

This Is Your Brain on Borges

FOR the neuroscientist Rodrigo Quiroga, it was less of a Eureka! moment, and more of a click. That was the sensation, he says, when he realized that his research on neurons and abstraction bore an uncanny similarity to a story by Jorge Luis Borges he had read as a youth in Argentina. “There I was, the scientist, obsessed with trying to understand discoveries whose interpretation was already there,” in a story that “lay lost in my memory.”

“In our mad dash to understand ever more about the behavior of the brain, we tend to forget that this search is not exclusively ours,” Quiroga muses in **Borges and Memory: Encounters With the Human Brain** (MIT Press). Philosophers have mined the terrain, of course, but also brilliant intellectuals like Borges, who “defy any categorization” and reach astounding conclusions guided only by their reasoning and imagination.

In brief, Borges’s story “Funes the Memorious” (1942) concerns a peasant who falls from a horse, hits his head, and when he regains consciousness is afflicted with a totally comprehensive, nonselective memory. Funes remembers everything. “My memory, sir, is like a rubbish heap,” he tells the story’s narrator. For example, if the rest of us look at a vine and see the whole, Funes perceives and remembers every leaf, every twist of the stalk.

It is not only detail that plagues Funes. His memory preserves every iteration of the same thing. “Funes remembered not only every leaf on every tree on every mountain, but also each time he had perceived or imagined it,” writes Borges. Looking at one dog, Funes sees a canine plurality. He sees a different dog for each dog moment and dog position. “It bothered him that the dog seen in profile at 3:14 would be called the same as the dog at 3:15 seen from the front.” Funes is unable to flee into the abstraction that creates usable memory, Quiroga suggests.

Refreshing his own recall on the story, the neuroscientist became curious about Borges’s knowledge of psychology and the brain. In Buenos Aires, he contacted the author’s widow, María Kodama, and after several long discussions, she invited him to visit Borges’s private library. Quiroga made repeated visits, experiencing what he says felt like an “intimate conversation” with the icon of Argentine literature.

On the phone from England’s University of Leicester, where he is a professor and directs the Bioengineering Research Group, he elaborates. “It was like a treasure,” he says, describing his sojourn in Borges’s stacks, where he found books by William James, Gustav Spiller, and other figures in philosophy and psychology.

Quiroga was excited by Borges’s annotations. Not marginalia exactly. Borges liked to write notes on the title page or last page of a book, in a minuscule hand, before he went blind. Later he would ask those reading to him to write the annotations.

The result of Quiroga’s pilgrimages to the library was a *Nature* article that was expanded into a book, published in Argentina in 2011 and now in an English translation by Juan Pablo Fernández.

Reviews are trickling in for *Borges and Memory*. One critic in *Library Journal* cautioned: “Borges fans beware. The title teases more discussion of Borges than what the book actually delivers.” Similarly, a reviewer in *Publishers Weekly* wrote that Quiroga’s “analysis of Borges helps us to understand how neuroscience works, but his analysis of neuroscience does little to help us understand how Borges works.”

However Quiroga, to his credit, notes at the start that the book is not about Borges, but rather that Borges is a catalyst for his investigation. In the role of touchstone, Borges is present throughout.

At the heart of the book are multiple case histories, like that of Solomon Shereshevskii, who was studied by the Russian psychologist Alexander Luria, beginning in the 1920s. Shereshevskii’s astonishing recall was based, Quiroga says, on a strong case of synesthesia, a condition in which perceptions from one sense evoke others—seeing music or numbers as colors, for example. Other cases include “Patient H.M.,” who, like the lead character in the film *Memento*, is unable to create and store new memories, and Kim Peek, the savant who was the model for Dustin Hoffman’s character in *Rain Man*.

Quiroga also deals with how the story of Funes relates to his own research on the “Jennifer Aniston neuron.” Yes, really. Quiroga, with colleagues at UCLA and Caltech, has conducted research on neuronal activity in the human hippocampus—specifically the firing of neurons



IMAGE BY © HORACIO VILLALOBOS, CORBIS

Jorge Luis Borges in Buenos Aires in 1973

in response to visual stimuli familiar or relevant to the patients. The research involved electrodes inserted in the brains of epileptic patients whose “epileptic focus” was being mapped for future surgery. The electrodes then recorded the firing of neurons. Not surprisingly, most news-media attention was to the first and most famous of those neurons, which were activated by a variety of images of the actress, but by nothing else.

Quiroga explains how those neurons become the building blocks for memory: “If we did not have this type of neurons, we would end up like Funes the memorious, without the capacity to abstract or even to think, remembering only irrelevant details.”

The author also explores the “delicate balance between remembering and forgetting.” Is it benefit or bane that most of us cannot remember a childhood scene with the clarity of a DVD rewind? Recalling a day as a child gamboling on the beach, Quiroga writes that he prefers his memory incomplete, fragmentary, elusive. “I’d rather have it as it is, a faint memory, a little sad, with the nostalgia of a tango.”

Quiroga has other cautions. We live in a “Funes kind of world,” he writes, suggesting that the media’s bombardment of our senses gives a feeling of the inundation that Borges’s protagonist endures.

Beyond his interest in literature, Quiroga has collaborated with the Argentine artist Mariano Molina on a project that showed “principles of visual perception embedded in artworks.” Quiroga notes a trend toward collaboration between science and art, but he’d like to see more: “In many areas of art, there is a lot of expertise that scientists somehow do not pay much attention to.” He understands why. “For a scientist working with art, it’s like a nightmare, it’s really tough. Because in science you always look for objective truth. I want a formula that applies for every condition, like Newton’s law.”

While the hybrid *Borges and Memory* was Quiroga’s first book, he has just published, with Walter J. Freeman, *Imaging Brain Function With EEG: Advanced Temporal and Spatial Analysis of Electroencephalographic Signals* (Springer), which continues the themes of his lab work.

Asked whether he might consider a second book for a wide audience, Quiroga says he’s thought about something more general on science and art. Another possibility is fiction. A short novel, perhaps, or a short story. “Maybe the book on Borges will be a trampoline to start being more courageous and leaving science behind.”

—NINA C. AYOUB

NOTA BENE

