ones. For each essay Achinstein provides a response.

The quality of the contributed papers is even. Most authors provide a reasonable summation of that aspect of Achinstein's work they intend to engage with. Given the number of essays in the volume, it is not surprising that Achinstein's responses are short (typically about two pages). Inevitably this leaves some authors' objections and queries unanswered, perhaps indicating that a volume with fewer contributions and lengthier responses would have been more useful. In fairness, however, Achinstein often directs readers toward relevant papers of his that address criticisms in more detail. Furthermore, the intent of the volume is not, nor should be, a defense of or introduction to Achinstein's ideas. (A second volume, *Evidence, Explanation, and Realism*, also published by Oxford University Press [2010], collects many of Achinstein's previously published papers and is therefore a better, and worthwhile, introduction to his mature philosophical views. The two volumes complement each other very well.)

Not all papers are directly concerned with historical issues, but enough are to make *Philosophy of Science Matters* beneficial to any historian who is interested in methodological issues, the history of their evolution, or their role in shaping scientific debates. Jordi Cat is concerned with Achinstein's interpretation of Maxwell's methodology; Victor Di Fate discusses Newton's *Rules of Philosophy*, Achinstein's sympathy for them, and their plausibility; Frederick Kronz also writes on Newton's views on induction, as well as Mill's, and Achinstein's interpretation of each; Gregory Morgan challenges Achinstein's construal of William Whewell's ideas on coherence within theoretical science; Stathis Psillos and Bas van Fraassen discuss Achinstein's analysis of Perrin's experimental work and the conclusions Achinstein draws for purposes of advancing the scientific realism debate. These essays each follow Achinstein's example of careful, historically informed philosophy of science; historians interested in such issues will certainly profit.

DAVID HARKER

Raymond Tallis. *Aping Mankind: Neuromania, Darwinitis, and the Misrepresentation of Humanity*. xi + 388 pp., bibl., index. Durham, U.K.: Acumen, 2011. €25 (cloth).

Raymond Tallis's excessively long and jumbled book criticizes the neuroevolutionary explanations for human behavior and culture that have become fashionable since the 1990s. From neuroanthropology to neurotheology, the "neuro-" prefix signals the application of neuroscience (chiefly, neuroimaging) to topics hitherto researched with the tools of the humanities and social sciences. Tallis, whom an editor of Wikipedia describes as "a British philosopher, secular humanist, poet, novelist, cultural critic, and retired medical doctor," attacks what others have dubbed "neurobabble," "neuromythology," "neurospeculation," "neurotrash," or "neuromadness." Like "neuromania," these epithets signal irritation and revolt; Tallis expresses them too, but the scorn with which he sometimes does so ends up vitiating his polemic.

The neuroscientist Susan Greenfield's assertion that "our identity *is* our brain" (quoted on p. 30) encapsulates the neuroevolutionary perspective on the human. This perspective extends to the totality of human collective experience in space and time, including consciousness, art, science, politics, and religion. Since evolution has shaped brains, neuromania naturally combines with the attempt to explain everything pertaining to living organisms in terms of evolutionary advantage. More than other critics, Tallis highlights this convergence, and that is valuable in itself.

Aping Mankind, however, is weak on history, which it outlines "from Hippocrates to the BOLD Rush." "BOLD" designates the *B*lood-*O*xygen-*L*evel-*D*ependent signals measured by neuroimaging, usually interpreted (in the neuromanic universe) as neural correlates of behaviors and capacities. With many other scholars by now, Tallis sketches the methodological problems and conceptual fallacies involved in such interpretation. He also shows how neuromania lapses from correlations to causes and confounds necessary with sufficient conditions. Right on target (though often too quick) on those points, he fails in his genealogy of the belief that we are our brains. Hippocrates wrote that "from the brain, and from the brain only, arise our pleasures, joys, laughter and jests, as well as our sorrow, pains, griefs and tears" (quoted on p. 29). For Tallis, the Greek doctor claimed that the brain "is *the whole story*" (p. 30)—and thus anticipated Francis Crick's "astonishing hypothesis" by twenty-five hundred years. His narrative ignores immense differences—the first one being that "brain" meant fundamentally different things for Hippocrates and Crick. Although *Aping Mankind* is not supposed to be history, we can still regret that its historical perspective corresponds, though with a negative valence, to neuroscientists' own presentist stories.

Most of Tallis's objections will be familiar to those acquainted with discussions around the

neuroevolutionary enterprise: the circularity of experimental designs and argumentative strategies; the truistic character of empirical results and their interpretation; the lack of ecological validity of most studies; the inherent incapacity to explain consciousness by reduction; the irrelevance of most neuroevolutionary research for the objects it allegedly examines—cultural differences for neuroanthropology, beauty for neuroaesthetics, spiritual experience for neurotheology. These self-undermining features will not go away with more sophisticated methodologies or more powerful scanners but are intrinsic to the neuroevolutionary ideology. While Tallis's explanation of why this is so may be unclear, it constitutes a salutary wake-up call for the humanities.

Indeed, if the neuroevolutionary perspective is so inane, and if it is so obvious that we are persons and not brains, why care? The reason may be that the "capitulation to scientism" (p. 343) is penetrating the human sciences themselves. The belief that these sciences can eventually be replaced by their "neuro" varieties presupposes an epistemic and institutional hierarchy that leaves them at the bottom—and ultimately out. In defending the humanities against becoming "animalities" (p. 59), Tallis, who describes himself as a secular humanist, insists that he is not against neuroscience or evolution, but only against their misuses. In contrast, the philosopher Daniel Dennett sees him as indulging in "refutation by caricature" and "as a sort of outraged defender of an obsolete worldview that's losing ground fast" (Marc Parry, "Raymond Tallis Takes Out the 'Neurotrash,'" *Chronicle of Higher Education*, 9 Oct. 2011, http://chronicle.com/article/Raymond-Tallis-Takes-Out-the/129279/ [accessed 3 Feb. 2011]). Such disparaging comments perfectly illustrate the passionate *dialogue de sourds* of which *Aping Mankind* represents one side. For historians of science, it is such speaking and working at cross-purposes that in itself constitutes a fascinating object of study, yet to be fully understood.

FERNANDO VIDAL

Derek Turner. *Paleontology: A Philosophical Introduction.* (Cambridge Introductions to Philosophy of Biology.) xi + 227 pp., illus., tables, bibl., index. Cambridge: Cambridge University Press, 2011. $28 (paper).

Derek Turner's new book is a highly serviceable introduction to traditional problems in the metaphysics and epistemology of science as they arise in paleontology. As part of the new Cambridge University Press series "Cambridge Introductions to Philosophy of Biology," the book is targeted toward nonspecialists and is written in clear and jargon-free prose. Turner is unconcerned with fancy philosophical maneuvers; his goal is to highlight the fascinating intellectual landscape that characterizes modern paleontology. Mission accomplished.

The discipline of paleontology is awash with researchers who gravitate toward unconventional perspectives. This tendency has made for an exciting modern social and conceptual history of paleontology, but historians and philosophers of science have generally not taken notice. Turner is one of a very few philosophers working today who specializes in philosophical features of paleontological science.

While some philosophers of science are content with inventing and relieving fine-grained conceptual tensions that succeed in annoying rather than educating scientists and historians, Turner is not among them. His general approach, masterfully executed in *Paleontology: A Philosophical Introduction*, is to take historically significant topics in paleontology and subject them to philosophical scrutiny. By staying close to the actual science and showing how many debates in paleontology (and between paleontology and other biological disciplines) turn on distinctively philosophical fulcrums, Turner is able to demonstrate the advantage of a philosophical perspective for explaining how science works the way it does. The result is a collection of discussions that are able to unite problems that have arisen in the study of ancient life with problems that arise in other sciences, a highly salutary effect for readers interested in understanding science at an abstract level and for educators interested in imparting to their students the generality of certain kinds of problems across the sciences.

Much of Turner's book is concerned with explaining the historical origins and conceptual foundations of various aspects of theories of evolution above the species level. These theories are arguably the most distinctive features of modern paleontology, and it is appropriate that Turner devotes the lion's share of his attention to them. Two chapters are devoted specifically to the nature of and debate surrounding Niles Eldredge and Stephen Jay Gould's punctuated equilibrium model for understanding patterns in the fossil record. Turner carefully unpacks what the model does and does not say, explains how it put pressure on phyletic gradualism, and ties the model and its associated controversies to more general problems in the philosophy of science.

Turner's discussion of punctuated equilibrium leads him into an insightful exploration of