

SCIENCE

The Woman Who Changed Her Brain, Barbara Arrowsmith-Young

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Barbara Arrowsmith-Young is the author of *The Woman Who Changed Her Brain*.

The Woman Who Changed Her Brain

And Other Inspiring Stories of Pioneering Brain Transformation

By Barbara Arrowsmith-Young

Free Press, 256 pages, \$26

It is hard to imagine that just a few years ago, the hot topic of neuroplasticity was mostly unknown beyond research circles. In 2007, *The Brain That Changes Itself*, a bestseller by Toronto psychiatrist Norman Doidge, did much to take the difficult concept mainstream.

The biggest paradigm shift in the science of the brain over the past 30 years, neuroplasticity banished the belief that the brain is an unchanging machine that is hardwired in childhood. We now know that the brain is dynamic, plastic, constantly remoulding itself – an immeasurable discovery for sufferers of several ills, including stroke, pain and even obsessive-compulsive disorder.

One chapter in Doidge's book, *Building Herself a Better Brain*, helped the idea hit home. It told of an extraordinary educator, fellow Torontonian Barbara Arrowsmith-Young, in many ways the Helen Keller of neuroplasticity. Unable to understand cause and effect, logic or time as a child, she was dismissed by her teachers as a "slow" kid who would need aid her whole life. Yet, by painstakingly reading and rereading books by Russian neuropsychologist Aleksandr Luria, Arrowsmith-Young developed brain exercises that lifted the fog of her cognition – and then founded a school to teach them to others.

The woman in that chapter at one time could not see the relationship between the large and small hands of a clock. Until her late 20s, she could not understand news broadcasts, which went too fast for her to grasp. Thanks to problems at the intersection of the temporal, occipital and parietal lobes in her brain's left hemisphere, the world was a jumble of unrelated parts. She has now gone on to write her own incredible story in *The Woman Who Changed Her Brain*. The book's existence is near-miraculous in and of itself, even before we consider what's between its covers.

The clocks were her "Aha!" moment. Twenty-seven and unable to tell time, Arrowsmith-Young forced herself to draw clock faces. She drew the hour hand and the minute hand, willing her mind to grasp the relationship between them. One completed, she drew another. And another.

"I would do the exercises every day for up to twelve hours a day," she writes. "The work I did with flash cards activated that moribund part of my brain, getting the

neurons to fire in order to forge new neural pathways."

Mere months later, she found herself looking at her watch not with despair, but understanding.

To anyone fond of the 1966 classic science-fiction novel *Flowers for Algernon* (or the film version, *Charly*), the fictional diary of a mentally disabled man whose IQ skyrockets after an experimental surgery, *The Woman Who Changed Her Brain* will seem an amazing real-life counterpart.

But fact here is stranger and better than fiction. Arrowsmith-Young relied on no surgeon or doctor but herself. Hers was and is a singularly determined mind that pulled itself up by its bootstraps – those bootstraps being her extraordinary memory, which was in the 99th percentile, and her powerhouse work ethic.

Arrowsmith-Young explains some of the most complex neurological concepts in a personal and breathtakingly simple way. Her simplicity is organic: She's no scientist artificially dumbing down her research for the layman. She had to break down these ideas for herself first, and she's now passing on the fruit of her difficult years of labour.

Draining her savings account, she and her then-husband founded a school, Arrowsmith, in 1980, filling it with Salvation Army furniture. She invented new exercises, working on her own learning challenges and her students' at the same time.

Arrowsmith's reputation grew with the numbers of graduates. When one of Doidge's patients mentioned the program, he visited it, tried out the brain exercises himself – and found, to his surprise, the first practical impact of the theory of neuroplasticity in a clinical setting. Today, there are 35 Arrowsmith Programs in schools all over Canada and the United States, with more soon to launch.

Arrowsmith-Young wraps up her account of her work with a bold vision for the future: an education system with cognitive exercises as a core part of general instruction. Built-in programs would boost the abilities of challenged kids, and benefit every other student as well.

"Cognitive exercises, utilizing the principles of neuroplasticity, will become an integral part of each school's curriculum," she writes. "There is beauty and majesty in this work, and I am passionate about its ability to change and improve lives."

Considering that Arrowsmith-Young is a living example of her dream, it is hard not to hope it some day becomes real.

BOOKS ON BRAINS

The number of recent books about the brain is dizzying, but here are some of the best entries in a crowded field.

Self Comes to Mind

Constructing the Conscious Brain, by António Damásio (2010)

One of the leading figures in the understanding of the brain tackles a perennial problem at the intersection of philosophy and neuroscience: How does the physical mass of synapses, ganglia and dendrites that is the human brain produce individual, subjective consciousness? The author of the award-winning *Descartes' Error* may not solve the quandary, but he inches closer, theorizing that consciousness results from the encounter between the self and the unconscious mind.

The Tell-Tale Brain

Unlocking the Mystery of Human Nature, by V.S. Ramachandran (2011)

A San Francisco brain-surgery patient begins to produce beautiful paintings after recovering. A 60-year-old has a stroke, and recovers but without the ability to recognize faces. V.S. Ramachandran, who heads the Center for the Brain at the University of California, San Diego, plays at being the detective of neuroscience, exploring cases where brain traumas led not only to dysfunction, but to unexpected gifts.

The Mind's Eye

By Oliver Sacks, 2010

In fascinatingly weird case studies that engage like short stories, neurologist Oliver Sacks tells of people whose brain disorders illuminate the way our minds work. He includes his own struggle with his loss of stereopsis, or the ability to see in three dimensions, a personal touch that makes *The Mind's Eye* powerful.

Proust Was a Neuroscientist

By Jonah Lehrer, 2007

Did 19th-century novelists, poets and painters have the intuition to anticipate scientific discoveries yet to occur? Popular science writer Lehrer's latest title, *Imagine: How Creativity Works*, may be getting the lion's share of attention now, but this book, published when he was just 25, contains his sharpest insights – such as his argument that author Marcel Proust predicted future scientific research into memory.

Sarah Barmak lives in Toronto and writes about culture and ideas.

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