

Reviews

Biology and Ideology: From Descartes to Dawkins. Edited by Denis R. Alexander and Ronald L. Numbers. Chicago: The University of Chicago Press, 2010. 453 pages. \$35.00.

This book contains thirteen essays by leading scholars in the history and philosophy of science, religion, and theology. Following an introduction by the editors, the book moves from analyses of the authority of the natural sciences in the early modern and modern periods to an examination of a range of issues related to the history of Darwinian evolutionary theory. Each essay in its own way sheds light on how biology has been used to further ideological interests that go far beyond science. While Karl Marx (1818–83) and his followers were the first to expose the ideological abuse of science by those who sought to defend the social and political interests of the bourgeoisie, the concern to identify the (perhaps inescapable) connection between science and ideology became a major issue in the twentieth century, especially among historians of science who undermined the notion that science is a “value-neutral enterprise.” One thinks, in particular, of Thomas Kuhn’s revolutionary and best-selling book, *The Structure of Scientific Revolutions* (1962), which demonstrates that science is not a progressive, cumulative activity. Less than a decade after the publication of Kuhn’s groundbreaking study, Robert Young was defending a notion that Kuhn himself rejected, namely, that science *is* ideology, since the latter “is an inescapable level of discourse” and all definitions of reality are connected to “concrete power interests.” Less radical than this position was the general conclusion of David Bloor, one of the founders of the Science Studies Unit at the University of Edinburgh, namely, that science is always shaped and in some ways even determined by psychological, social, and cultural factors. “The social component is always present and always constitutive of knowledge.” Other scholars connected with the Science Studies Unit, such as Steven Shapin and Simon Schaffer, have come to similar conclusions that undermine the traditional separation between science and ideology. While most now reject the radical view that science is *only* a social construction, there appears to be a consensus among historians of science that ideologies do play a constitutive role in the formulation of scientific knowledge.

The essays in this volume reveal the extent to which biology, to quote the editors, “has been particularly susceptible to ideological manipulation and application, a trend that shows no sign of abating” (p. 6). Cumulatively, the authors show the various ways in which biology has been used for a variety of social, religious, and political purposes, whose outcomes “may be beneficial, benign, or harmful,” and yet whose aims are not necessarily intrinsic to biology itself.

Peter Harrison examines how the first investigations of nature were used to support traditional understandings of natural theology and a moral order. In the early modern period, the practice and status of natural history underwent transformation as the new sciences of the seventeenth and eighteenth centuries, including biology, asserted their legitimacy over Aristotelian understandings of nature, as the proponents of the new sciences argued that these sciences could

undergird moral and religious ends consistent with a humanist education, and as they paved the way for these new disciplines to become central to the scientific enterprise as a whole.

But the uses of biology in early modern Europe were not limited to the support of moral ends. Shirley Row's essay on biology and atheism in eighteenth-century France demonstrates that the study of nature could also be harnessed to materialistic arguments that were often used by the *philosophes* to undermine moral and social order. Likewise, as Peter Hanns Reill shows in his chapter, biological research was used at this same time in Britain and Germany to defend particular conceptions of nation states whose structures were understood to be analogous to living organisms.

The majority of the essays in the book examine how Darwinian evolutionary biology has been used and abused for ideological, nonbiological purposes. For example, Edward Larson revisits the emergence of the eugenics movement in the late nineteenth and early twentieth centuries, Paul Weindling examines the complex relationship between Darwinian biology and Nazi racism during the Hitler regime, and Nikolai Krementsov exposes how Darwinism was used by various Marxist factions in the Soviet Union (and not merely by Lysenko who linked socialist doctrine to his disastrous view of Lamarckian biology). Michael Ruse explores how frequently evolutionary biology has been understood to imply ideological notions of progress, despite empirical evidence to the contrary. Erika Lorraine Milam's essay discloses how biology has been used to defend notions of sexual difference and gender, such as man "the hunter" and woman "the sexually-available mother."

Building on his magisterial study of so-called "scientific creationism," Ronald Numbers summarizes the roots of anti-Darwinism in America and extends his analysis to include those creationists who want to introduce Intelligence Design theory into public school classrooms. For creationists of all kinds, Darwinism has frequently been perceived as implying an antireligious worldview that is purely and merely materialistic and naturalistic. Some public popularizers of evolutionary biology, such as Richard Dawkins and Daniel Dennett, have not helped the promotion of biology's legitimacy among such religious folk since they stridently assert that evolutionary biology is inherently atheistic. As Alister McGrath shows in the book's final chapter, the atheistic, ideological rhetoric of Dawkins will continue to subvert public understanding of science (contrary to the stated aim of his former professorship at Oxford!) and fuel anti-Darwinian positions that are also ideological in nature.

These are meaty essays that will reward the patient reader with insight and deeper understanding of the ways in which biology has been used for political, racial, social, religious, and antireligious ends that are distinct from biology itself and that have often led to truly horrific consequences. So the book as a whole serves as a helpful warning, to be wary of how biology remains susceptible to such ideological abuse.

MATTHEW BECKER
Associate Professor of Theology
Valparaiso University
Valparaiso, IN 46383
matthew.becker@valpo.edu

Principles of Neurotheology. By Andrew B. Newberg. Burlington: Ashgate, 2010. x + 276 pages. \$16.99 (paper).

Throughout the years, scientists and theologians have written about the relationship between religion and science that relied on a methodological approach that was primarily speculative in nature. Within the last 10 years, due to advancements made in brain imaging techniques, scientists are now able to formulate empirical hypotheses regarding what is happening in the brain during a religious experience. Andrew B. Newberg, M.D., Director of Research in Myrna Brind Center of Integrative Medicine at Thomas Jefferson University and Hospital, Philadelphia, is one of the first scientists to conduct extensive research on the topic of neuroscience and religious experience. Newberg's commitment to exploring the integration of neuroscience and religion began more than a decade ago evidenced in *The Mystical Mind* (1999), which he co-authored with the late Eugene d'Aquili. Since then, Newberg co-authored three additional books: *Why God Won't Go Away* (2001), *Why We Believe What We Believe* (2006), and *How God Changes Your Brain* (2009).

In his recent book, *Principles of Neurotheology*, Newberg has penned a monumental work in the field of neurotheology. Neurotheology, a term first coined by James Ashbrook, has since been borrowed by scholars in science and religion to describe research pertaining to the integration of neuroscience and religion and/or spiritual experiences. Since Ashbrook's article first appeared in 1984, many scholars have made important contributions to the field of neurotheology but none has articulated a clear set of principles to direct this relatively new field. This apparent lack of direction is what prompted Newberg to write a book that would lay a foundation on which neurotheological research could be constructed. In this light, neurotheology could be shown to be a legitimate academic discipline that is mutually beneficial to the scientific and religious communities.

Principles of Neurotheology is an intellectually ambitious book about a set of foundational principles suggested by Newberg to help guide the field of neurotheology that is grounded in empirical research and couched in an ideology that encourages multidisciplinary research. It is a challenge for a scholar to retain a comprehensive knowledge of his or her area of expertise let alone master two as hundreds of neuroscientific and religious articles are produced weekly. Nevertheless, it is clear that Newberg has indeed become an expert in two seemingly polar fields. One cannot espouse a set of principles and definitions addressing the multidisciplinary issues that comprise the field of neurotheology without having an intimate understanding of the breadth of scholarship that is fundamentally significant to each field. In terms of the degree to which a book ignites a paradigm shift within the scientific and religious communities, Newberg's *Principles of Neurotheology* is as significant as Alfred North Whitehead's *Process and Reality*. It is an essential read for anyone interested in gaining an in-depth knowledge of the controversial yet promising field of neurotheology. It provides a foundation for those interested in advancing the relationship between the brain and religious experience, and allows a starting point for those

who may be hesitant to explore ways in which neuroscience and religion can co-evolve.

TIFFANY DEMKE
Lutheran School of Theology
Chicago, IL 60615
neurotheology@yahoo.com

Philosophy, Science and Divine Action. Edited by F. LeRon Shults, Nancey Murphy, and Robert John Russell. Leiden/Boston: Brill, 2009. vi + 443 pages. \$212.00.

There is no way to do any justice in a brief book review to this remarkable volume containing ten extensive essays by outstanding scholars in the fields of mathematics, physics, astronomy, philosophy, and theology on the topic of the intelligibility of divine action in light of findings of modern sciences such as quantum physics and chaos theory. A listing of the contributors' names has, therefore, to serve as a shorthand indication of the quality and truly amazing depth of many of the reflections published therein. I. G. Barbour, A. R. Peacocke, J. Polkinghorne, W. R. Stoeger, W. J. Wildman, P. Clayton, Th. F. Tracy, N. Murphy, G. F. R. Ellis, and R. J. Russell supplied the papers, while F. LeRon Shults prefaced the volume with a "Philosophical introduction to 'Divine action'" (1–15).

This introduction along with the historical background information provided by R. J. Russell in the Appendix (407–26) will best get the noninitiated readers right into this demanding discourse between contemporary sciences and current reflection in Christian (philosophical) theology. Except for the introduction, all essays had served previously as critically reviewed and reworked material for discussions on divine action in a very ambitious, grand scale international dialogue stretching over a period of twenty years between scientists, philosophers, and theologians sponsored jointly by the Center for Theology and Natural Sciences, Berkeley, California, and the Vatican Observatory, Rome, Italy. The papers, thus, represent the end result of a critical process among participating peers of the said project. To honor them appropriately would require examining the individual contributions in detail that is beyond the scope here. The reviewer therefore can only point to some basic general aspects.

This book makes very stimulating reading for versatile readers who are willing to engage in arduous intellectual pursuits in philosophy, modern sciences, and theology such as quantum physics (indeterminism; field theory), complex systems (autopoiesis), chaos theory, and their bearings on the concept of divine action and intervention (resurrection, miracles) as commonly understood in Christian theology. What is missing, however, is a principal reflection on the hermeneutical issue that lies at the root of any "dialogue" across the aisle of science and theology. Robert Russell, who served on the steering committee of the project (together with Murphy and Stoeger), remarks in passing that "often the conversations got bogged down over terminology" (410). Nevertheless, it is quite a different matter to talk conceptual definitions or hermeneutics that addresses the basic differences and incompatibilities of the diverse language worlds of science and theology. There

is, of course, some explanation while this issue has been left out, because the project is heavily indebted to the Roman Catholic theological tradition (see R. Russell's remarks 407–10) with its characteristic emphasis on natural law or law(s) of nature, respectively (236f, 263f, 277f, 420). This omission resulted in tainting several papers unduly apologetic, such as Wesley Wildman's on "Evaluating the theological argument for divine action" (141–89), Nancey Murphy's on "Divine action in the natural order" (263–303), and George Ellis's on "Ordinary and extraordinary Divine action" (305–49) to name just a few. The authors' obvious interest appears not to be genuine dialogue with science, which they claim to do, but to demonstrate the thinkableness of conventional dogmatic phrasing in light of new scientific insights instead. In trying to maintain the language of old, these papers certainly appeal to conservative Christianity but miss the chance to spell out in a new way what faith in the presence of the living God might mean against the backdrop of findings by quantum physics, systems theory, and the like. That is regrettable. Hopefully, the next series of like conferences—on (natural) theodicy and on eschatology—that are already in the making (422) will pay due attention to this lacuna.

On a last note, while the book is well prepared overall—as to be expected from anything by this publisher—there are some chapters in which a number of completely unnecessary printing errors occur (notably Chapters 7 and 8) that are disturbing and distract the attentive reader. Details matter, especially when dealing with topics that demand outmost precision not just in measurement and intellectual comprehension but also in adequate communication.

CHRISTOFFER H. GRUNDMANN

John R. Eckrich

University Chair in Religion and the Healing Arts

Valparaiso University

Valparaiso, IN 46383

Christoffer.Grundmann@valpo.edu

Paleontology: A Brief History of Life. By Ian Tattersall. West Conshohocken, PA: Templeton Press, 2010. 228 pages. Softcover \$19.95.

Tattersall richly sketches the dramatic history of life from its first tentative microscopic origins to our present situation. We see complex processes and rather frail participants playing on the stage of shifting continents and changing climates. The author, a curator in the Division of Anthropology at the American Museum of Natural History, makes the reader part of the action by opening doors on conflicting interpretations, profound questions, and coherent speculative explanations. *Paleontology: A Brief History of Life* ranks with the best sort of science writing for an interested public audience. Tattersall will induce many to go on a dig or join those careful hands that work fossils out of stony matrix, and, I imagine, he will incite some young readers to join him in the professional study of paleontology.

Tattersall's writing always draws the reader onward. Here is a passage about the end of the Pre-Cambrian era, around 650 million years ago: "[F]ew Ediacaran

organisms made it into the Phanerozoic Era, the age of 'revealed life.' In the first major extinction on record, they were replaced by the earliest members of the 'Cambrian Explosion,' who played the ecological and evolutionary games by entirely different rules" (p. 52). You simply must find out what the new rules are and how they differ from the old.

In his Introduction, Tattersall explains that "Science is a process rather than a product; and as it slowly inches in toward an ever-more-accurate description of nature, it is complementary to, rather than in conflict with, the many other ways of human knowing" (p. 6). It is with this lovely style and tone that he moves through the whole history of life. And, for me, Tattersall implicitly suggests that most human endeavors should be thought of as processes and approximations, rarely finished products, done-and-done; for even fossils deserve reinterpretation from time to time.

The nature of fossils and evolutionary processes occupy the first two chapters; the species concept and classification are explained in the third chapter; and the sparse fossils of the first three billion years of life are exposed in the fourth chapter. Chapters 5–8 buzz us through a dazzling parade of life concluding with whales and primates. Tattersall kindly reminds us with appropriate frequency that, for paleontologists, rapid change is measured in terms of millions of years or, at the very least, tens of thousands. Chapters 9 and 10 are titled "Walkers and Toolmakers" and "A Cognitive Revolution." Perhaps if the book were not aiming to discuss spirituality, the concluding chapters might concentrate on insects and bacteria, the most successful of creatures. There is a very useful chapter-by-chapter bibliography that gives a brief introduction into further reading, as well as an index.

The ambivalences and conundra of the fossil record obviously delight Tattersall. For instance, in discussing pelycosaurs, he notes that this group had the "multiple tooth types typical of mammals. As a result of this pattern of resemblance, most paleontologists today classify pelycosaurs together with the mammals, although probably no known pelycosaur was ancestral to any later mammal" (p. 73). Here, as throughout, Tattersall is able to sum up—in a few words—numerous digs, intricate cleaning of specimens, painstaking descriptions, discriminating reconstructions, analyses of alternative interpretations, preparation of refereed papers, and inevitable (sometimes bitter) controversy. Delightful detail finds a place wherever apt: "As a result of a revelation that allegedly came to him as he was carving his Christmas turkey, Huxley [a contemporary and strong defender of Darwin] had concluded by the early 1870s that birds and dinosaurs were not only related, but that birds had evolved from dinosaurs" (p. 86).

In Tattersall's account of primates, he goes further than most writers in acknowledging the intelligence and cognitive abilities of the great apes. Nevertheless, he is at pains to distinguish human intelligence as qualitatively different. Because of his commitment to symbolic thought inherently attached to language, he cannot, apparently, credit complex symbolic or linguistic capacities to the chimpanzees, bonobos, gorillas, and parrots who have clearly learned to use symbols to communicate with trainers and then used the symbols in novel ways to communicate about events or objects unknown, but now understandable, to their caregivers. For views more expansive than Tattersall's, the reader might explore writings by Sue Savage-Rumbaugh.

Our ability to think symbolically was an innovation that appeared, Tattersall reasons, in Africa. *Homo sapiens* had been around for some two hundred thousand years as a recognizable anatomical entity—“having clearly arisen initially in an entirely nonlinguistic context” but having a “symbol-ready brain” and the vocal apparatus to produce articulated language. He believes that between sixty and eighty thousand years ago, the population of *H. sapiens* had dwindled, perhaps to a few hundred individuals, because of dire climatic conditions (this would have been at the depths of the climatic effects related to the last glaciation). It was at this nadir, he reasons, that symbolic-linguistic traits first became fixed in a small group. As the climate improved, the newly arrived at culture spread rapidly through the surviving members of *H. sapiens*. Their offspring spread across the globe, eventually displacing all earlier species of the genus *Homo*. These were the Cro-Magnon people who entered Europe and Asia less than 40,000 years ago, people very much like us, with a culture now capable of creating extraordinary decorated tools and cave paintings “that can only have sprung from the unfathomable intricacies of the human spirit” (p. 191–96). Tattersall paints a coherent and intriguing picture of the rise of our genus and its only extant species, but this is one of several reasonable alternatives still very much a matter of research and discussion. From such symbolic-linguistic minds come spirituality and religion according to Tattersall’s carefully developed and persuasive theorizing.

Even with our symbolic-linguistic skills, no act or scene in our contemporary drama is without its perils. Tattersall seems to follow Lynn White in his condemnation of Judaeo-Christian traditions of “dominion” over nature as responsible for destroying the habitability of the ecosphere for many species including our own. It will be interesting to learn how Tattersall responds to recent scholarship that translates the Hebrew word in question as “care for” in a new version of the Old Testament, soon to appear from the Eerdmanns publishing house. Tattersall notes that our species appears to have a fundamental longing “for simple cause-and-effect chains” (p. 202). However, Stephen Gaukroger shows that this modern habit of mind arose as the *result* of the historical unfolding of the scientific enterprise and is not a locked-in product of our biological evolution (Gaukroger, S. 2006. *The Emergence of a Scientific Culture: Science and the Shaping of Modernity 1210–1685*. Oxford. ix + 563 pp).

Tattersall’s description of life and spirituality is delightfully readable and discussible. His book is neither dismissive nor dogmatic. It will be useful to audiences even beyond those envisioned by the editors of the Templeton Science and Religion Series. I hope that this slim volume goes into further printings and would urge the desirability of a few more pictures and charts, if possible.

PAUL G. HELTNE
 Director, The Ethopoiesis Project
 President Emeritus of the Chicago Academy of Sciences
 4001 N. Ravenswood, #401
 Chicago, IL 60613
 heltne@chias.org