

Borges and I

The other one, the one called Borges, is the one things happen to. I walk through the streets of Buenos Aires and stop for a moment, perhaps mechanically now, to look at the arch of an entrance hall and the grillwork on the gate; I know of Borges from the mail and see his name on a list of professors or in a biographical dictionary. I like hourglasses, maps, eighteenth-century typography, the taste of coffee and the prose of Stevenson; he shares these preferences, but in a vain way that turns them into the attributes of an actor. It would be an exaggeration to say that ours is a hostile relationship; I live, let myself go on living, so that Borges may contrive his literature, and this literature justifies me. It is no effort for me to confess that he has achieved some valid pages, but those pages cannot save me, perhaps because what is good belongs to no one, not even to him, but rather to the language and to tradition. Besides, I am destined to perish, definitively, and only some instant of myself can survive in him. Little by little, I am giving over everything to him, though I am quite aware of his perverse custom of falsifying and magnifying things.

Spinoza knew that all things long to persist in their being; the stone eternally wants to be a stone and the tiger a tiger. I shall remain in Borges, not in myself (if it is true that I am someone), but I recognize myself less in his books than in many others or in the laborious strumming of a guitar. Years ago I tried to free myself from him and went from the mythologies of the suburbs to the games with time and infinity, but those games belong to Borges now and I shall have to imagine other things. Thus my life is a flight and I lose everything and everything belongs to oblivion, or to him.

I do not know which of us has written this page.

Jorge Luis Borges, *Labyrinths: Selected Stories and Other Writings*, New York: New Directions, 1964, pp. 246-47.

Ignorance and Mystery
Gale Rhodes

As a **structural biologist**, I look for connections between chemistry and life, with special interest in distinguishing ignorance from mystery. As an example of this distinction, imagine an object in your field of view, say, a dark loon, silhouetted

beyond breakers on the bright winter ocean. I can tell you a detailed scientific story about the light that comes to my eye from this scene, a tale that begins with photons diffracting off the loon and being focused on my retina by a proteinaceous lens. At the retina, the photon energizes a small organic molecule (which came into my body, by the way, in the form of vitamin A, perhaps from a bite of carrot). This molecule starts a cascade of events, many of them little more than changes in molecular shapes, that results in an electrical impulse that travels to my brain. Along the way, branching impulses are formed, and other impulses converge and mingle, and so this signal reaches the brain in a complex form, many nerve cells speaking at once, in varied rhythms. But in their mixed voices, my mind finds a sort of harmony: I say to myself that I see a loon, and I have to catch my breath.

Scientific analysis has revealed many of the molecular mechanisms that underlie perception. With each passing year, I could include additional specific technical details in my scientific story of seeing a loon. Some would say that science is removing the mystery from it. But I disagree. Science is a means of distinguishing ignorance from mystery, of separating them, as in a distillation. Some aspects of perception are still shrouded in ignorance, and will one day be revealed. But no amount of science will remove the essential mystery from the commonplace act of perceiving. For instance, at one end of the process is the photon, a little bit of pure mystery. We know the laws of photon behavior in great detail, but there is no adequate theory of the photon, no explanation of its action. There are the laws that we call quantum mechanics, which predict its behavior with stunning accuracy, but there is no quantum theory to explain why it acts that way. At the other end of the story there is me, the one who sees the loon and feels the excitement of kinship with an animal whose identical ancestors foraged off such shores long before my own ancestors, hardly recognizable as such, came down from trees. Where, in all this molecular machinery, is the *me*, the breathless observer? In the photon and in the self who, by collecting photons, sees the loon, lie mystery before which science stands powerless. I believe that this view of science makes science more accessible and less fearsome to students. In this light, we see that science cannot overpower the inherently mysterious, but can distill away ignorance to reveal, not dispel, mystery.

In the essay “Borges and I,” the Argentine writer Jorge Luis Borges (pronounced *bore-hayss*) plays with this mysterious self. He explores two selves, public and private. The private Borges (“I”) sounds like a typical scholar. He likes maps and certain authors, and you can readily imagine him in a library, quietly poring over beloved readings, or walking beside a stream, thinking about connections among the works he has read. On the other hand, the public Borges is the teacher, public

speaker, the author who might sign his books at a bookstore, or appear on late-night television to talk about his latest. The private Borges recognizes himself more in the books he loves than in the books the public Borges writes. He disapproves of the public Borges's "perverse custom of falsifying and magnifying" things that he quietly discovered out of real interest and love of scholarship. Of course, all along, we are reading the public Borges's well-known essay about the private Borges, an account that may falsify and magnify the concerns of the private one, so what are we to believe? Which is the real Borges?

Any teacher readily recognizes these two selves: the quiet, studious one who scores the exams, outlines the lecture, collects or designs the slides, and rehearses; and the animated performer in the lecture hall, moving the cursor across the illustration, spinning and zooming the protein models on the computer screen, asking or answering questions, handing back exams, and striding confidently back to the office. A self has many facets: public and private; in vacant, pensive, and expansive moods; energetic and exhausted; shaken by events and confident about the task at hand. At times you look back at your own rash, maudlin, or otherwise uncharacteristic action and ask, "Was that me?" Sometimes when I read a passage in my crystallography book, I ask, "Who wrote this? I don't remember having this command of the subject." (Of course, I find that it is very well done.)

The idea of self implies being able to distinguish self from other. A recent issue of *Science** contains a report claiming to bear on this question. The results support the notion that perceived ownership of a body part, such as your hand, relies in part on the action of neurons in the pre-motor cortex of the brain, two regions lying just below the surface of the brain just forward of the ears, above lines running straight back from the eyes. These regions become active when there are correlations between the sensory inputs of vision and touch. For example, if you see your arm being touched, and at the same time, you feel the touch, you know that the touched arm is yours. Seeing the touch but not feeling it could convince you that the arm is not your own. Feeling a touch, but seeing an arm with nothing touching it, can also convince you that the arm you see is not yours.

If this cluster of cortical cells is uniquely activated when correlation of sensory stimuli reveals self-ownership, then it is tempting to say that the pattern of nerve action in the pre-motor cortex is equivalent to, or is the neural manifestation of, the feeling that you own the arm. The next logical experiment is to artificially stimulate these cells to see whether one feels self-ownership in the absence of sensory inputs. But in fact, the increased activity of this cluster of cells tells us little about the feeling of ownership. With feelings, as with the self (another feeling?), we are

in a mysterious realm. Even if we can recognize in full detail the pattern of brain activity that corresponds to recognition of a body part; even if we can evoke convincingly that feeling of recognition by artificially producing the full pattern of brain activity, the self that is recognizing a part of itself is still a mysterious entity.

Why? Why is this kind of explanation inherently unsatisfying? Part of the answer must be the vast conceptual gap between the feeling itself and the molecular and cellular foundation of that feeling. Self-recognition does not *feel like* a bunch of cells receiving correlated inputs of light or mechanical stimulation; it does not *feel like* neurotransmitters flooding synapses, causing ion channels to open; it does not *feel like* electrical impulses propagating along axons. The feeling and the explanation seem to be not only two *different* things, but two entirely *different kinds* of things. And some sort of insoluble mystery seems to surround the kind of thing that feeling is. As I asked earlier, where, in all this molecular and cellular machinery, is the owner, the *me* who withdraws my arm suddenly after reaching over the candle for the biscuits. The stinging arm is certainly mine, but the ownership of the burned arm does not evoke images of conversations between pre- and post-synaptic nerve cells -- anything but. And that's why your friends who are majoring in literature will never be satisfied with structural biology's explanations of feelings, or of responses to art.

If feelings and the correlated nerve actions are two entirely different kinds of things, and the latter are the kinds of things that scientists delight in exploring, then what kinds of things are feelings? About all I can say is that feelings are the kinds of things that writers write about, musicians compose about, artists paint about; and they are the kinds of things evoked in us by convincing writing, moving music, and stunning art. The scientists run around stamping out ignorance about feelings where they can, leaving the true mystery of them undisturbed. On the other hand, artists and their ilk rub our noses in the mystery of our feelings, being much more interested in the experience of feelings than in explanations. Scientists want to understand feelings at the molecular level; writers and kin want to experience them and evoke them in others. You would think that never the twain could meet, but fortunately they can, and do. They meet in scientists who go home at night and read Emily Dickenson or Borges, or go to the opera. They meet in poets who set aside an unfinished piece and sit down to read *Scientific American*. Are there any such folks around today? Well, *you* are apparently interested in the creative works that I am providing as sidebars to this course, and the people who produced those works obviously know more than just a little science. Maybe C.P. Snow[†] was wrong when he argued that science and the humanities are two isolated cultures

that fail to understand each other. Among the really enlightened—who know that there is only one Borges—maybe there is really only one culture.

* August 6, 2004, p. 875.

† C.P. Snow, *The Two Cultures and the Scientific Revolution* (1959)