

species humans are more similar to: chimpanzees or bonobos? However, de Waal argues that attempting to categorize ourselves in this way is fruitless, as we humans are much too bipolar: we cooperate and we compete, we are characterized by hate and by love. Further, de Waal argues that if we are “essentially apes, or at least descended from apes, we are born with a gamut of tendencies from the basest to the noblest. ... our morality is a product of the same selection process that shaped our competitive and aggressive side” (p 237). In other words, when attempting to discover from where our humanity evolved, we must look towards both our closest living relatives: chimpanzees *and* bonobos; and that both these species represent our two “inner apes.”

De Waal’s exploration of our “inner ape” is largely readable and often engaging, and even a reader with only a general interest in primatology would have no trouble understanding the arguments that de Waal presents. However, advanced primatologists and students might find the subject matter rather basic, as there is not much new research discussed in the book. In addition, the reliance on vivid, often emotional examples may put off some veteran primatologists who would prefer a more straightforward or dry approach. Yet it is clear that de Waal was not trying to create a data-heavy textbook on human and ape cultures. Rather, de Waal’s argument that humans exhibit important qualities of both chimpanzees and bonobos is well-developed, organized, and is complemented by excellent examples from his years in close contact with these animals. As a result, the reader is left with a solid understanding of what it means to be human, as well as what it means to be an ape; something that would be appealing to anyone with a general interest in anthropology and psychology.

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## JUST A THEORY: EXPLORING THE NATURE OF SCIENCE

by Moti Ben-Ari  
Amherst (NY): Prometheus Books,  
2005. 237 pages

**Reviewed by  
Michael Zimmerman**

The most common criticism anyone involved in the evolution/creationism controversy is likely to hear is that evolution is just a theory, and thus there’s no reason to privilege it over other ideas. Although Ben-Ari does not focus exclusively on evolution, he does pay it significant attention as he attempts to explain what it means for a scientific idea to rise to the level of theory.

He does a nice job, for example, of comparing the theory of gravity to the theory of evolution, pointing out that while there is no public controversy over the former, a great deal more is actually known about the latter. Sophisticated evolutionary mechanisms abound with a great deal of research being produced each year designed to determine the conditions under which each operates. A mechanism for gravity, on the other hand, is still purely conjectural with no solid evidence that gravitons — gravitational waves, and particles hypothesized to be “analogous to the electromagnetic waves and photons that come from electromagnetic fields” — actually exist. In the light, somewhat humorous style that permeates the book, Ben-Ari concludes, “Currently, the evidence [for gravitons] is controversial, so we must live with the embarrassment of risking our lives on a theory whose mechanism is not fully understood” (p 32).

Ben-Ari makes his comparative point very clear: “the theory of evolution more than fulfills all of

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the requirements of scientific ‘theoryhood,’ even more than the theory of gravitation. To brand evolution as ‘just a theory’ is the finest compliment one can confer on it!” (p 38).

The only reasonable conclusion to be drawn from this discrepancy is that those who attack evolution for being just a theory are clearly not doing so on scientific grounds. If the theory of gravity could be interpreted by some to have political ramifications, it too would be attacked by those who disagreed with those political extensions. What’s important to remember, though, is that the misuse of scientific concepts, purposefully or ignorantly, when those concepts are brought into the public arena should have no bearing on their underlying scientific validity. Ben-Ari appropriately explains that science is a discipline that strictly imposes self-limitations. “Few people appreciate that modern science is quite limited in scope and restricts itself to description and explanation of natural phenomena; on purpose, science does not deal with *purpose*” (p x).

Ben-Ari deals with the basics of the epistemology of science, how we know what we know, in a straightforward and readable fashion that is fully accessible to the general reader. He covers the importance of falsification, makes critical distinctions between the technical use of terms and the common use of the same words, provides a cursory overview of the use of statistics in science (focusing mostly on medical examples), and offers abbreviated critiques of the sociology of science and post-modern attacks on science. Taken together, all of this allows Ben-Ari to accomplish his main goal of helping readers “distinguish claims that are provisional and debatable, from claims that are so well established that rejecting them drives one over the border that divides real science from *pseudoscience*, which are activities that illegitimately wrap themselves in the mantle of science” (p ix).

The more sophisticated reader, one who is already fairly well immersed in the evolution/creationism controversy, is not likely to find much new in the book.

Similarly, this is not the book for those looking for specific refutations of creationist assertions about their “discipline” or for ammunition to rebut creationist attacks on evolution beyond those of the “it’s just a theory” genre.

Ben-Ari ends each chapter with a very short vignette of a famous scientist. These interesting but fairly superficial asides are designed to humanize the face of science and to demonstrate that science is always conducted within a cultural and historical context. The twelve people discussed include such notables as Newton, Darwin, Einstein, Pasteur and Pauling, but, unfortunately only one woman, mathematician Emmy Noether, is included.

By covering topics as varied as the nature of reductionism, geology, and the future of science, in addition to the epistemological approaches mentioned above, in such a short book it is not surprising that Ben-Ari is barely able to scratch the surface of any one of them. He has provided the equivalent of a tasty appetizer, one that might be the precursor to an elegant meal. Many readers will likely finish the book ready for the next, more substantial, course — and that’s not a bad thing!

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## INTELLIGENT DESIGN AND FUNDAMENTALIST OPPOSITION TO EVOLUTION

by Angus M Gunn  
Jefferson (NC): McFarland and  
Company, 2006. 215 pages

Reviewed by Charles A Israel

Other than the tantalizing clue of a dedication “To my fellow evangelicals,” Angus Gunn offers little sense of the purpose or intended audience for this short, polemical work. Whether these referenced evangelists are spreading the good news of the Christian gospels or the modern evolutionary synthesis

is not clear, though his book seems to lament the drift of ever more American Christians into anti-evolutionist camps. Evangelical Christian fundamentalists and non-fundamentalists might agree on very little, he asserts, but they “find common ground in their opposition to the theory of evolution” (p 53). How they came to this state, and why that poses a problem for modern America, is the focus of the book.

The major theme of Gunn’s work is “the importance of modern science and the tragedy of fundamentalist rejection of it for such a long time” (p 2). Gunn attacks one side of this problem in the final chapter, offering a few case studies of how biological research has been important in improving “human welfare”. Concentrating on recent advances in genetics and their positive impact on medicine, Gunn also appends a listing of “medical breakthroughs over 100 years” at the end of his book (p 189–90). The role of biological research in these advances is not entirely clear, and it seems that Gunn could have strengthened his case for the plausibility of evolution by examining how human pathogens actually evolve and not just stating that science is finding ways to combat disease.

Perhaps too easily blurring distinctions among “creationists, ... proponents of intelligent design, [and] fundamentalists” (p 3), Gunn nonetheless offers some helpful insights into what unites anti-evolutionists. In less temperate moments he damns them all as “just defending the past” (p 1), but at his best Gunn demonstrates the binding thread of a “common sense” approach to science, theology, and even political philosophy that lies at the heart of an evangelical rejection of evolutionary biology. The problem with such a belief, he notes incisively, is that these claims to inductive study of science or scripture mask the reality that the reader or Baconian scientist are still

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engaged in a process of interpretation. Theological fundamentalists seek to privilege their readings as the most authentic, but their conclusions are no less bound up with their own times and concerns than are those of theological modernists or evolutionary biologists. Gunn seems unwilling to pursue these insights about interpretation into science, boldly claiming, “science is and always has been free from issues of ethics and morality” (p 4), despite the growing literature in the social history of science since Thomas Kuhn’s path-breaking *The Structure of Scientific Revolutions* (1970).

Too often Gunn falls into an approach he criticizes when used by anti-evolutionists; like several chapters in *The Fundamentals*, the early-twentieth-century handbook of theologically conservative Christian thought, Gunn’s book frequently proves more “vitriolic rather than critical” (p 93). He describes evolutionary opponents as practitioners of a “mindless fundamentalism” (p 22) who refuse “to deal rationally” (p 39) with modern science. He even turns on its head the oft-used anti-evolutionist attack linking belief in evolution with the Prussian militarism of World War I or the Nazi atrocities of World War II. Gunn explains the success of George McCready Price’s flood geology with an explicit connection to Adolf Hitler, suggesting that both perpetrated “a big lie” (p 160) with disastrous consequences. I am not suggesting a purity of motive for anti-evolutionists — among other sources, evidence from the 2005 Dover trial demonstrated a clear pattern of deception on the part of several proponents of “intelligent design” — but to equate opponents of naturalistic evolution with a mass murderer of historic proportions is sure to produce more heat than light.

Beyond the excess of vitriol, Gunn’s volume suffers from insufficient background in the admittedly voluminous secondary literature. He asserts that Dayton, site of the 1925 Scopes trial, “was as fundamentalist as any place in America” (p 106), although as Edward Larson has demonstrated, the town was mostly Methodist and had a higher percentage of