the assumption of a sharp line between rationality – understood as science and logic – and belief in a higher power. Historians of science have already challenged this dichotomy: not only was the distinction extremely blurry prior to the twentieth century, but the disenchantment of the world is an incomplete project.

This leaves us with insanity. What explains fascination with the trope of the mentally ill mathematician? The twentieth century furnishes several examples, from Cantor and Gödel to John Nash, Alexander Grothendieck and Grigori Perelman. They have been the subjects of books, BBC specials, Hollywood films and two *New Yorker* profiles – Labatut's interests are not unique. A simple answer would be that these individuals are marginal; considering the number of practising mathematicians, the percentage with mental illness is no higher than that of doctors, high-school teachers or plumbers. The former capture our imagination because the narrative fits romantic visions of mathematicians as socially awkward, neurotic or tormented. More than other experts, mathematicians remain objects of popular fascination in all their caffeine-fuelled, mismatched-socked, perambulatory glory. Not only are mathematical theories enchantingly abstruse; so, apparently, are those who generate them.

This image is not only projected onto mathematicians; they have cultivated it themselves for centuries. The romantic vision of the mathematician is one that the discipline not only tolerates, but perpetuates. Just think about a socially inept, single-mindedly obsessive, awkward young historian of science. The question is not whether he or she will be able to write a groundbreaking dissertation, but whether said historian will be able to get a job, rise through the ranks and garner recognition. In mathematics the answer is not only a resounding yes, but also that it might be a plus. But for the rest of us, madness is not virtue.