David J. Linden, *The Accidental Mind: How Brain Evolution Has Given Us Love, Memory, Dreams, and God* (Cambridge, MA: Belknap/Harvard University Press, 2007), 288 pp., $25.95 (hbk), ISBN: 978-0-6740-2478-6. Review doi: 10.1558/jsrnc.v4i3.239.

This book asks some big questions. When did the first neurons appear? How do they work? Why do human brains look and function the way they do? What are the respective roles of genetic and epigenetic factors in brain architecture and operation, and cognitive function? Why and how has brain evolution given us memory, dreams, religion, and romantic love? We would be surprised if the book had all the answers—science in this area, though fast-moving and exciting, is still young and riddled with gaps. *The Accidental Mind* neither gives, nor claims to give, all the answers. Rather, it provides an introduction to current evolutionary cognitive neuroscience, making accessible to the lay reader key recent discoveries, helpfully acknowledging persistent gaps and unsolved problems.

Few could cover so much territory expertly and accessibly. Linden weaves findings from neuroscience, evolutionary biology, cognitive and comparative psychology, and cognitive anthropology into his exploration of the neural mechanisms and processes underlying complex human cognition and behaviour. His starting point is the rather counterintuitive message that complex and sophisticated minds do not require elegant and efficient brains—the brain 'is not an optimized, generic problem-solving machine, but rather a weird agglomeration of ad hoc solutions that have accumulated throughout millions of years' (p. 3). The evolution of neural mechanisms was a highly constrained process—selection could only work with and in addition to what was already there. Neural activity is therefore also highly constrained, but generally fit for purpose.

Linden aims to show how our evolved neural architecture produces several core features of human experience, such as sensation and emotion, romantic love, learning and memory, and religious perceptions. Perhaps the domain of human experience for which he does this best is memory, which, he argues persuasively, is a byproduct of a solution to a set of evolutionary problems having to do with brain size and brain development in humans. Here, Linden provides an excellent introductory description of the evolutionary pressures and adaptations, focusing especially on the operation of these adaptations at the neural level.

Linden excels at describing brain mechanisms for the layperson. He identifies phenomena about which we all have some subjective experience, such as vision or audition, and proceeds to portray key aspects of each phenomenon's neural underpinnings. But it is at times disappointing that such careful and detailed description and well-synthesized evolutionary-cognitive-neuroscience gives way to comparatively imprecise and largely mechanism-free accounts. Linden helpfully describes the brain in terms of its constituent parts. He does something similar for love—focusing on the evolution of pair-bonding in humans, sex-based differences in brain function and cognition, and the neurobiological basis of love and sex. He fails to do the same for religion. Readers hopeful for an informative, introductory synthesis to the evolutionary cognitive neuroscience of religious thought and behaviour will be disappointed by his (self-confessed) speculative treatment of 'the religious impulse', which he grounds vaguely in the narrative-constructing function of the left cortex.

Overall, Linden has provided an accessible introduction to a set of interesting, wide-ranging questions but the book is just too small to fulfil its ambitions

adequately; neural, modular, genetic, functional, cognitive, and evolutionary stories compete for space and receive uneven treatment in a book whose content seems to be primarily driven by hot topics. There is an apparent tension between describing what axon hillocks, synaptic vesicles, and dendritic spines do, and making that relevant to the things most people care about. It is a long way from an axon hillock to a culturally distributed belief in God. Title aside, this book does not pretend otherwise. Between the rare gems of research findings that illuminate the links (as Linden puts it, 'That Middle Thing') between brain and behaviour, there is vast underexplored territory. The great success of this book, then, could be in its capacity to inspire and expand future research in this exciting and challenging area.

Emma Cohen
Research Group for Comparative Cognitive Anthropology
Max Planck Institute for Evolutionary Anthropology
Leipzig, Germany
emma_cohen@eva.mpg.de