

Neuroscience in disguise



Billy's Halo

By Ruth McKernan

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Reviewed by Charvy Narain

Evolutionary biology has Richard Dawkins, and physics has Steven Hawking, but popular science books written by working neuroscientists are (with a few notable exceptions) a rarity. A new entry in this field, Ruth McKernan, has received glowing praise from the popular press for her first book, an autobiographical account of her father's last year, interspersed with her musings on how biology and neuroscience make sense of his condition and her reactions to it.

McKernan is a natural choice to write a best-selling popular neuroscience book. She trained as a biochemist, receiving a Ph.D. for her work on the molecular mechanisms behind antidepressant drugs. During a short sabbatical when she worked as a journalist for the British newspaper *The Independent*, her neuroscience articles won the Glaxo/Association of British Science Writers award, one of the most prestigious British science writing prizes.

Whether her writing works equally well for hard-nosed neuroscientists is another question. McKernan slips nimbly between her dual roles as a diarist and a science writer and clearly excels at both. Her affection and anxiety for her father, William McKernan (known to everybody as Billy), as he slowly dies from leukemia are clear, as is her skill in describing scientific concepts. In one memorable passage, she compares the streptococci that infect him to the British newspaper columnist Julie Burchill, nicely communicating their virulence, as well as the admiration they evoke for their versatility and skill. In another, she explains the need for programmed cell death in developmental processes through the analogy of a carpenter using his saw and sandpaper to make a chair. The book is arranged roughly like a basic (if somewhat idiosyncratic) neuroscience primer, with chapters on memory, consciousness, mood and genes, peppered with the work of well-known neuroscientists. Jeffrey Gray attempts to define consciousness as Billy's consciousness slips away. Joseph LeDoux's work on emotions helps explain the vividness with which McKernan recalls the events of her father's hospitalization.

Charvy Narain is an Associate Editor at *Nature Neuroscience*, 75 Varick Street, Ninth Floor, New York, New York 10013, USA. e-mail: c.narain@nature.com

Donald Hebb's work on associative learning is discussed as the family visits Billy's childhood home, and Wolfram Schultz's work on the role of dopamine in reward pops up as McKernan describes her father's native 'high drive, high dopamine' state as he briefly recovers from his illness. There is a whiz-bang tour of stem cells, brain anatomy, basic neurotransmitter functioning, stress responses and finally, as Billy dies, apoptosis. All of this is intermixed with reminiscences about the McKernans' family life, along with a running account of Billy's illness, recovery and final relapse.

Much of the research will be well known to working neuroscientists, and this book is not the one to pick up to learn about cutting-edge studies. Some of the expositions can drag a bit for readers who are familiar with the field, such as the discussion of the differences between declarative and procedural memory. This problem is actually made worse by the excellent writing skills on display here: I felt a pull to skip over the familiar science to read about the heart of the book, which is essentially an elegy to her father. A colleague compared this to fast-forwarding over the television ads to come back to the interesting program.

However, the book cuts through a broad enough swath of neuroscience (and biology in general) that, for all but the most wide-ranging of neuroscientists, there will be something new to learn here. I, for example, learned much from the chapter on stem cells, where McKernan compares progress in stem-cell research to her father's own recovery: one big step forward followed by an unknown number of steps back. Her summary of the key findings, their neuroscience applications, and the accompanying ethical and technical problems is precise and non-polemical, and nicely demonstrates the skill at communicating complex ideas that won her a science-writing award. One of the last chapters, on apoptosis and cell death, is also excellent, both in explaining the reasons why cells are programmed to die and the processes by which this happens, as well as in the restrained grief with which McKernan writes about her father's impending death.

More worrying is her glossing over some of the uncertainties in research: studies are usually presented as the last word on a particular subject, without any of the caveats that accompany almost all research. In the section on neurogenesis, for example, McKernan talks about work by Fred Gage and Peter Eriksson that found evidence for hippocampal neurogenesis in adult humans, using BrdU labeling as a marker for dividing cells. This study remains a landmark, but there is much controversy about whether BrdU labeling reflects neurogenesis or not, which is not mentioned at all. Of course, this is a popular science book, a form that has different rules from a scholarly manuscript or a book, but this omission is particularly grating given the assertion in the final chapter that scientists "are 95% kind of people," rarely being 100% positive. That is not the impression that the lay reader would get from this book.

In the end, however, this book is meant for the lay reader, though no one (including neuroscientists) can fail to be touched by a daughter writing about the slow decline and death of a much loved parent. Someone who is not a biologist at all would receive a fairly thorough grounding in the basics of neuroscience by reading this book. Those of us with families to whom a neuroscientist's work is still a mystery could do worse than to slip them this slim book as a token of our affection for both our work and our families. My father is certainly getting it for his birthday. ■