The Brain That Changes Itself by Norman Doidge

'We must be learning if we are to feel fully alive.'

One of the many glowing reviews of this book described it as *'An inspiring book that will permanently alter the way we look at human possibility and human nature.'.* It sounds like hype but I found it to be true. Almost every chapter contained information that changed my thinking, stories of people who inspired me, or practical advice for learning skills. The central message of the book (messages are unusual in a science book) is summarized by the quote above: we must continue to learn new skills if we want our brains to remain active.

Plastic Brain Theory

The central idea of this book is that the brain is a plastic, living organ that can change its own structure and function, even into old age. Norman Doidge presents case histories of people whose conditions had been dismissed as hopeless, but eventually recovered brain use. He also meets the scientists who have developed the theory and practice of brain plasticity.

For years it was thought that the human brain was like a hard-wired machine; '*a computer made of meat*.' Science taught that the human brain remained fixed after childhood, and then slowly deteriorated; and that it also had separate specialized parts for vision, hearing, etc. Of course there were a few forward thinkers, such as Rousseau (about 1762) who maintained that aspects of our nature are changeable.

The theory of brain plasticity teaches that the brain is quite dynamic, and that it can re-organise itself if the need arises. This gives some hope for people with strokes, schizophrenia, learning disabilities, depression and addiction; as well as for all of us as we age.

Doidge also shows how science itself can change over time as new discoveries (previously considered unimaginable) are made. Of course it must be

remembered that the brain plasticity concept is ‘cutting edge’ science and it may be many years before these new techniques are widely available.
One system that is currently available is called Posit Science. These exercises train the brain in the memory of words and language. This computer based package can be purchased online (see Further Reading section). These brain exercises seem to sharpen thinking well into old age.
As we get older, Doidge recommends any kind of learning or experience that requires us to develop completely new skills, especially those that involve genuine concentration. For example, learning a new language, studying a musical instrument, reading and dancing. Much of the advice here is common sense – such as ‘*physical activity is helpful*.’
The book covers a very wide range of practical areas from aging, to stroke recovery and depression. I have chosen to touch briefly on education, imagination, love and addiction in these notes.

Education

There are significant implications for the whole education system in this book. Teachers will find much to ponder about both how we teach and what we teach. Chapter Two outlines the case study of a woman labelled ‘retarded’ who cured her own deficits with brain exercises and now cures the learning disorders of others. Her ‘Arrowsmith’ approach involves targeting weak areas of the brain with a strengthening programme.
These kind of repetitive programmes used to be the basis of much education in the past. This included such things as rote memorizing of poems and maths sums, elocution (speech training), and handwriting drills. Since about the 1960s, schools have tended to drop these drills in favour of a more relaxed, ‘trial and error’, approach to learning. Doidge thinks we should revive the old fashioned drills, and he suggests that they were *‘the only opportunity many students had to systematically exercise the brain function that gives us fluency and grace with symbols.’*

As a teacher trained in the new 'creative' system, I found this difficult to accept at first. But I reflected on the many children (especially boys) that struggle at school early on, and I think this system would benefit their early development. On the other hand, there are many children that suit the more open-ended learning structure.

Imagination

In Chapter Eight, Doidge looks closely at imagination and brain science, particularly at how it impacts on learning. The fascinating experiments show how imagination to be a powerful tool. It can induce muscle strength without actually exercising; help people learn a piece of music; or win at chess.

Doidge shows how mental rehearsing and visualising are effective ways to prepare for learning a physical skill. It seems that imagination and action are closely linked: they activate many of the same parts of the brain. This presents opportunities and problems. It means that learning can be assisted by imagination, but it can mean we get stuck: *'The mental tracks that get laid down can lead to habits, good or bad.* He suggests that a 'roadblock' of some kind may be needed to get us to change direction. He gives the example of an experiment which blindfolded people, making their brains develop new pathways.

The power of imagination has implications for areas such as education and self-motivation. Imagination is certainly an under-used tool in schools. Children could be encouraged to exercise their imaginations fully before learning new skills or writing stories.

Doidge's brain research also lends credibility to the popular motivational concept 'the power of positive thinking'. If action and thought are so closely integrated perhaps there's some truth to the visualisation method.

But Doidge also reminds us of the 'tortoise-and-hare' effect. It seems that old-fashioned hard work still pays off in the long term: '*Maintaining improvement and making a skill permanent require the slow steady work that probably forms new connections.'*

Love

'*Romantic love is such a powerful catalyst for plastic change'* because our brains are experiencing a surge of dopamine, the feel-good chemical. So how do couples maintain a good feeling about their relationship after many years of marriage when things have become too predictable? Doidge suggests injecting novelty into the relationship. This might be going on a holiday, wearing new clothes, learning a new skill together, or surprising each other. Novelty turns on the pleasure centres in the brain and '*everything they experience, including each other, excites and pleases them.*' The main thing it seems is to avoid predictability in a relationship.

Doidge says one of the most important messages of the book is what he calls the '*plastic paradox*'. This means that our plastic brains can make us either more flexible or more rigid in our behaviour. For many of us '*the spontaneity, creativity, and unpredictability of childhood gives way to a routinized existence*.'

Addiction

The darker side of this rigidity is perhaps compulsive behaviour and addiction. It can be crippling, because the brain seems locked. But Doidge has some interesting suggestions about how to deal with anxiety disorders and obsessions. The first step is called 'relabelling' the problem, to get some distance from the content of the obsession. The second step is called 'refocussing' which involves doing some positive, enjoyable activity to replace the obsession: *'by doing something pleasurable in place of the compulsion, patients form a new circuit that is gradually reinforced instead of the compulsion.'*

Style

You wouldn't think style mattered in a non-fiction book, but it does. It is not easy for a writer to translate complex scientific ideas into plain language for a non-scientific readership. The major pitfall of 'popular science' is an over simplification of the science that leads to gaps and half-truths. Doidge successfully avoids

these traps to produce a book that has both a fluent style and understandable science.

I think he achieves this because he first and foremost a good writer. He's had extensive experience writing articles, essays and even poetry. It shows in his choice of words and imagery, especially metaphors that help the reader imagine a concept:

'The brain is not an inanimate vessel we fill; rather it is more like a living creature with an appetite.'

'What is a trance but the closing down of the gates of pain within us.' 'If the brain is like Play-Doh, how is it that we remain ourselves?'

It helps too that Doidge is obviously an expert, but he an expert who has retained his sense of wonder: *'The brain is a far more open system than we ever imagined.'* He also has great affection for the people he interviewed and he tells their stories in a personal manner. The effect is to engage the emotions of the reader in a way that most scientific texts do not (Oliver Sacks is also adept at making this connection with readers).

Doidge also integrates several branches of science. His experience as a psychoanalyst means that he can draw on the less tangible but emotionally satisfying inner lives of his patients.

Brief Biography

Norman Doidge, M.D., is a psychiatrist, psychoanalyst, researcher, author, essayist and poet. He is a native of Toronto. At the University of Toronto, he studied classics and philosophy, and graduated with high distinction, then earned his medical degree.

In 1994, Doidge won The Canadian Broadcasting Corporation/ Saturday Night Literary Award for his personal memoir, "The Suit."

His article about the Nobel laureate Saul Bellow, called "Love, Friendship and the Art of Dying," was named best article published in Canada in 2000.

He is the author of standards and guidelines for the practice of intensive psychotherapy that are widely used in Canada. Dr. Doidge has won many

scientific awards, including the Mary S. Sigourney Prize, the highest award in international psychoanalysis.
He is currently on the Research Faculty at Columbia University's Center for Psychoanalytic Training and Research, and the University of Toronto's Dept of Psychiatry.

Further Reading and Viewing:
The Man Who Mistook His Wife for a Hat by Oliver Sacks. This and other books by Sacks are similar to Doidge's book in that they are both authoritative and accessible to non-science readers.
Descartes' Error: Emotion, Reason, and the Human Brain, by Antonio Damasio (1994). Examines the traditional 'mind-body' split.
The Emotional Brain by Joseph Le Doux is about how the brain makes emotions.
Walking in this World by Julia Cameron (2002). A non-scientific, practical approach to 'unlocking your creative potential'.
Posit Science: a language-based Brain-Fitness Program developed by Dr. Michael Merzenich: http://www.positscience.com
A film of *The Brain That Changes Itself* has been released. It won the 2009 World Fest-Housten International Film Festival Jury Award.

Questions
1. Doidge says we tend to become either more rigid or more spontaneous as we age. Do you agree?
Do you feel as though your brain (or thinking) is becoming more fixed or more flexible?

2. Are there areas of your learning or thinking that you would like to change?

3.Did you find that this book changed your thinking in some ways? Discuss why or why not.

4. Which of the case histories was most memorable for you? Why did you relate to it?

5. Much of the science confirms common sense ideas such as : ‘practice makes perfect’ for any skill; ‘sleeping on a problem’ helps to solve it; and for addicts, ‘the more you do it, the more you want to do it’. Try to define common sense and discuss its role in life.

6. Think about your experience at school. What kind of teaching or learning was practiced: rote learning or more open-ended? Discuss the strengths and weaknesses of both systems.

7. Are you a tortoise or a hare (page 200) when it comes to learning new skills (or studying for exams).

8. In what ways could you use your imagination to enhance some aspect of your learning or life?

9. Do you agree that ‘predictability’ can damage a relationship? To what extent is this true in your opinion?

10. This is ‘cutting-edge’ science. Should we always believe what scientists say? Discuss the role of science in today’s highly technological world. Should it be limited in any way?

Notes by Raymond Huber