

Evolutionary Psychology

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Book Review

Neuroscience and I

A Review of Michael S. Gazzaniga, *Human: The Science Behind What Makes Us Unique*. HarperCollins, New York, 2008, 447 pp., US\$27.50, ISBN 978-0-06-089288-3.

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If there is one question that has puzzled humans longer than anything else, it must surely be: who am I? And just what makes me human? In short: why are humans seemingly so different from all other species of animals? Michael Gazzaniga's new book takes us through a virtuoso cavalcade of research over the last decade in search of the answer. It is a tour de force, because it covers such a wide range of disciplines from ethology and animal behavior to cognitive psychology and neuroscience, at each stage patiently steering the reader through layers of technical complexity to the core gems that lie within.

Mind, if you just want the answer, you could save yourself a long read—Gazzaniga gives it to us in the book's opening sentences (as it happened, I naturally read it last because it came in a short chapter entitled "Prologue" ...):

I always smile when I hear Garrison Keillor say, "Be well, do good work, and keep in touch." It is such a simple sentiment, yet so full of human complexity. Other apes don't have that sentiment. (p.1)

In the process of elaborating on that motif, we get to peer over the abyss into the nature of art, music, consciousness, self-awareness in animals, theory of mind, cognitive anthropology (are humans natural biologists?), the wonders of robotics and, inevitably perhaps since Gazzaniga became one of the authorities on it, split brains. The long last chapter contains both a fascinating summary on the history of the discovery of how neurons work and a lengthy consideration of the rather daunting subject of brain prosthetics. The big problem for neuroscientists is, in many ways, the fact that neurons are incredibly slow by the standards of silicon technology, yet the brain can sometimes come to the right decision with electrifying speed. Humans *can* occasionally outplay IBM's *Deep Blue* computer at chess, despite the stunning speed with which *Deep Blue* can search through all the possible moves on a chessboard.

Gazzaniga, like most neuroscientists, is not in favor of the view that the brain is "just a computer." This seems to be a reaction against the claim that the brain is literally a computer, with a Windows operating system and all. I can never quite understand this, since it has always seemed to me obvious that the brain is not metal and silicon hardware and doesn't crunch laboriously through all possible alternatives in the way *Deep Blue* does when playing chess. Yet

that doesn't detract from the fact that what the brain does is to compute and compare. The brain surely is a computer—by analogy, even though certainly not by homology. And this has led some AI folk to wonder whether we shouldn't be using biological models in the design of computers. Gazzaniga is somewhat neutral on that. But he does enthuse over Jeff Hawkins' view that the brain is just a big memory bank: "The brain doesn't 'compute' the answers to problems: it retrieves the answers from memory... The entire cortex is a memory system. It isn't a computer at all" (p. 367). And that, he argues, is how a very slow kind of wiring (nerves) can sometimes come up with the right answer so fast. Interesting, but I remain to be convinced.

But what *is* it that sets us apart? Part of the essence of what it is to be human, Gazzaniga suggests, lies in the fact that we are the only species that can reason and form beliefs about unobservable forces (aka gods), creating explanations for events in terms of imperceptible things (including, at the other end of the scale of course, such nebulous concepts as gravity). That is not, we learn, to be confused with consciousness, since consciousness—in animals as much as humans—is just an emergent property of the way the neurobiology works. That is something thrown into stark relief by the experiences of split brain patients. They don't "miss" the other half of their brain that they no longer have access to. They don't even realize that they have lost it.

The approach is broadly modular in the evolutionary psychology sense, so most readers of this journal will find this a congenial read. I found it packed full of new material I hadn't been aware of, especially on the neurobiology side. That said, I did find the chatty fraternity locker-room writing style rather irritating – but perhaps that's just my hang-up.