Like the Web Is Part of the Spider

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Applying too much presentism—interpreting past events in terms of modern values and concepts—can ruin fiction. The power of literature, after all, is in revealing and exploring the universal qualities that make us human, regardless of time or place.

Yet it's hard not to view Benjamin Labatut's *The Maniac* through the lens of today's rapid expansion of artificial intelligence. And at first blush, the book's primary subject—the Hungarian polymath and all-around genius John von Neumann (1903–1957)—doesn't have many qualities in common with the rest of us. A child prodigy, he became a young star in the mathematics community and, after immigrating to the United States, a major figure in the Manhattan Project and a pioneer across many fields of science, particularly computing.

I label von Neumann the "primary subject" instead of the "protagonist" because *The Maniac* isn't a novel, strictly speaking. Rather, Labatut calls it "a work of fiction based on fact." The fiction comes in the way most of the book is structured: narrative fragments written in first-person point of view by von Neumann's colleagues, collaborators, and loved ones. (Richard Feynman, for one, is a lot more fun than I would have anticipated.) The facts, then, are von Neumann's life, times, and achievements.

Seeing von Neumann through the eyes of others helps paint a holistic picture of him as mathematician, thinker, and man. Strikingly, many descriptions emphasize his extreme rationality combined with, as fellow mathematician Theodore von Kármán puts it, "almost childlike moral blindness." Von Neumann's tutor, Gabor Szego, describes him as possessing "a sinister, machinelike intelligence that lacked the restraints that bind the rest of us." If those depictions sound like an AI to you, you're in good company. It's telling that the one first-person perspective Labatut never gives the reader is von Neumann's own, almost as if his brain were as impenetrable as a computer.

But something else emerges from these perspectives, something quite human after all. What drove von Neumann, the reader learns, was a deep desire for order and rationality. In this, he's not alone. Labatut visited this theme in his first book, the aptly titled *When We Cease to Understand the World*, another quasi-fictional exploration of scientists and mathematicians grappling with chaos in their own minds and in the universe.

The world von Neumann inhabited was one of disorder and disconcerting change, a place where the creeping forces of fascism and nationalism grew ever stronger. And, under the weight of new scientific discoveries, the universe seemed to echo humanity's irrationality, terrifying mathematicians and even lay people. A passage attributed to von Kármán, for example—"inexplicable shapes of non-Euclidean space, populated with bizarre objects that suggested the impossible"—could have come straight out of the cosmic horror fiction of the contemporaneous H. P. Lovecraft.

In von Neumann's doctoral thesis, he set out to combat these forces, "to find the purest and most basic truths of mathematics, and to express them as unquestionable axioms, statements that could not be denied, disproven, or contradicted, certainties that would never fade or become distorted and so would remain—like a deity—timeless, unchangeable, and eternal." But his faith in eternal logic was shattered when he encountered Kurt Gödel's incompleteness theorems.

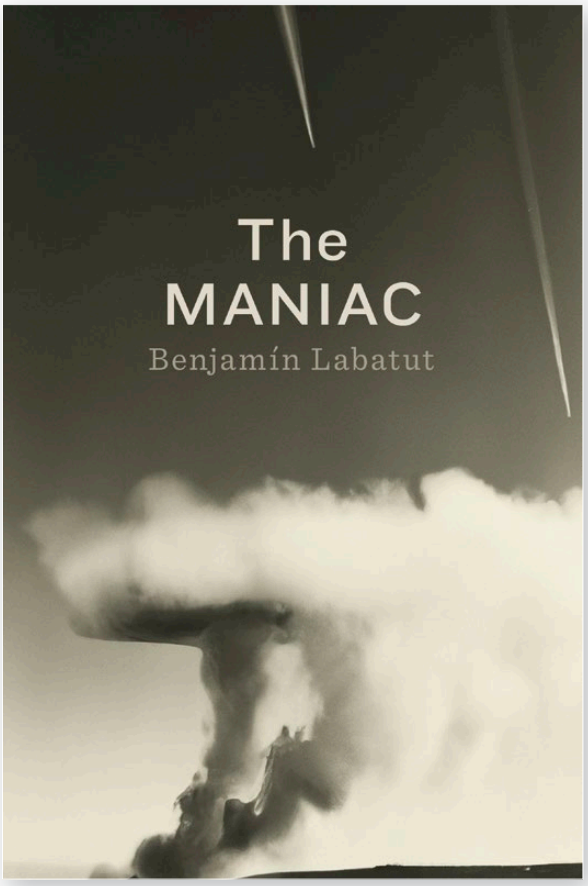
Von Neumann was part of a cohort of mathematicians and scientists who emigrated from Europe to the United

States before World War II—many as refugees—and became involved in the Manhattan Project. Building nuclear weapons required calculations, and lots of them. Von Neumann worked on the mathematics of the Fat Man plutonium bomb and became familiar with the machines used for speeding such calculations. After the war, interest in enhanced computing power continued, particularly for defense applications. The hydrogen bomb was much more powerful and complex than Fat Man, and von Neumann offered to build the US government a new, digital computer that could handle the needed calculations. In return, he requested the unused computing time for his own purposes. His plan was to explore the power of computing across many fields.

He called his machine MANIAC, for Mathematical Analyzer, Numerical Integrator and Computer. (Spoiler: it's not the only maniac in the book!) As Feynman puts it in one of the novel's passages: "It's scary how science works. Just think about this for a second: the most creative and most destructive human inventions arose at exactly the same time. So much of the high-tech world we live in today, with its conquest of space and extraordinary advances in biology and medicine, were spurred on by one man's monomania and the need to develop electronic computers to calculate whether an H-bomb could be built or not."

The last quarter of *The Maniac* jumps ahead 60 years after von Neumann's death, to the 2016 match between AlphaGo, a computer program, and human Go champion Lee Sedol. As relayed in exciting play-by-play action, the computer wins all games but one. Some of its moves are inspired and original, totally defying convention: rather than using brute force, the machine seems to be thinking. Yet at one point it also appears to become delusional, making nonsense moves. It's tempting to conclude that such "hallucination" accompanies any intelligence, human or machine.

The Maniac
by Benjamin Labatut. New York, NY: Penguin Press, 2023, 368 pp.



But Labatut warns that computer intelligence continues to grow. The newer AlphaZero, developed only a year later by Google's DeepMind, defeated AlphaGo 100 games to 0.

What motivated von Neumann was certainly nothing like what drives today's tech titans. He never spent a single moment trying to monetize your personal data or optimize your feed's algorithm to sell you handbags or sway your vote. But it remains an open question for me whether he abandoned his quest for order and rationality after accepting Gödel's theorems, or if he ultimately came to view machine intelligence as a means to overcome the limits of the human psyche and find the ultimate order he still believed existed in the universe.

In the present, it's safe to say that AI has so far amplified chaos rather than quelled it. Which gets to von Neumann's views about technology, laid out in a marvelous 1955 essay entitled "Can We Survive Technology?" There's no avoiding presentism here. The essay touches on AI and automation, nuclear power, climate change, and the extreme difficulty of disentangling the useful and dangerous implications of the same technologies (a theme addressed in *Issues*). Seventy years later, von Neumann's insights resonate with many current policy challenges.

No techno-optimist, he nonetheless viewed technological advances as inevitable. "For progress there is no cure," he wrote in the essay. "Technology—like science—is neutral all through, providing only means of control applicable to any purpose, indifferent to all." He urged his readers to consider technology not as separate from humanity, but "part of us, just like the web is part of the spider." But

if technology is part of us, then who are we? Will we use AI to help people, or to subdue, manipulate, and control them?

The path forward, he concluded, requires circling back to what humans have that the machines do not, the universals that make reading thought-provoking, frightening, and challenging books like *The Maniac* worthwhile. "To ask in advance for a complete recipe would be unreasonable," von Neumann wrote. "We can specify only the human qualities required: patience, flexibility, intelligence."

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