

## Book Review

Norman Doidge.

*The Brain that Changes Itself: Stories of Personal Triumph from the Frontiers of Brain Science.*

New York: Viking, 2007.

Reviewed by Howard A. Doughty

The worst thing about this book is its title, or at least its subtitle. As it stands (or perhaps as it was created by some marketing team), it smacks of Oprah Winfrey at best and *The National Inquirer* at worst.

Still, I had heard some charming things about it, and quickly got past the cover. Inside, I found a modest but well-written, knowledgeable and serious account of what we are now learning about our brains. Dr. Doidge (he is an MD who divides his time between the Department of Psychiatry at the University of Toronto and the Center for Psychoanalytic Training and Research at Columbia University in New York) is one of those rare writers who can talk to the intelligent laity with clarity and without condescension. His subject matter may be difficult, but he can educate us without dismantling either his vocabulary or the complexity of his topic. Testimony to his competence as a popularizer (a term which ought to be held in higher esteem than it is among the academic aristocracy) comes in the form of several Canadian awards for magazine writing.

I am not the first reviewer to compare Doidge to Oliver Sacks, the quintessential teller of psychiatric tales. Nor am I the first to acknowledge (against my better scientific judgement) that case studies are probably essential to the study of psychology and psychiatry, but that they are the very essence of psychoanalysis. What else is there? So it is that I am quite prepared to forego my predilection for aggregate data analysis in the social sciences and sit down to read engaging, revealing and instructive stories.

These Doidge provides, each with a specific part of his serious scientific project to reveal. The scientific project is the explication of neuroplasticity. Many human sciences have relied on metaphors drawn from larger or at least external domains. In the age of industry, we likened ourselves to machines. In the age of electronics, we compared ourselves to circuit boards. While convenient, such literary devices at best oversimplify and more often distort the way that our mind-body works.

Happily, as one commentator put it, “you don’t have to be a brain surgeon” to understand Doidge’s explanations and applications of the concept of neuroplasticity. What some may ask is, other than common curiosity, why should we care?

The answer is surely that understanding better how people think is important to understanding how people act, and understanding how we think and act is nothing less

than core knowledge for anyone interested in public policy development and implementation.

More of this later; for now, let us look at the book. At first glance, it would be possible to mistake Dr. Doidge for a “faith-healer.” He begins by alluding to a scientist who had “enabled people who had been blind since birth to begin to see, another who enabled the deaf to hear ...” There were people who’d recovered from strokes, had learning disorders cured, improved their IQs and overcame previously incurable obsessions and traumas. And, they did it by having their brains “change its own structure and function through thought and activity.” It could learn its way out of a problem and recover from both physical and emotional trauma seemingly as an act of will. Well, almost.

Despite the introductory hyperbole, the fact is that the essence of the case is scientifically accurate and proven in a host of instances. Self-administered brain reconstruction, of course, is not only a poor way to describe brain plasticity; at the same time, what neurologists have learned is nothing short of astounding. I’ll let Oliver Sacks toot Doidge’s considerable horn. Since “most forms of brain damage were thought to be incurable, Dr. Doidge ... was struck by how his patients’ own transformations belied this, and set out to explore the new science of neuroplasticity by interviewing both scientific pioneers in neuroscience, and patients who have benefited from neuro-rehabilitation. ... He describes in fascinating personal narratives how the brain, far from being fixed, has remarkable powers of changing its own structure and compensating for even the most challenging neurological conditions.” There it is. No snake oil, no incantations and no guarantee. The results are astonishing precisely because they are so unusual ... so far.

To date, the successes have involved the active intervention of skilled physicians and no small amount of medical technology to assist in “recruiting” alternative neural pathways to help restore lost functions. Nonetheless, in those cases where damaged tissue has had its duties taken over by other cells in other parts of the brain, a small revolution has occurred. The defeated party is called “localizationism,” the belief that the brain is made up of many specialized parts, each with a task (decision-making, sensation, movement, emotion), that each part is set permanently in its place and that each one’s mental function is limited (it could do its own job and no other). Neuroplasticity, however, reveals that “sensory substitution,” for example, occurs when one of our senses has been disabled but our nervous systems can adapt and find different ways to do the same work.

As absorbing and uplifting as these accounts are, I found equal value in Doidge’s two short appendices. The noisy and phony dispute between nature and nurture has long muddied up philosophical and political waters and may be one of the more toxic legacies of Descartes’ unfortunate separation of mind and body. In a brief twenty-four-page section entitled “The Culturally Modified Brain,” Dr. Doidge writes some of the most sensible things I’ve recently read on the so-called “mind-body” problem or, in this version, the question of whether our minds are made up by biological inheritance or molded by education and experience. A number of compelling examples are produced to show how cultural traditions have resulted in the development of unusual neural pathways and, more important, that these can be taught! So, a community of nomadic

sea-hunters off the West Coast of Thailand were able to “teach” European children to reverse what was thought to be an innate human reflex (enlarging the pupil in the eye) and conversely restrict it some 22% underwater, thus developing the capacity to see clearly underwater without interference from refracted sunlight.

A related finding is of interest to those who possess a belief that the human brain has evolved unmodified from the Pleistocene Age. At least insofar as its localized functions are concerned, prehistoric members of our species were thought to be fixed and directly analogous to our own. In fact, however, as one of Doidge’s heroes, Michael Mezernich, put it: Our brains are vastly different, in fine detail, from those of our ancestors ... In each stage of cultural development, the average human has had to learn complex new skills and abilities that all involve massive brain changes.”

The implications for understanding such issues as sublimation and civilization, cross-cultural communications and such important contemporary questions as how information technology from telephones to iPods are changing our brains are enormous.

This leads to an even shorter, six-page treatment of “plasticity and the idea of progress.” Building on the conjunction of Jean-Jacques Rousseau’s notion of the *perfectibilité* of humanity and the Marquis de Condorcet’s new-fangled notion of “progress,” a revolutionary new theme in social and political thought arose which has set one of the most profound and paradoxically futile subjects for political discourse in the past two-and-a-half centuries. Arrayed on the left end of the political spectrum are those who think humanity to be infinitely malleable and, hence, perfectible; against them stand those who, whether they conceive human nature to be a matter of God’s design, genetics or both, argue vehemently that an unfettered belief in human progress is an illusion, and a dangerous one at that.

No question is more pertinent to the matter of innovation than the degree to which we are, as individuals, as societies or as a species constricted or free to be other than what we seem now to be.

The larger part of *The Brain that Changes Itself* deals with cortical and subcortical remapping of neuronal circuits under processes of goal-directed experiential therapeutic programs. It relates also to instances of neurogenesis, the spontaneous regeneration of new nerve cells, especially in the hippocampus and the olfactory bulb. These concern innovation in medical and psychological settings and have obvious links to issues being addressed by educators, health care professionals and others with specific interests in how the mind works. No one, however, can be indifferent to the larger political and philosophical concerns and fail to engage the question: Who or what are we ... really?

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