

Reviews

Defenders of the Truth: The Sociobiology Debate. By Ullica Segerstråle. Oxford: Oxford Univ. Press, 2000. 500 pages. \$30.00 (\$11.17 paper).

The Triumph of Sociobiology. By John Alcock. Oxford: Oxford Univ. Press, 2001. 262 pages. \$34.00 (\$11.17 paper).

While I was a graduate student in microbial ecology in the late 1970s, Richard Dawkins's popularized version of E. O. Wilson's *Sociobiology (The Selfish Gene)* became required reading. In my written exams, I stated that the "selfish gene" and "genes for" phrases were good metaphorical heuristics but overly simplistic; genes code only for proteins, not for complex behaviors. The expressions of proteins at higher levels of organization (cells, organs, organisms, and so on) were too complex to comprehend so simplistically, even though, foundationally, it really was DNA's information (genes) that was critical. Today, we might claim that each level is supervenient on the next. Nevertheless, the selfish-gene metaphor was a good explanation card to play in the game of science. It would probably yield lots of good ideas. When it became a political brouhaha, I was surprised.

Here are two books that detail how the sociobiology game progressed between scientists with differing philosophies of how to play science. The first analyzes all the moves made; the second declares a winner and what it means to the future of science. *Zygon* has long been interested in the impact of biology on society, culture, ethics, and religion. Its interest in sociobiology's impact was cogently described by Michael Cavanaugh in his article "A Retrospective on Sociobiology" in the December 2000 issue (*Zygon* 35:813–26). On average, over the past thirty years, there has been at least one article per year in *Zygon* that either had sociobiology in the title or discussed its ideas. From that perspective, these two nontechnical and highly readable books should be in the *Zygon* scholar's library.

Segerstråle, a sociologist with a chemistry undergraduate education and professor of sociology at Illinois Institute of Technology, studies science as it should be: in a balanced and detailed way but with an understanding that science is a process to discover truths about nature. Her conclusions are really hypotheses for which she provides data and interpretation, and yet she admits that other interpretations are possible. What a refreshing respite from the typical constructivist views, rich in rhetoric but shallow in substance. She recognizes the peccadilloes of individual scientists who make questionable assertions (on both sides of the debate), but she does not let that detract from the ability of science as a collective to resolve truths about nature.

Segerstråle divides her book into three main parts, the first an encyclopedic history of the “debate” between advocates of sociobiology (Wilson, Robert Trivers, Dawkins, Bernard Davis) and its critics (Richard Lewontin, Stephen Gould, Richard Lewin). She details the sophistry (the Nabi incident) and sophomoric behavior (the dousing of Wilson with water) of the critics with accuracy and aplomb. In the second part she analyzes motives, political leanings, and approaches to science by all of the participants to explain both sides’ behaviors. In the last part she sets the discussion within the larger perspective of the cultural “science wars” that took place mainly in the 1980s and early 1990s; she believes that the sociobiology debate was a key catalyst for the constructivist views of science culminating (being demolished?) with the Sokal hoax.

Throughout her book she is fair-minded and balanced, offering only a partial win for Wilson’s sociobiological science—excluding his extravagant consilience claims. She points out that sociobiologists see competition between genes and their vehicles as the best model for explaining social behavior, while their critics see groups as more important. She explains that many of the antisociobiological views have their origins in Marxist philosophy. However, there also are epistemological differences between the two camps regarding what science should do. In her meatiest chapters, 17–19, she focuses on the constructivist view of science, how the debate fits within an Enlightenment view of science, and the tensions between scientific and moral truth.

The big differences between the camps were in how they sought truth in science. The sociobiologists were willing to float sometimes extravagant ideas in the science journals and books; their critics wanted theories thoroughly backed with data first. The sociobiologists were more willing to play idea cards and see what additional ideas would be played in the game of explaining natural phenomena. Their critics wanted to get all of the right trump cards before they played—and they did have some good ideas, such as that nonadaptive processes and multilevel selection also could be factors in the evolution of life. They just went about playing them the wrong way: using ideology in the popular press rather than confronting hyperadaptationism first in the science journals. However, Wilson also cheated a bit with his own agenda of trying to evolutionize all human behaviors (except rationality and science!) in a quest for utopia via scientific humanism. In the end, both sides were guilty of trying to use science to support their own peculiar brand of politics and ethics.

A major criticism of Segerstråle is that she has not distinguished between human sociobiology (or evolutionary psychology) and behavioral ecology in general. To understand this distinction, we turn to Alcock’s text. Alcock, Regents’ Professor of Biology at Arizona State University and author of the leading animal-behavior text in the field, shows us how the collective work of science moves toward a consensus that eventually shows coherence to uncover valid views of nature, including human nature. He does this by correcting some misconceptions of sociobiology, showing that it is really more about animal social behavior than human behavior. Of course, as anyone who actually has read Wilson’s *Sociobiology* knows, it is only the last chapter, which uses sociobiological explanations of human behavior, that has been criticized. It is one thing to describe pupfish sexual exploits as conditional strategies by sneaks, satellites, and dominant males to maximize reproductive success. Extend this kind of thinking to human behav-

iors, and people get offended (see, for example, the vitriolic criticism of Thornhill's treatment of rape by Jerry Coyne, *The New Republic* 222 (14): 27–34). Evolutionary Calvinism dependent on genes is anathema to the sociopolitical left. We crave the ideal of free will, self-determinism, and *tabula rasa*. How else can we achieve egalitarian utopias? Alcock clarifies that we can admit to an evolutionarily derived human nature providing certain physiological behaviors with adaptive (evolutionary) consequences without genetic determinism. Since we are capable of analyzing our behavior as evolved, we are aware of our actions to the point of asking why we do them. Even saints realize that they have a human nature difficult to overcome (Romans 7:7–25). Pupfish do not have conferences to deal with such angst. Alcock shows us that sociobiology does not claim we are programmed by genes but that we have propensities for certain behaviors as a result of our genetic heritage; free will is still intact. More important, Alcock fully realizes the fallacy of the naturalistic fallacy.

Alcock focuses his work on how successful sociobiology (or behavioral ecology) has been in describing animal social behavior and the testing of proximate and evolutionary hypotheses. He clarifies the phrase “genes for” a behavior. He fairly criticizes cultural relativism and determinism and does not pit us in a fight to defend the false dichotomy of nature versus nurture. Finally, he speculates on how sociobiology can affect human culture. He even offers a program based in evolutionary thinking for rehabilitating sex offenders. Oddly enough, and without meaning to do so, Alcock demonstrates that sociobiology has revived original sin, except that its cause is not one person's fall from paradise and perfection but rather every person's evolutionary heritage of desiring to proliferate at the expense of others. We even have a scapegoat for that desire: selfish genes, which developed our concupiscence. Fortunately, we have that wonderful neocortex to help us rationally choose to deny this selfish heritage and achieve salvation, according to Alcock.

Fledgling sciences often make grandiose claims and, even once they catch on, still have visions of the future. Alcock notes that there really were considerable Panglossian tales early on; it was just so much fun to explain human social behavior using animal-behavior metaphors. And it generated lots of hypotheses that could be tested, and so many papers could be written! Besides, if you weren't a molecular biologist during the last twenty-eight years, about the only other exciting field in biology was sociobiology. For behavioral biology, it was a shot in the arm. Fortunately, we have tempered the enthusiasm for tale bearing with data and a more critical eye. According to Alcock, correcting errors was a result not of the criticisms but of the competition of scientists for better explanations. That sociobiological explanations work well for most social animals is quite solid. If triumph is defined as sheer volume of scientific publications in the area (thousands per year), entire journals devoted to sociobiology, and societies of sociobiologists established, Alcock has used the word correctly. But is it triumphant for explaining human social behavior? It could be, if those pesky creatures would just stop thinking about their actions. Sociobiologists (or evolutionary psychologists) do work with populations that almost achieve that ability: those in the 18–25-year-old category, who only rarely contemplate their actions before doing them. It is those older and wiser philosophers and theologians who keep reminding us

about supervenience, emergent properties, and ethics that keep muddling up the data set.

Alcock does not make the extravagant claims, as do Wilson and others such as Dawkins and Steven Pinker, that sociobiology will allow us to see religion is “nothing but” an adaptation. This nonsequitur would also apply to any human pursuit including science. Even rationality would be “nothing but” a survival mechanism put together by the stochastic serendipity of natural selection. With that understanding, the constructivists could be right but at that point the discussion slips into a paralyzing dialectic regarding what is real (or true). Consequently, the hard-core sociobiologists need to give up their claim that religion and ethics, once described evolutionarily, are airy nothings. Such claims are based in their own political motivation to re-engineer society based on evolution providing ethical guidance. However, the antisociobiologists also need to admit that we have an inherent human nature that is impossible to completely overcome using social or political activism. Such an admission does not prove that they have to give up their melioristic pipe dream of a Marxist utopia; that realization will come pragmatically.

Either way, while playing science we just need to avoid the sociopolitical claims and play idea cards. Never trump in the game of science! For most sociobiologists, the key was to play; for their critics, it was to win. The critics wanted to trump the game with *the* true explanation, when the sociobiologists just wanted to keep playing idea cards for potentially good explanations to emerge. It is more fun to keep the game going with clever ideas. Gentlemen and ladies never trump, because it ends the game. But then, the critics wouldn't even play a card. They just criticized the last played idea and claimed to be waiting for the perfect truth card to be dealt before they would play.

Stop waiting for the perfect hand, and just play a card. Everyone wins when you keep the game going.

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Sociobiology: The New Synthesis. 25th Anniversary Edition. By Edward O. Wilson. Cambridge: Harvard Univ. Press, 2000. xiii + 697 pages. \$87.00 (\$29.95 paper).

The re-release of the unabridged version of *Sociobiology: The New Synthesis* twenty-five years after its initial publication represents something of a milestone. Most obviously, it marks the continued success and relevance of what is perhaps one of the most controversial science textbooks of all time. More generally, it represents the continuing importance and influence of the field of sociobiology and its claims. Often pronounced dead and finished, sociobiology and its related disciplines continue to influence modern debates concerning evolution, biology, and human nature in profound and sometimes not so subtle ways. Twenty-five years later, E.

O. Wilson remains at the center of many of these debates, and the republication of this text signifies his continuing influence as well.

At the same time, the re-release signifies how much things have changed since its original publication in 1975, for the anniversary edition is not a revision of the original textbook. Indeed, the only alteration from the original is the addition of a foreword by the author, commenting on the book's reception and the development of sociobiology as a discipline in the years after the book's publication. While this is of some interest, giving Wilson's perspective on the controversies following the book's publication, it contains little that is new and has not been covered elsewhere. Rather, it would seem, the re-release provides us an opportunity to see the argument for sociobiology as it was made over a quarter of a century ago and ponder anew its claims and the controversies that surrounded it.

The aim of sociobiology, both the science and the textbook, is straightforward. "Sociobiology is defined as the systematic study of the biological basis of all social behavior" (p. 4). In terms of its time period, sociobiology set out to unify otherwise disparate areas of biological study and especially to correlate the study of animal behavior with the significant developments that had occurred in population biology and with the ongoing and rapid developments that were occurring in genetics. For Wilson, there is a self-conscious disciplinary imperialism present in the definition, for his hope, most explicit in the beginning of the text but appearing in places throughout, is that the development of sociobiology will sweep away a great deal of academic confusion and even entire disciplines as its explanatory power becomes greater and greater. Implicit, as well, is the inclusion of human beings as biological organisms and the disciplines devoted to studying human nature, such as sociology, psychology, and economics. This last claim, of course, has stirred the greatest controversy, even though Wilson devotes only a small fraction of the book to elaborating it.

Indeed, the strongest impression one gets in reading *Sociobiology* twenty-five years later is that it is a science textbook printed in 1975. Its 600-plus pages begin with a basic methodological overview of evolutionary and population biology concepts and then move to cataloguing the variety of forms of social behavior that occur throughout the animal world. The greatest portion of the text is therefore descriptive in character, and the degree to which Wilson attempts to provide theoretic (that is, evolutionary or genetic) accounts of social behaviors such as communication or dominance systems varies considerably. It is interesting to note the kind of science that was available to Wilson in 1975 and earlier when he was writing the text. Dian Fossey was still alive then, and Jane Goodall's work was just becoming well known. "Lucy," the famous Australopithecus skeleton, had only recently been unearthed. Indeed, one is impressed by how much important work has been done since *Sociobiology's* original publication, much of which Wilson would likely find supportive of his general thesis if not the particulars.

As Wilson notes in the foreword, a very small portion of the book is concerned with human beings and human nature, even though it was with regard to these claims that controversy erupted. Except for the occasional aside here and there, biology and human nature is not discussed until the very last chapter of the book. Wilson begins this chapter with some acknowledgment of the degree of speculation required ("Let us now consider man in the free spirit of natural history . . ." p. 547), although this thought is quickly lost as Wilson plunges into data and

theory. In contrast to many modern claims made on behalf of evolutionary psychology, Wilson's claims here seem relatively tame, observing the variability of human culture and cataloguing competing theories of language development. Three claims, however, stand out, revealing why the text became controversial.

First, Wilson's musings on religion and ethics here set the tone for much of sociobiology's later treatment of these subjects, including by Wilson himself. For Wilson, religions are demonstrably false and oppressive, and so the primary question for sociobiology is why religions exist at all. To this end, Wilson speculates that people subscribe to religion because of the existence of conformity genes. Advocating a group-selectionist model, groups of conformists will outcompete nonconformists. Presumably, religion is somehow the vehicle of this conformity, although how this could be is never explained.

Second, while religion will be explained away by sociobiology, ethics will be enhanced. Freed from its tie to religion, Wilson sees sociobiology providing the groundwork for a "genetically accurate" ethical code. Wilson does not explain what such a thing would be, although it apparently has little to do with John Rawls's concept of "justice as fairness," a notion Wilson dismisses as suitable only for (nonexistent) disembodied spirits. Modern moral philosophy appears to be one of the disciplines that Wilson seeks to eliminate, espousing a kind of scientism triumphantism that will emerge much more clearly in later works.

Finally, Wilson does engage in some analysis that is not terribly far removed from the kinds of claims for which social Darwinism and the eugenics movement became notorious a century earlier. Wilson considers seriously (but ultimately rejects) social Darwinist claims that the rich and successful are more fit and smarter than the poor (it is interesting to note that one of the sources Wilson cites here is Richard Herrnstein, who later achieved notoriety as coauthor of *The Bell Curve*). More significantly, Wilson concludes the book with a warning about the potential dilution of genes for altruism because of the impersonal character of modern society, a claim with inflammatory political consequences if there ever was one.

It is important to emphasize that these points occur almost exclusively in the final chapter of the book, although because of their position and topic they have a greater weight than other material. They also sync with one final feature of *Sociobiology* as a text, which is the use of occasionally provocative and inflammatory language to explain and explore the character and content of the discipline. This is most noteworthy at the beginning of the text, which is prefaced with a quote from the Bhagavad Gita (the suitability of which is never fully clear), and then moves on to the first chapter, titled "The Morality of the Gene." Albert Camus's existentialist reflections on suicide are simplistically said to be refuted by a biological examination of the hypothalamus and limbic system of the brain (p. 3), while the story of the good Samaritan is retold and reinterpreted so as to show that the Samaritan really was acting selfishly all along (p. 120).

The inclusion of such red herrings is unfortunate, for they give an ideological flavor to the text that is unnecessary and go beyond anything that the science itself could show. They also show why sociobiology has not simply been a scientific discipline like others but also is a movement with ideological overtones. This also is unfortunate, for *Sociobiology* as a textbook did raise important issues and has helped to fuel an entire generation of research. Yet, its imperialistic claims eventually fell short. *Sociobiology* has not eliminated or reduced other disciplines.

Indeed, *Sociobiology* was published merely a year earlier than Donald Griffin's *The Question of Animal Awareness* (1976), which launched the modern field of cognitive ethology. Rather than a reduction of the number of scientific disciplines, we have more. While sociobiology has made important contributions to our understanding of the biological world, the attempt at disciplinary reduction and synthesis turns out to have been premature in 1975. It seems to be still premature today.

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Reenchantment without Supernaturalism: A Process Philosophy of Religion.

By David Ray Griffin. Ithaca, N.Y.: Cornell Univ. Press, 2001. ix + 426 pages. \$24.95 (paper).

David Griffin, professor at the Claremont School of Theology, has developed here an expansive philosophy of religion along the lines of process thought. Adhering faithfully to Alfred North Whitehead's works for the most part, Griffin is not reluctant to sharpen, correct, or modify the great philosopher's ideas at times, especially as they pertain to the understanding of God. Griffin's book is essential reading not only for those interested in the philosophy of religion but also for anyone concerned, as Whitehead was, about the future relationship of science and religion. Moreover, this outstanding work will be of value more generally to those interested in how well process thought stands up in an encounter with contemporary philosophical critiques of religion. It also serves as a splendid introduction to process thought.

The book is built around ten major tenets of process thought that make Whitehead's philosophy the ideal framework for understanding nature, God, religion, reason, science, morality, and common sense. Most of the ten core doctrines on Griffin's list are of consequence for understanding the relationship of science to religion, but several are especially significant:

1. Moral, aesthetic, and religious intuitions must be integrated along with science into a self-consistent worldview. This maxim makes Whiteheadian thought especially worth looking into as a wide framework for bringing out the consonance of theology and science while articulating their essential differences. Unlike most recent philosophers, Whitehead took religion seriously, not simply as a source of meaning and comfort but even more as a way of experiencing that reaches deeper (though more vaguely) into the world than do the more abstract representations of science.

2. The ultimate test of the adequacy of any philosophical proposition is its consistency with hard-core common sense. For example, philosophers should not deny explicitly what they always affirm implicitly, such as the human mind's capacity to arrive (more or less approximately) at a realistic understanding of the world. Certainly science cannot get along without implicitly trusting in the mind's ability to reach truth; yet many contemporary philosophers explicitly doubt that

it can. Whitehead's thought is important for disallowing such duplicity. In a relativistic intellectual climate it should be especially attractive to those who defend some version of scientific as well as religious realism.

3. Human experience of the world is not reducible to sensory perception. Our primary and deepest (though also blurred and indistinct) encounter with the world occurs in the mode of causal efficacy. Sense perception actually is secondary to and abstracted from a more fundamental experience (prehension) of the world. Thus we may have a direct—though obscure—intuition of divine reality, moral norms, and the causal influence of the past without having to reduce such deeper and more fundamental experience to what can be grasped in terms of the clearer, but narrower, pole of sense perception. Whitehead's nuanced theory of perception makes room here for the cognitive competency of symbolic religious expression, and it grounds his claim that the clear and distinct ideas of modern scientific materialism, ideas mistaken for rock-bottom reality by many modern scientific thinkers and philosophers, are really quite abstract. The role of the philosopher is to criticize these abstractions for leaving out most of the real world's depth.

4. Process thought is *panexperientialist*, a term that Griffin considers more fitting than the traditional label *panpsychist*. Panexperientialism maintains that every actual entity is a unit of experience, however faint this experience may be. If we fail to adopt panexperientialism, we end up inevitably dividing the world dualistically into things that have experience and things that do not. Such a strict dualism has exercised enormous mischief in the course of human history. In modern times it has led to the metaphysics of materialism, a vision of the world that considers everything outside of the human mind to be essentially mindless—utterly devoid of subjective experience. It has finally sought to reduce mind itself to mindless constituents. Once the natural world came to be thought of as essentially mindless, it was not hard to envisage it also as essentially valueless and meaningless. And because so many issues in science and religion come down to the question of whether science has not perhaps made the universe seem more and more senseless, it is essential to examine critically once again the underlying dualism out of which this suspicion has emerged. Is not panexperientialism, Griffin asks, the only reasonable alternative to an arbitrary dualism on the one hand and a nihilistic materialism on the other?

5. Process thought's understanding of God can best be expressed, Griffin maintains, in terms of *naturalistic theism*. Carrying further a theme proposed in his earlier book *Religion and Scientific Naturalism*, Griffin argues here that the most consistent way to make the idea of God intelligible in terms of contemporary science and philosophy is to replace classical supernaturalist theism with a more "naturalistic" sense of the divine. He is aware, of course, that "naturalism" usually means the belief that "nature is all there is," and therefore "naturalistic theism" may sound almost as oxymoronic as "atheistic theism." Nonetheless, he is convinced that the theistic philosopher of religion today must go along with some aspects of naturalism, particularly its rebellion against the notion of a supernatural, interventionist God. Supernaturalist theism, after all, now strikes many scientists and philosophers as too open to the possibility that God can make arbitrary interruptions at any time or place in the natural continuum. Such interventionist divine activity does not make sense in a scientifically shaped intellectual climate.

Whitehead's philosophy offers an alternative to supernaturalism that can do justice to both scientific and religious experience.

Griffin is by no means claiming that nature is God, or that God is not in some sense distinct from nature, or that God is not personal, creative, and redemptive. But he is firmly convinced that the philosopher of religion cannot make a plausible defense of theism without embracing the idea that "the fundamental God-World relation is fully natural, grounded in the very nature of things, not in a contingent divine decision" (p. 6). In spite of Griffin's staunchly theistic intentions here, some readers will undoubtedly wonder if the force of linguistic constraints and the momentum of traditional usage of words will not cause the expression *naturalistic theism* to obscure the religious experience of God's otherness and freedom in relation to the world. Griffin, however, carefully qualifies the term *naturalism* with appropriate subscripts as he moves back and forth between the theistic and atheistic contexts.

However, the predominant recent usage in philosophy and theology of the term *naturalism* has been to signify a Godless view of the universe. For example, when philosopher Owen Flanagan states in his recent book *The Problem of the Soul* that the mission of contemporary philosophy is to make the world safe for naturalism, he clearly means for atheism. And in the popular religious writings of C. S. Lewis and others naturalism is the archenemy of every religious interpretation of the world. Additionally, even when they agree substantively with Griffin's theism, most theologians will probably feel uncomfortable associating their thought with naturalism, however carefully the term is qualified philosophically.

Even more problematic, however, is that Griffin persistently employs the word *naturalism* only in its atheistic sense when speaking of Darwinism. He is convinced, for example, that Darwin's gradualist interpretation of evolution "followed from his commitment to [materialist] naturalism, not from his examination of the fossil record of the evolutionary process" (p. 206). He takes issue with "the gradualism of Darwinism and its atheism" and complains of how "the nominalism of Darwinism followed . . . from its atheism" (p. 211). He espouses substantively Michael Denton's and Michael Behe's controversial critiques of Darwin, agreeing in effect with the notoriously anti-Darwinian Phillip Johnson that Darwinian biology is irremediably atheistic.

Griffin, of course, does not want to reject what he considers to be empirically grounded evolutionary biology, but his unqualified association of Darwinism with atheism raises some troubling questions. For example, from the point of view of the contemporary dialogue of theology with evolutionary scientists, how fruitful will it be to tell Darwinians that they must abandon gradualism if they expect to come to grips with a coherent theism? In effect, has not Griffin made the plausibility of his theism dependent on science's discovering leaps or jumps in evolution, saltations that most evolutionists, following Darwin's lead, do not accept? And because of his alliance with Denton and Behe how does Griffin protect his own naturalistic theism from at least giving the ironic appearance of reverting to the supernaturalist, interventionist theism characteristic of the Intelligent-Design anti-Darwinians? Deeper yet, cannot evolution be physically, chemically, genetically, and historically gradualist without having to be interpreted materialistically in the way that many Darwinians and their opponents generally do?

Griffin will undoubtedly address these matters more attentively in the future. The concerns mentioned here do not take anything away from this reader's overall impression that *Reenchantment* is a most important addition to Griffin's already impressive body of work.

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Reductionism: Analysis and the Fullness of Reality. By Richard H. Jones. Lewisburg, Pa.: Bucknell Univ. Press, 2000. 409 pages. \$60.00.

This book is a surprisingly comprehensive analysis of the myriad efforts to explain a "higher" event in terms of something "lower." The spectrum of reductions, attempted and contested, is a broad one. Hardly an area of the arts and sciences is untouched, and in that sense reading this book is an exercise in liberal education. Jones's ultimate interest is religion; the last third of the book is devoted to it. But Jones builds toward this end, starting with reductionism "lower down"—whether, first, reduction works even within physics, then whether biology can be reduced to physics; then on to the social sciences, whether psychology can be reduced to physiology, sociology to psychology.

The sweep of the book argues that reduction (if distinguished from interlevel connections) is not working well anywhere, and, if not lower down, there is even less reason to suppose that it will work higher up. Is there anything superphysical, anything superbiological, anything superpsychological, anything supersociological, and, in the end, more generically, anything supernatural, super to the natural?

Hundreds of reductionists have been at work, especially in the sciences. But doubts not only persist; they grow. "During an era that outside of philosophy is an 'Age of Reductionism,' the majority of philosophers who have actually explored the issue have become antireductionists of one stripe or another" (p. 67). This partly reflects the popularity of pluralism; scholars do not favor unified accounts or grand narratives, including grand simplifications. Reductionism seems too close to foundationalism. No unified account of reality seems possible, and such an account probably is not desirable either. "Modern science is a patchwork, not a unified system" (p. 124). The current advice is: Enjoy the multiple accounts, and don't get too worked up about reducing them one to another, bottoming out in subatomic physics.

As Jones moves across the spectrum, there are good discussions of some puzzle pieces—for example, of the ambiguities in the popular term *supervenience*, showing how, often, "reductionists use the same term as the antireductionists but mean something very different" (p. 65). There is a useful analysis deflating the sought-after Theory of Everything as essentially a misnomer (pp. 164–69). There are teasers: "Some branches of science, such as evolutionary biology, have proven especially resistant to the reductive approach" (p. 151). One wishes that Jones had said more here, since evolutionary biology is the most troublesome science, seemingly the universal acid (claims Daniel Dennett) that dissolves all. But, looked

at from the reductionist perspective, this acid does not reduce everything it touches so easily. The problem is that there is too much emergence and perennially innovative history and rather little lawlike predictability.

Working through the natural sciences, as the best examples of epistemological reduction, Jones concludes: "Reductionists also now generally agree no single account of reduction can cover all the relations of theories in the sciences, but rather a variety of accounts is needed. And, more importantly, there may be instances where no reductions are possible at all" (pp. 150–51). In fact, the scientists, as scientists, do not seem to be able to settle the reductionist question(s). "The important point here is simply that science itself is a selective point of view—one way of approaching reality—and this in itself entails no implicit final metaphysical commitments. Reduction and antireductionism, on the other hand, are metaphysical in nature in the sense of going beyond science and providing views on the nature of scientific findings" (p. 117).

Meanwhile, most thinkers, reductionists and antireductionists alike, are naturalists of some stripe or other, and so Jones has a problem looming. Many naturalists are not reductionists; they do not think that biology can be reduced to physics or culture to nature. But still they are naturalists, and that does seem to make them substantive reductionists of a kind: they reduce any supernatural or transcendent to the natural. So that becomes the pivotal question.

The best example of attempted substantive reduction is the mind-body problem. Here Jones concludes,

But although both reductionism and antireductionism are logically viable options on the basic question of ontological reductionism, antireductive materialists present the stronger case today. . . . Consciousness and other mental phenomena are not the impotent appearances of some underlying reality but are irreducible realities themselves. They may be open to explanation, but they cannot be explained away. . . . Antireductionists do have something on their side: the obvious. . . . In short, it is more reasonable today to believe consciousness is part of the blueprint of the universe than to deny it. (pp. 110–12)

So, we may still be naturalists, but we have consciousness very much on our explanatory agenda; and, if consciousness, then "spirit" remains a possibility.

In the social sciences, religion is a pivotal test case. The first inquiry here is whether religious phenomena are *sui generis* or can be teased into various parts and reassigned to other disciplines. "Structural reductionists argue that actions ostensibly driven by religious reasons are really done for economic, psychological, or other reasons; only the nonreligious sociocultural bases are real, and they alone explain religious actions. The structural antireductionists' central tenet is that religious people really do act for religious reasons—whether or not the transcendent is in fact real—and not just for political or other reasons" (p. 237).

Religious studies, contrasted with theology, is a comparatively recent discipline. But there is a danger that, by its desired academic framework, it reduces religion to something less than full-bodied religion. Jones concludes that, for the most part, those engaged in religious studies are not very sophisticated about this. "The need for the clarification of terminology concerning reductionism is greater here than in any of the other areas covered in this book, since the disputants bandy the word about while spending little time on what the term means or on the fact that there are different types of reductionism" (p. 326).

There are five general problem areas with naturalistic reductions of religion: “(1) the need to defend one particular natural explanation as plausible today; (2) the broadness and looseness of natural explanations; (3) the lack at present of a complete and detailed explanation; (4) that all beliefs are equally open to such explanations; and (5) the compatibility of natural and religious explanations” (p. 279).

There is no single, commanding naturalistic explanation; there are in fact many, often incompatible with one other, often problematic, and none offers a convincing account. Many have been discredited, even by those who are not religious, as inadequate (Freud’s religion as wish fulfillment, or E. O. Wilson’s myth enhancing reproductive fitness). The explanations are quite plural and mostly promissory notes. “The naturalists’ position is far from readily convincing” (p. 294).

Reductionists may hold on rather tenaciously “in principle” to some forthcoming more complete account. But this in-principle belief, in view of the messy evidence, suggests that their orientation is driven by metaphysical commitments more than by any actual science (pp. 282–84). Many of the reductionist explanations of religious beliefs apply just as well, *mutatis mutandis*, to nonreligious beliefs. Science is as easily socially deconstructed as is religion; science like religion is a survival-enhancing technique; science too is in the service of wish fulfillment, or status, or power, or need for complete explanations. What’s sauce for the goose is sauce for the gander.

Does religion encounter a transcendent sacred? Naturalistic accounts, even so far as they should prove plausible (religion conveying survival benefits), still leave open the question whether, when the religious behavior has been explained as “natural,” explanations are over—or are perhaps also compatible with transcendent accounts (God gave us this religion that we might long survive in the land). Here is the brain chemistry that goes with the religious experience of the Hebrew prophets, but where is the proof that there is nothing more to it? Here is the brain chemistry that goes with relativity theory, also some more chemistry that goes with astrology, but we still have the truth questions to wonder about. There will be some brain chemistry to that wondering, too, but that does not dissolve the truth question.

Naturalists may argue that theirs is the default position, the simplest one, but default does not mean faultless; it often means not very advanced. Yes, naturalistic explanations are better than religious ones by scientific standards, but that just defaults to the scientific standard, which, everybody knows, is not very sophisticated at interpreting meanings in life, at judgments of good and evil, at the limit questions.

Reductionists claim that when the more is explained in terms of the less, this less is really more—a more unified and satisfying explanation. Antireductionists claim that what really needs explanation is a universe in which there is forever more out of less, configurations surprisingly reconfigured, more diversity and complexity later on than there were earlier, first in nature and then in culture. Jones’s sympathies clearly lie with antireductionism. “The conclusions to the above chapters can be easily summarized: antireductionism in its various forms today appears more convincing in the areas of mind and body, the natural sciences, the social sciences, . . . and religious studies. . . . Whether one rejects the substantive reductionism and accepts a transcendent religious reality underlying

the natural order or any other transcendent realities turns more clearly on broad metaphysical considerations rather than issues related to reductionism alone" (p. 333).

It does not follow from this that Jones holds that the religious antireductionists are the clear winners. They are running out front until we reach the home stretch, and then Jones is mostly insistent only that they are still running strong. "We are left with two alternative groups of metaphysical systems, neither of which is more compelling at present." And, alas, "this may remain our situation forever" (p. 297; cf. pp. 329–30). The race may never be over.

One could think this is bad news, but Jones frames it differently. The greatest mystery is this unknown future, in which novel emergence is possible, indeed expected. The creativity in the world, so far, resists reduction owing to continuing emergence, and that creativity is still with us. "Such emergence may be an intractable *mystery*—that is, not just a problem awaiting further scientific study, but something forever beyond our abilities to know in principle. It may be a basic, brute fact about reality that will remain impregnable" (p. 333–34). One is reminded of Robert Louis Stevenson: "It is true that we shall never reach the goal; it is even more than probable that there is no such place. . . . Little do ye know your own blessedness; for to travel hopefully is a better thing than to arrive" ("El Dorado," *Virginibus Puerisque* [Boston: Maynard & Co., 1907], 163).

The feature of the universe most likely to resist explanation is this mysterious creativity. The reductionist "attitude misses something fundamentally important. In their zeal to explain or replace the complex with the simple, reductionists are looking the *wrong way*. Reality has been getting more and more complex, but reductionists keep looking for the simpler and simpler. Complex levels are emerging, and reductionists are looking only for the lowest, most general levels. . . . This [creative] process is both extraordinary and yet recurring throughout the history of the universe" (p. 334). Some readers will make connections with theologies of the future, others with current theologies that feature God's hiddenness.

Maybe what we still need at the end is a discussion of Pascal's wager. One cannot wait forever, or even a decade, lingering on the edge, for these issues to be settled, before living one's life. Willy-nilly, unless we just drift, we will be oriented by religion or nonreligion, theism, monism, naturalism, humanism, or scientism, or something. Maybe there is more orientation than first appears to find ourselves in a universe with so much going on over our heads.

Readers who pick up this book will first discover that Jones, though impressively educated, is currently a lawyer; and they may worry whether such an outsider can competently address these issues. Readers who continue will be surprised and also reminded that one thing lawyers are often good at is assessing the strength of evidence on both sides of controverted events. Jones does that quite well. Perhaps he is an outsider to many of these disciplines (as are we all; there are too many); but he has felt the power of encounter with a mysterious universe.

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Paths from Science towards God: The End of All Our Exploring. By Arthur Peacocke. Oxford, England: Oneworld Publications, 2001. 198 pages. \$16.95.

Having previously reviewed Peacocke's exceptional but challenging *Theology in a Scientific Age* for *Zygon*, I can safely say with informed confidence that *Paths from Science towards God* is the better book. "Better" is a comparative, not a pejorative, term, the use of which requires immediate justification. There is nothing lacking in the earlier book. Indeed, within its 400 pages Peacocke mounts a sustained and detailed argument for his impressive vision of the relationship between science and theology. Those who have read *Theology for a Scientific Age* will find much of the territory in this book to be familiar. But *Paths* has the virtues of being half the length, sparing in scientific and theological jargon and detail, and succinct in its arguments. For these reasons alone it is a pleasure rather than a project to read. Moreover, the book moves beyond persuasive argument and astute observation to include a deeper dimension of wise reflection that can come only from one who has personally been involved in the explosive and dynamic growth of the field of science and religion for well over three decades.

Mature wisdom often is associated with a conservative philosophy that rejects change and is suspicious of the contributions that secular pursuits could allegedly make to theology. Peacocke's position cannot be included in this characterization. The book's title is a clear expression of the important role of science as a source for theological insight. Granted, any such position is subject to charges of reductionism wherein theology is legitimated primarily, if not exclusively, by the endorsement of science. Perhaps Peacocke, along with many other prominent sympathizers of the approach known as *consonance*, is guilty of reductionism as charged. But the offense is more of a misdemeanor than a felony. Peacocke recognizes the autonomy of each enterprise within its own domain and yet sees each as contributing to a greater truth that requires the other to be known fully.

There is good reason for advocating this approach. Theology needs all the help it can get in an age when many have abandoned their institutional religious roots in favor of alternative spiritual paths or no paths at all ("wistful agnostics," p. 12). Peacocke subscribes to the position, shared by many in the field of science and religion, that the crisis in traditional faith is substantially the result of a loss of credibility—"the loss of respect for the intellectual integrity of religious thinking in general and of Christian theology in particular" (p. 15). On the one hand, both science and theology must refuse the "poisoned chalice" (p. 21) of postmodern relativism with its reduction of all objective truth claims to socially constructed perceptions of specialized communities of discourse. Science works, and its labors are cumulative and progressive. On the other hand, theology must free itself from an outmoded absolutism concerning scripture, community, and truth. Theology "has to become an open exploration in which nothing is unrevisable" (p. 30).

This position is hardly conservative. Peacocke is confident that theology is capable of progressing, but only if it surrenders its static vision and replaces it with one that draws upon the advances of science. This new consonance is more than a matter of integrating fresh knowledge. It is also about method. Peacocke generalizes from the so-called scientific method to a position that includes both

science and processes of inquiry found in many sectors of life. This quest for reasonableness in science and ordinary life that can probably be traced to biological origins he calls “inference to the best explanation” (IBE). Simply put, “according to IBE we infer what would, if true, provide the best of the competing explanations of the data we can generate” (p. 27). The data for science are generated by experiment and observation, while for theology they come from “Classical Revelatory Experience” (CRT) (p. 33). Peacocke proposes that theology take into account not only this CRT but also the discoveries of science about the nature and character of the universe (S) to generate a “radically revised theology” (RT) appropriate to our times (p. 33). The formula S plus CRT yields RT may be expanded to include other religions (seen by Peacocke as legitimate responses to divine revelation, too) to generate a global theology. However, in this book he is satisfied to limit the task and work toward the construction of a radical theology intended for those whose faith is framed by the Judeo-Christian tradition.

All of this is in Part I, “The Spiritual Quest in the New World of Science.” In Part II, “Exploring from Science towards God: New Vistas, Challenges and Questions,” Peacocke describes “the world as it is” (p. 37) and “the world in process” (p. 65) as revealed by the natural sciences before examining the ways that God most likely interacts with such a world. From these accounts, Peacocke derives four fundamental premises, the pillars upon which his “radically revised theology” rests. The first is that the world is a system of systems, a “single, hierarchically stratified complex” (p. 48) in which information may flow from the whole through the parts or subsystems. That is, the system as a whole may influence its respective parts. While this is so, the total system has an integrity that is invulnerable to direct intervention from any external source. The cosmos or nature is to be understood in its own terms. Science is not required to appeal to transcendental entities in its inquiry into the order of this total system. Given this “presumption of naturalism” (p. 92), Peacocke is very clear in his rejection of the classical notion of miracle. The model of God as “a kind of semi-magical arbitrary Great Fixer or Occasional Meddler” (p. 57) is an incoherent concept for theism. Far from being an excessively transcendent Deus whose contact with the creation constitutes a violation of its integrity (the “externalist interpretation,” p. 142), the being of God “includes and penetrates all-that-is” (p. 117). This position, known as panentheism, obviates the need to discover a “causal joint” for divine contact with the world system. Indeed, the very notion of divine intervention vanishes in the panentheistic model since God is already present in the world. This second premise in Peacocke’s argument leads him to express strong reservations about chaotic systems and quantum events as places where the divine influences the world without violating its integrity.

Two additional premises complete this model of divine agency. The first is that God makes the world make itself. The process of evolution, full of chance and random events, gives rise to propensities (such as the tendency toward the appearance of intelligent creatures in the life-breeding cosmos) that are actualized and bring about the truly novel. This process of evolutionary emergence is how God acts through the world rather than upon it. In addition to this “theistic naturalism” (p. 135), Peacocke’s emphasis on the integrity of the multileveled world system leads him to suppose that God acts on the world system as a totality to influence clusters of particular events through a “trickle-down effect” that does

not abrogate the laws of the world system (p. 110). Once again, through this whole-part mediated influence, the world does the work of God in accordance with its inherent regularities, not despite them.

At this point Peacocke has made a strong argument that his panentheistic model satisfies the requirements of reasonableness in the IBE process of inquiry, and *Paths* could conclude. But in Part III, "The End of All Our Exploring," he carries his model explicitly into Christian doctrine and practice. His discussion of the sacraments is especially revealing. Peacocke detects a congruence between what science says about matter and the transvaluation of that matter by sacramental perspectives and practice. The stuff of the universe (the bread and wine of the Eucharist, the products of corn and grapes and constituted by complex chemicals) realizes new potentialities in the "holistic totality" of the liturgy (p. 152). The reader is reminded of similar thoughts expressed by Pierre Teilhard de Chardin in his mystical essay "The Mass on the World" (in *Hymn of the Universe* [New York: Harper, 1965]). Indeed, the spirit of *Paths* is very close to that of Teilhard, who understood his own investigation of evolution to be the contribution of science to the emergence of a novel and total vision of God, world, and humankind that in itself would qualify as the best explanation for the data—the account of the world given by continuing scientific advances. Peacocke's discussion of sacramental theology within the context of his broader system of theistic naturalism addresses the need in religion-and-science studies to move beyond theoretical debates about divine agency to apply the knowledge and wisdom of decades of constructive dialogue between the two enterprises for the sake of those whose spiritual lives are centered not in theoretical issues but in acts of worship. For these contributions and for all the others in this very readable book we can be joyfully appreciative.

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