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Rethinking Thinking

How a lumpy bunch of tissue lets us plan, perceive, calculate, reflect, imagine—and exercise free will.

By **RAYMOND TALLIS**

The world of academe is currently in the grip of a strange and worrying –epidemic of biologism, which has also captured the popular imagination. Scientists, philosophers and quite a few toilers in the humanities believe—and would have the rest of us believe—that nothing fundamental separates humanity from animality.

Biologism has two cardinal manifestations. One is the claim that the mind is the brain, or the activity of the brain, so that one of the most powerful ways to advance our understanding of ourselves is to look at our brains in action, using the latest scanning devices. The other is the claim that Darwinism explains not only how the organism *Homo sapiens* came into being (as, of course, it does) but also what motivates people and shapes their day-to-day behavior.



A composite of X-ray and CT scans showing a human brain and the cerebral and left common carotid arteries.

These beliefs are closely connected. If the brain is an evolved organ, shaped by natural selection to ensure evolutionary success (as it most surely is), and if the mind is the brain and nothing more, then the mind and all those things we are minded to do can be explained by the evolutionary imperative. The mind is a cluster of apps or modules securing the replication of the genes that are expressed in our bodies.

Many in the humanities have embraced these views with astonishing fervor. New disciplines, prefixed by "neuro" or "evolutionary" or even "neuro-evolutionary," have been invented. "Neuro-aesthetics" explains aesthetic pleasure in terms of activity in certain parts of the brain observed when people are enjoying works of art. A propensity for aesthetic brain-tingles, implanted in us by evolution, causes us to tingle to the right kinds of things, such as pictures of landscapes loaded with food.

"Neuro-economics" can explain why we buy things we don't need or can't afford, by identifying ancestral imbalances between the want-it center in the amygdala, deep in the cerebral hemispheres, and the wait-until-you-can-afford-it center in the prudent frontal lobes. Those toxic subprime mortgages, it appears, were in fact "neurotoxic." Conspicuous consumption and our trillion-dollar debts are due to a desire to advertise our genetic health, analogous to a peacock virtually crippled by its meretricious tail.

A brain in good working order is, of course, a necessary condition of every aspect of human consciousness, from basic perception to the most complex constructed sense of self.

Who's in Charge?

By Michael S. Gazzaniga
Ecco, 260 pages, \$27.99

It does not follow that this is the whole story of our nature—that we are just brains in some kind of working order. Many aspects of everyday human consciousness elude neural

reduction. For we belong to a boundless, infinitely elaborated community of minds that has been forged out of a trillion cognitive handshakes over hundreds of thousands of years. This community is the theater of our daily existence. It separates life in the jungle from life in the office, and because it is a community of minds, it cannot be inspected by looking at the activity of the solitary brain.

Biologism commands acceptance in the humanities because it is promoted or endorsed by scientists whose prowess in their chosen field seems to qualify them to pronounce on what are essentially philosophical questions. Thus it is notable when two books written by neuro-biologists of the greatest distinction are nonetheless critical of the simplifications—both scientific and philosophical—of biologism. Both authors look outside the conceptual frameworks upon which biologism depends.

"Incomplete Nature: How Mind Emerged From Matter" by Terrence Deacon, a professor of neuroscience and anthropology at the University of California, Berkeley, does not deliver on its subtitle, but the author acknowledges the depth and complexity of the problem. This mighty work of scholarship is long, slow-moving and peppered with neologisms, but it is infinitely preferable to the flashy tomes of the Professors of Legerdemain who assure us that the mind could emerge from matter in the brain "just like that" simply because "the brain is the most complex object in the world."

Incomplete Nature

By Terrence Deacon
Norton, 602 pages, \$29.95

Along the way, Mr. Deacon demolishes fashionable computational theories of the brain. —Anyone in the future who is tempted to assert that "the mind is the software of the brain" should reflect on Mr. Deacon's observation that the apparent agency of a computer "is just the displaced agency of some

human designer." The use of simplistic analogies to make the mind look machine-like and machines mind-like and thereby solve the mind-brain problem should never again pass unchallenged.

In his approach to the question of how sentience emerged from "dumb" and "numb" matter, Mr. Deacon mobilizes some radically new ideas, taking us back to thermodynamics to show how it might have happened. His key argument, developed over several hundred pages, centers on what he calls a "teleo-dynamic" system—a self-organizing system that "promotes its own persistence and maintenance" by modifying itself "to more effectively utilize supportive extrinsic conditions." He suggests how such a system might spontaneously arise out of thermodynamic processes, as predicted by chaos theory.

Living organisms are such self-organizing teleodynamic systems, and they have a key property. He calls this the absential. An absential is a phenomenon "whose existence is determined with respect to an . . . absence." This sounds somewhat opaque but captures something essential to mind. In the push-pull universe of —mechanical causation, only that which is present shapes the course of events. In our lives, by contrast, we are always taking account of things that are no longer present or not yet present or that may never come to pass. Thus "absentials" include our beliefs, the norms to which we subscribe and those great silos of possibility such as "tomorrow" and "next year."

But absentials long precede human consciousness, Mr. Deacon claims. All "teleodynamic systems" are shaped and defined, in great part, by the constraints placed on their development. The constraints are evident in the directed development of organisms or the limited patterns of behavior they may exhibit: Living matter is, as it were, "railroaded" along certain paths. It is through these constraints that, ultimately, "that which is not" asserts its power. Mind emerged not from matter, Mr. Deacon concludes, but from the constraints on matter. These constraints then shaped the emergence of brand-new "higher level" properties—mind and thought—that are not

susceptible to reduction.

This argument is not entirely persuasive, precisely because Mr. Deacon sees absentials as defining properties of both life and mind, reaching all the way down to brainless organisms, to which he, surprisingly, ascribes sentience. But brainless complex systems do not experience their own development, or the constraints on their development, in the way that you or I experience the possibilities that shape or constrain our behavior. Mr. Deacon acknowledges that the form of sentience found in animals is different from that of humans but asserts somewhat gnomically that it is "a form of sentience built on sentience."

The author thus takes us from matter to life, but still not from life to mind, even less to the human mind. He asserts that specifically human consciousness emerges from "the flux of intercellular signals that neurons give rise to"—without making it clear how this happens. The word "signals" jumps out: Elsewhere the author criticizes the homunculi (little men), making quite difficult determinations, that pervade putative neuroscientific accounts of the mind; there is more than a hint of a homunculus in the notion of neurons that "signal" to one another. We are back with the old ways of thinking, manifested by a tendency to generate persons from the material world simply by personifying what is happening in living matter.

One of the founding fathers of cognitive psychology, Jerry Fodor, has argued that to solve the puzzle of conscious experience "there's hardly anything we may not have to cut loose from." Mr. Deacon has not cut loose from quite enough yet—in particular from the notion that matter organized in a certain way must be mindful—but he has started to reframe the terms of the discussion. His 500 densely argued pages testify to his awareness of the intractability of the problem.

Where Mr. Deacon looks backward to thermodynamics for answers about the mind, Michael Gazzaniga's "Who's in Charge?" suggests that we look elsewhere—outward, to the human world beyond the stand-alone brain. Mr. Gazzaniga is a towering figure in contemporary neurobiology. It was he who, back in the 1970s, coined the term "cognitive neuroscience"—with colleague George Miller—in the back seat of a New York taxi.

Unlike many in his profession, Mr. Gazzaniga is philosophically sophisticated. He believes that, while the brain "enables" the mind, mental activity is not reducible to neural events. While he states that thoughts, perceptions, memories, intentions and the exercise of the will are emergent phenomena, he adds that "calling a property emergent does not explain it or how it came to be."

Crucially, the true locus of this activity is not in the isolated brain but "in the group interactions of many brains," which is why "analyzing single brains in isolation cannot illuminate the capacity of responsibility." This, the community of minds, is where our human consciousness is to be found, woven out of the innumerable interactions that our brains make possible. "Responsibility" (or lack of it), Mr. Gazzaniga says, "is not located in the brain." It is "an interaction between people, a social contract"—an emergent phenomenon, irreducible to brain activity.

If the mind really were identical with activity in individual brain-bits, which were themselves machines causally wired into the material world, free will would be an illusion. One purpose of Mr. Gazzaniga's book is to reveal the implications of this mistaken notion for one of the most sinister of the neuro--prefixed pseudo-disciplines: "neuro-law." Neuro-law aims to replace the untidy processes of the current judicial system with something more biologically savvy. Isn't criminal behavior the result of (abnormal) brain function? If so, the brain, not the defendant, should take the rap.

Mr. Gazzaniga will have none of this, and he deplores "neuroscience oozing into the courtroom." The author savages the uncritical use of neuro-technology in court and laments that juries and judges have little idea of the shakiness of the connections—between minor abnormalities on brain scans and the commission of a particular crime. Neuro-law is not merely premature; it overlooks the fact that, as Mr. Gazzaniga says, "we are people, not brains," and brain scans tell us little about our personhood.

Mr. Gazzaniga's incomparable knowledge, along with his mastery of the art of making things clear without oversimplifying them, means that "Who's in Charge?" is a joy to read. Is his book, along with Mr. Deacon's, an indicator that the mighty edifice of philosophically naïve conventional neuroculture is starting to fall apart? Are these books harbingers of a better future in which the task of trying to make sense of what we are is not hampered by a reductive scientism that identifies us with the activity of brains evolved to serve evolutionary success? I hope so. While we are not angels fallen from heaven, we are not just neural machines. Nor are we merely exceptionally clever chimps.

—Dr. Tallis's latest book is "Aping Mankind: Neuromania, Darwinitis and the Misrepresentation of Humanity" (Acumen).

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