What Happens to Religion When It Is Biologized?

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"Exact science and its practical movements are no checks on the greatest poet but always his encouragement and support."

Walt Whitman, *Leaves of Grass*

From a number of different quarters, a new paradigm of *homo religiosus* is emerging, one founded in a laboratory understanding of biology and the human mind. I call this project "biologizing," in reference to E. O. Wilson's notorious call for inquiry into human values "to be removed temporarily from the hands of philosophers and biologized" (1975: 562).[1] Most of us know *homo religiosus* best from the use to which Mircea Eliade put it ([1957] 1959), the "religious man" of archaic societies who lies half-dormant even among moderns. With its Latin reference to our Linneaean species name, the term treats religiosity as bound up in human nature. Problematic as such an assumption may be, it has driven people to look for the roots of religiosity beyond the supernatural wisdom claimed by particular traditions to the people themselves doing the claiming. Now, as human nature comes to seem describable as a biological fact, so also does human religiosity.

Driven by a growing confidence in cognitive science, neuroscience, evolutionary psychology, and genetics, truly biological pictures of religious activities and beliefs are appearing. Elements of religiosity, allegedly, can be described in terms of neurological mechanisms that arose during the course of human evolution. This idea has taken root in a world that was able to declare the 1990s "the decade of the brain"[2] and in which mental illnesses are treated more and more though psychiatric drugs rather than analysis or spiritual practice alone. ("Zoloft works better than God," a priest once told me.) Popular magazines, from *Newsweek* and *Time* to the *New York Times Magazine,* have paraded the research around with catchy labels like

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[1] Religion is not the only traditionally humanistic field that has been a target for biologization. E. O. Wilson's *Consilience: The Unity of Knowledge* (1998) calls for a convergence of biology with social science, art, and ethics as well as religion. Brian Boyd's volatile polemic in *The American Scholar* (2006) argues that the same needs to be done for cultural criticism.

[2] Proclaimed in the United States by President George H. W. Bush on July 17, 1990.

"the God spot," "the God gene," and "Darwin's God." People from a variety of religious perspectives, from Western Buddhists to evangelicals to the anti-religious, have practiced and discussed this body of research, each bringing to it their sometimes contradictory assumptions and interpretations. Biologizing religion is a research project, but it is also a public desire trying to satisfy itself, trying to breed consequence.

So what happens to religion when it is biologized? Many would intuitively believe philosopher and "New Atheist" Daniel Dennett, whose bestselling *Breaking the Spell* (2006) frames biologizing religiosity and overcoming it as two sides of the same coin; each leads to the other. Confident in the possibility of a biological account, Dennett contends that "we" should "gently, firmly educate the people of the world, so that they can make truly informed choices about their lives" (339), choices which (if the science is done right) he clearly believes will involve dispelling religion. Less optimistically but along similar lines, cognitive anthropologist Scott Atran suspects that "religious belief in the supernatural will be here to stay" only *despite* those who come to understand it scientifically (2002: 280). Meanwhile, other biologizers prefer to maintain agnosticism toward religious politics, apparently pursuing a scientific study of religion apart from biases and agendas. Scientific methods, they assume, offer to liberate research from ideological and theological debates.

With a broad survey of recent biologizers of religion, I point to the limits of both determinism and agnosticism, arguing that the lines between religion and the scientific study of it are not so clear. Biologizers depend on traditional ways of conceptualizing religiosity that have particular ideological connotations. In turn, self-described religionists are eager to respond creatively to scientific research, and in some cases they themselves have begun biologizing in

order to shed new light on their own religiosities. As a historical discussion will show, this should not be surprising. The concepts and practices of science and religiosity have not been static absolutes but are constructed variously, often in terms of one another. For all that scientific methods may offer the study of religion, they are not necessarily an escape from the influence of the theologies and ideologies that have long accompanied it.

The consequences of biologizing are more complex and difficult to predict than any one interpreter has yet been willing to admit. The assumption of Dennet and Atran that a scientific description of religiosity counteracts it, in turn, rests on a simplistic model of static identity and conflict between science and religion that has been amply refuted by modern experience. Instead, biologizing is a new move in the ongoing transformations that people have called religion or science, subject to such biases, imagination, and missteps that have always accompanied these undertakings. Following Thomas Kuhn (1962), my recognition that science is a human construction should not be taken to undermine its provisional value. Here, I treat biologizing as, on the one hand, a series of new directions for serious research, and on the other, a movement with religious vitality of its own.

Biologizing Religion

The work I review in the following pages covers what I take to be some of the highlights of recent biologized religion so far. These authors call themselves by a handful of names and are affiliated with a number of different disciplines. I account for them in three categories—cognitivists, neurotheologians, and evolutionary biologists—based on the communities they have formed and the methods they rely on. My inevitable picking and choosing emphasizes those

whose work has been most cited, as well as those who have taken the lead in interpreting it in the popular press. At this early stage, it is important to be at least as attentive to these interpretations as to the empirical work itself, not least because they will shape the motives and methods of future researchers.

As in any previous attempts to take account of religion, biologizers define their object of study in a number of ways. Because the concept of religion arises out of particular historical contexts, and because it is often so politically contested within them, any attempt to define it will be a value-laden exercise. Throughout these pages, I will draw attention to the conceptual lineages that researchers, consciously or not, draw from in so doing. I will point to their use of three traditional approaches: Humean (religion as beliefs), Jamesian (religion as experiences), and Durkheimian (religion as collectivity). Though each of the three represents a distinct emphasis, they emerged in conversation with one another and overlap. Each approach, in turn, shares roots and resemblances with certain theological and philosophical traditions, whose relevance should become apparent later on. As well as offering a definition of religion, each approach posits the role of science in elucidating it.

Approach and Its Leading Figure	**"Religion" …**	**"Science" …**	**Related Traditions**
Humean **(David Hume, 1711-1776)**	Consists in certain kinds of supernatural or counterfactual *beliefs*	Explains how such beliefs arise and how they manifest (by non-religious means)	Protestant *sola fide* (esp. *fide*), Enlightenment rationalism, naturalism
Jamesian **(William James, 1842-1910)**	Derives from interpretations of extraordinary *experiences*	Locates the (non-religious) psychological mechanisms that accompany such experiences	Protestant *sola fide* (esp. *sola*), Asian export mysticism, metaphysical religions, individualism
Durkheimian **(Émile Durkheim, 1858-1917)**	Arises out of *collectivity* in human societies	Traces the (non-religious) social-symbolic or evolutionary logic of religions	Catholic ecclesiology, Jewish *`am Yisrael*, nationalism, communitarianism

I do not mean to say that conceptual change has not happened since Hume, James, and Durkheim, or that these simplistic categories do justice to their subtle arguments. Rather, this sort of arrangement points out historical precedents and theological alignments. Nor do I mean to claim that all Humean biologizers are secretly (or not) naturalists or Lutherans. Instead, they tend to phrase their questions and answers about religiosity as matters of natural or supernatural beliefs, both in their research and their interpretations of it. Despite the new scientific tools biologizers have to offer, there remains a profound conceptual debt to earlier approaches.

While some biologizers do their work on religion in thoroughly professional contexts, others tend to be professional researchers whose ideas on religion appear to be more of a hobby —published in the popular press apart from peer-reviewed publications, by and large lacking scholarly sophistication. This fact marks a crucial distinction between those who have prioritized the effort to build a robust, self-critical community of researchers and those who prefer to make ambitious proclamations in the popular press. Effective natural science depends on a sociology of knowledge in which the pressure to produce repeatable, falsifiable, and empirical claims hedges against the bias of individuals. Evaluating the biologizers therefore means looking not just at their findings and interpretations, but also at the peer communities they are either creating or neglecting.

My summary begins with the scientific frameworks under which biologizers are working (along with the performative powers these frameworks wield), followed by the meanings and interpretations these researchers have attributed to their findings.

Cognitivists

Many of the most sophisticated biologizers today fall under the "cognitivist" label, bringing a half-century of experience in cognitive science to bear on religiosity. These tend to be anthropologists, psychologists, and religious studies scholars publishing in peer-reviewed journals and in books with university presses. As a community, they are working to build a comprehensive explanation of religiosity—including beliefs and practices—in terms of universal mechanisms in the human mind. Conceptually, they draw most heavily on the Humean approach by thinking of religion as emerging from the natural plausibility of certain kinds of beliefs in individual human minds. Those who deal principally with ritual, however, might tend also toward the collectivity-centered Durkheimian approach.

The general field of cognitive science emerged in the context of artificial intelligence research with computers after World War II. "The last 30 years of cognitive science," notes one observer, "can be seen as attempts to remake the person in the image of the computer" (Hutchins 1996: 363). In that same period, of course, computers have become ever more powerful and ever more woven into everyday modern life. Though the visions of the early artifical intelligence theorists have not quite come to be, we increasingly encounter computers in tasks where there once were humans, including security, customer service, manufacturing, design, and financial planning. As living becomes comprehensible in terms of interaction with intelligent computers, describing our species and its capabilities in computational terms seems possible as well. Through the metaphor of the computer, a machine that people can build from bottom up and understand, human intelligence begins to appear explainable in terms of its biological "hardware" or "wiring" running the learned "software" of experience—biologizing then becomes

a matter of computerizing. This paradigm's growth was fueled by the theory of generative grammar proposed by Noam Chomsky in the 1950s, which convinced many that mental processes can be usefully described in terms of computation. Coupled with the success of Chomsky's project, cognitive science represented a departure from the then-dominant behaviorist mode of psychology, which refused to explicate the internal logic of mental processes and looked only at how various influences condition behavior. Since then, researchers from a number of disciplines including linguistics, philosophy, and psychology have allied themselves with cognitive science, rejecting the limits behaviorist thinking imposed. Though it can trace its roots to the sociobiology controversy of the 1970s (Wilson 1975), the related field of evolutionary psychology began in earnest with Jerome Barkow, Leda Cosmides, and John Tooby's influential *The Adapted Mind* (1992). Habitually citing the significance of Chomsky (despite his skepticism for their approach), evolutionary psychologists add Darwinian reasoning to cognitive science and postulate that "the mind is a set of information-processing machines that were designed by natural selection to solve adaptive problems faced by our hunter-gatherer ancestors" (Cosmides and Tooby 1997). The evolutionary perspective is an indispensable ingredient to emerging cognitivist accounts of religion.

Over the course of the 1980s and 1990s, a theoretical and experimental framework for a cognitive study of religious belief began to emerge.[3] Anthropologist Stewart Guthrie's *Faces in the Clouds* (1993) expanded on a 1980 article and proposed to explain beliefs about supernatural beings in terms of an evolved human tendency to anthropomorphize what we perceive. The same

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[3] Slone's *Theological Incorrectness* (2004:51-64) has a good historical account and bibliography of the cognitivist approach to the study of religion. His *Religion and Cognition* (2006) collects some of the foundational papers.

mental systems that would have helped our ancestors spot a concealed predator in the bush, Guthrie argues, compel people to see spiritual beings behind the forces of nature and events in our lives. This same idea was at the center of David Hume's theory of religion as well, though of course it lacked a computational and evolutionary backdrop. With experimental studies and publications, anthropologist Pascal Boyer and psychologist Justin Barrett further probed the counterintuitive logic of supernatural representations, rendering Guthrie's anthropomorphism as a "hyper-active agency detection device (HADD)" (Boyer 1994; Barrett and Keil [1996] 2006). By evaluating how test subjects in a variety of cultural contexts intuitively described narratives about supernatural action, for instance, Barrett claims to elucidate the cognitive processes beneath, and sometimes opposed to, the formal theological formulations of religious beliefs. Based on a series of experiments conducted in several different cultural contexts, Barrett and Boyer argue that the "minimally counter-intuitive (MCI)" nature of virtually all "folk" supernatural beliefs (e.g., God as basically a person who happens to be all-powerful) makes them optimally memorable and therefore likely to be transmitted. The "folk" for cognitive anthropologists is an idealized naive human self embodied in biological limits that we all fundamentally experience, an only partly accurate perceiver of the world. With a decidedly Humean approach, these researchers set out to explain in scientific terms why such "counterintuitive" beliefs take hold of human minds. With a theory of memes—units of culture that perpetuate themselves among minds just as genes do among bodies—many cognitivists give religious beliefs an agency of their own, casting them as living parasites (Boyer 2001: 34; Atran 2002: 236; Dennett 2006: 78).

Meanwhile, a part of the discussion among cognitivists has centered around typologies of ritual behavior. Rather than most standard typologies, which are grounded in theological or other cultural meanings, this effort attempts to build typologies based on the cognitive processes that make rituals efficacious. For over a decade, the major authors on this scene are Harvey Whitehouse, on the one hand, and E. Thomas Lawson and Robert N. McCauley on the other. While Whitehouse (2004) divides his typology between "imagistic" and "doctrinal" modes with a focus on memory research, McCauley and Lawson (2002) distinguish between staid-but-frequent and occasional-but-stimulating rituals, based on a grammar of action reminiscent of Chomskian linguistics. To support their positions, these scholars depend on conventional ethnographic evidence as well as laboratory research in psychology and cognitive science. While the two camps differ on the formulation of a theory, both agree that the basic terms of the discussion are cognitive mental systems, for instance, the symbolic content of cultural systems alone, since cognitive minds are what cultural symbols depend on to survive. They also share the Durkheimian tendency to find the locus of religiosity in particular collective events, as well as a Jamesian urge to develop a science that describes these experiences in psychological terms.

By the early 2000s, the cognitivists had developed enough of a theoretical model grounded in enough evidence to produce several comprehensive synthetic works. Pascal Boyer's *Religion Explained* (2001), written for a nonexpert audience, is a readable and triumphant cognitivist manifesto. Anthropologist Scott Atran's *In Gods We Trust* (2002) is an impressive scholarly synthesis, which critically and constructively engages the ideas of cognitivists and several neurotheologians. There are a handful of others (e.g., Barrett 2004; Slone 2004). Several scholarly journals have taken up the cognitivists' work, including *Method & Theory in the Study*

of Religion and their own *Journal of Cognition and Culture*. Though so far lacking the popular appeal of the neurotheologians, Atran, accompanied by Barrett and Boyer, was the subject of a major cover story in the *New York Times Magazine* (Henig 2007). The cognitivists represent a growing paradigm in the study of religion, complete with internal debates, a growing public following, and graduate students.

Neurotheologians

While cognitive science treats the brain as a computer to be studied through inputs and outputs, neuroscientists, and consequently "neurotheologians,"[4] examine the inner workings of the brain as an organ using sophisticated imaging technology. For the most part, they are strictly Jamesians, looking to understand religiosity by turning scientific methods on peak experiences, which the subjects and researchers usually both agree to think of as religious. They disagree on what William James called "the too simple-minded system" of "medical materialism," which "finishes up Saint Paul by calling his vision on the road to Damascus a discharging lesion of the occipital cortex, he being an epileptic" (James [1902] 1929: 14). While all neurotheologians are interested in correlating peak, individualized experiences to known biological processes, many want to retain metaphysical, rather than medical, explanations for them. Others assert

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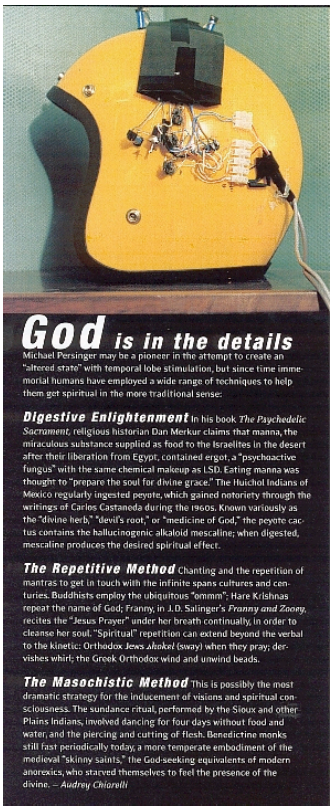
[4] The term "neurotheology" has an interesting pattern of usage. It was apparently first used in Aldous Huxley's novel *Island*, and first used to describe neuroscientific research on religion by James Ashbrook in the title of a 1984 *Zygon* article. Some, such as Rhawn Joseph (2001b, 2003) and Matthew Alper (2006), self-identify with it and seem to do so with pride. Others, particularly academic cognitivists, treat it as intrinsically pejorative, probably in connection with the pejorative usage of "theology" in secular religious studies. In a number of recent magazine articles, the term has been used enthusiastically (Hercz 2002; Peterson and Hamblin 2004; Elliott 2007). I use the term mainly for those who self-identify with it, as well as those with whom they are in close conversation.

materialistic reductionism just as James described it. Some neurotheologians suggest that the very concept of religion (or "spirituality") may actually have a direct biological basis.

In recent decades, brain science has had a growing impact on ordinary life in industrialized societies, and this impact has generated considerable explanatory currency. Nonscientist Matthew Alper, whose personal quest in *The "God" Part of the Brain* has become a cult classic, tells of his own conversion story to science after being prescribed psychiatric drugs: "Whereas in the past, however, in which I had admired the sciences, I now revered them. Science had saved my life. I was indebted to it. God didn't save me. I didn't save me. ... And so, the same faith that many placed in a god or religion, I now placed in science" ([1996] 2006: 11). It was this experience that turned Alper from seeking God through religions to probing religion with science. In addition to drugs, neurofeedback therapies that combine EEG scans with behaviorist-like conditioning are making the workings of our brains more accessible for clinical adjustment. Popular books offer "mind hacks"—neuroscientific tricks that one can try at home to improve cognitive performance. With the advent of such therapies that are able to transform the whole sensation of personhood through our brains, the salvific promise of religious authorities becomes renewed by laboratory researchers. In a recent study (Weisberg et al. forthcoming), several groups of participants were presented with short explanations for psychological phenomena. For all but the group of professional psychologists, the explanations that included neurological data were rated as more compelling even though that data contributed nothing substantive to the actual explanation (a control group of experts confirmed this). The authors conclude that in the public's perception, the "seductive details" and state-of-the-art technology of neuroscience now bear an unduly greater performative power than the language of conventional psychology. If

experiences like Alper's become more and more common through transformative therapies, so also will the explanatory authority granted to neuroscience continue to grow.



Michael Persinger's "God Helmet." From Hercz 2002.

One of the earliest and most-cited attempts to turn brain science onto religion was cognitive neuroscientist Michael Persinger's "God helmet" experiments in the 1980s at Laurentian University in Ontario. Widely published in scientific journals and a noted public speaker, he produced most of his research with funds from his private medical practice. In the early experiments, he modified a snowmobile helmet to direct electromagnetic fields at the brain's temporal lobes, which he and others surmised may be associated with religious experience (Persinger 1987, 2003). The results of these tests were both astonishing and controversial. Reportedly, 80 percent of the volunteers who donned the helmet had some kind of extraordinary experience, and of those, "most" sensed the presence of a personal being in the room. In the years since, these experiments have attracted public attention. Persinger's helmet has been featured in *Wired*, *Newsweek*, and the BBC. Richard Dawkins tried the helmet, as did fellow meme-theorist Susan Blackmore. While Dawkins reported little effect from the trial, Blackmore claims to have "had the most extraordinary experiences I've ever had" (Khamsi 2004). More recently, a team of Swedish researchers attempted to replicate the experiments using double-blind methods, which some of Persinger's trials lacked, and the new helmet seemed to have no

effect. While some have taken this as evidence against Persinger's approach, he insists that the Swedish helmet was significantly different from his own.

The idea of a "God spot" (so-dubbed in the title of a 1997 *Los Angeles Times* article) that Persinger pioneered caught the attention of a number of neuroscientists. V. S. Ramachandran, professor at the University of California, San Diego and bestselling author, has done experiments that reveal the religious proclivities of temporal lobe epileptics (1998), while Rhawn Joseph has argued in a series of flamboyant, self-published books (as well as an article in *Zygon*) for the centrality of the limbic system as the "transmitter to god" (Joseph 2001a, 2001b, 2003). Joseph even suggests that these areas "contain neurons that fire selectively in response to visual images of faces, hands, eyes, and complex geometric shapes, including crosses" (2001:60). Together, Persinger, Ramachandran, and Joseph all tend to assume that experiences that look "religious" should have their origin in a single brain center, giving the concept of religion its own neural correlate.

Probably the most influential neurotheologian today is Andrew Newberg at the University of Pennsylvania. Together with elder neuroscientist Eugene d'Aquili, he began devising experiments and writing preliminary theoretical articles for *Zygon* in the early 1990s. Eventually their findings first appeared in a book, *The Mystical Mind* (d'Aquili and Newberg 2001), and then a scientific article two years later (Newberg et al. 2001b), which Newberg has to date followed with three popular works about the research, each with plenty of spiritual musings (including Newberg et al. 2001a, 2006). All this reflects principally on a series of experiments he and his associates conducted, in which they examined meditating Tibetan Buddhist monks and praying Franciscan nuns with single emission computed tomography (SPECT) equipment (the

latest book has added Pentacostals' glossolalia to the list). Not only did he detect clear differences between normal brain states and peak spiritual experiences, but there were major similarities across the different groups. On the one hand, regions associated with thinking and planning showed a noticeable increase in blood flow. On the other, the images revealed decreased activity in the posterior superior parietal lobes, which Newberg calls the "orientation association area." These, in the terms he uses for popular audiences, manage the distinction between "me and not-me" (Newberg 2001: 4-5). Like Rhawn Joseph, Newberg also detected limbic system activity during peak experiences. However, he is less eager than Joseph or Ramachandran to localize religiosity in any one specific brain region.

Persinger, Ramachandran, Joseph, and Newberg, as well as others, all look for neural correlates to religious experiences that appear to exist across cultures. Accompanying a Jamesian concept of religion that privileges such experiences, they take the work of science to be one of identification and explication. James, like these researchers, considered the belief content that is so critical to many cognitivists to be epiphenomenal. While both cognitivists and neurotheologians formulate religiosity as an object of study enmeshed in biology, they understand the locus of that object differently. As much as they owe to Humean and Jamesian approaches, the choice between them also depends crucially on scientific technologies unavailable to Hume or James. The neuroscientific equipment used to study experiences still has only marginal access to the content of a mind's beliefs, while the computer-cognitive model relies on day-to-day belief processes rather than peak extremes.

Meanwhile, the neurotheologians' findings demonstrate significant public appeal, having been featured in numerous major magazines articles and radio broadcasts. Such reports readily

entertain metaphysical reflections on what these findings might mean, just as the scientists themselves do in their popular books. The wide interest aroused by the neurotheologians seems to confirm the "seductive allure of neuroscience" in the public mind. A discussion is only beginning to emerge in which experimental frameworks are being compared and critically examined (see, for instance, Azari 2004). Work on religion remains on the fringes of mainstream neuroscience, though this is beginning to change as more established neuroscientists, many with confessional interests of their own, turn their attention to it.

Evolutionary Biologists

Including brain science, biology as a whole seems perpetually poised to transform our world by intervening directly in the mechanisms of evolution. Already many of us are used to the idea of eating food that has been genetically modified in laboratories. The next astonishing steps on the collective horizon are, to some, horrific. On the one hand, Freeman Dyson (2007) imagines an empowering "domestication of biotechnology" in the next century, in which animals will be invented to suit human needs and diseases can be eradicated before they even occur. On the other, President George Bush's warning about "human-animal hybrids" alongside human cloning and stem cell research in his 2006 State of the Union address represents the caricature of a widespread concern. Meanwhile, less abrasively, a steady stream of careful work on animal behavior continues to materialize, raising new questions about the human-animal boundary both in present behavior and in evolutionary history. Vivid books by Jane Goodall, Dian Fossey, and Frans de Waal reveal how human-like the great apes can be, whether by fashioning tools, transmitting culture, or waging war. These findings seem to extend the reach of biological

context in explaining common features of human life. Just as a century ago evolutionary science forced many to rethink their religious creation stories, today it probes ever more deeply into our nature, even to what ingredients of so-called religiosity may be bound up there.

Anthropologist Barbara J. King, who has spent a career studying primates, has turned to religion directly in her popular-press book *Evolving God: A Provocative View on the Origins of Religion* (2007). Pointing to evidence of ape cognition, empathy, social rules, and meaning-making, then following it through a lineage of hominid archaeology, she suggests that "the fundamental building blocks of the religious imagination" can be found among animals (56). For her, the systems of emotional "belongingness" at work in ape societies are a "necessary condition" for religiosity in modern humans. The argument is more of an invitation for further research than a conclusive theory, and though on rather untrammeled ground, King is not entirely alone. A similar thrust is made in a small-press book by psychologist Jay Glass, *The Power of Faith* (2007), which explains religious devotion as an extension of submission to the dominant male in ape societies. Earlier, classicist Walter Burkert's Gifford Lectures, published as *Creation of the Sacred* (1996), points to resemblances between early religious stories and animal behavior.

When Dean Hamer's *The God Gene* was published in 2004 by Doubleday, it was accompanied by a cover story in *Time* by the same title. Hamer, a geneticist at the National Institutes of Health, had already made a name for himself on the controversy circuit by arguing for a "gay gene" ten years earlier, and predictably his new book generated a lot of attention. It argued for the significance of a particular gene, called VMAT2, in triggering spiritual tendencies in people. Hamer describes making this discovery alone and in his spare time, apart from his normal funded research at the NIH. In an addiction study conducted for other purposes, he

noticed that VMAT2 seemed to account for some participants' survey scores on a "self-transcendence" scale. While Hamer spends a good deal of time in the book qualifying the brazenness of his title (other genes are involved in religiosity, "spirituality" is more the dependent variable than "god," etc.), there remains skepticism about whether anything has actually been demonstrated. In *Scientific American,* Carl Zimmer's review (2004) suggested an alternative title: "*A Gene That Accounts for Less Than One Percent of the Variance Found in Scores of Psychological Questionnaires Designed to Measure a Factor Called Self-Transcendence, Which Can Signify Everything from Belonging to the Green Party to Believing in ESP, According to One Unpublished, Unreplicated Study*." Zimmer maintains, however, that shortcomings of the "god gene" theory mainly stem from Hamer's impatience to publish controversial books, and that future work in genetics may very well shed useful light on religiosity.

A more sophisticated evolutionary biological approach is David Sloan Wilson's *Darwin's Cathedral* (2002). Wilson, a biologist, combines group selection theory with Rodney Stark's rational choice model to cast classical Durkheimian functionalism as an evolutionary mechanism. He attempts to demonstrate that, by coordinating group activity, religiosity has a "secular utility" which caused god genes to succeed in the course of human evolution. While the logic of group selection is controversial among biologists, Wilson's application of it to religion is compelling.

Coming to the study of religion from their scientific disciplines, many biologizers eagerly embrace older, nonscientific frameworks that resemble their own. Hamer joins most of the neurotheologians as a self-declared Jamesian, explicitly privileging the genetic bases of

individual spiritual experience over the substrates of collective religious belief and practice. In contrast, Wilson and King cling to Durkheimian collectivity, constructing a concept of religiosity that depends on social forces. Meanwhile, they understand their science as offering an evolutionary theory that Durkheim and most of his followers never used. In these terms, both the cognitivists's beliefs and the neurotheologians' peak experiences become epiphenomenal—simply consequences of the fundamental evolutionary processes.

On the one hand, these differences between what I have called Humean, Jamesian, and Durkheimian approaches make clear how necessarily integrated a biologized account of religion would have to be. Behaviors with evolutionary origins in collective forces still must operate at some level through cognitive mechanisms encoded in organs like the brain. On the other, each approach represents a distinct way that religion can be constructed as the object of scientific study. While they may not ultimately exclude one another, each implies its own taxonomy of what phenomena constitute the quintessentially religious. Bringing new research techniques to bear on familiar approaches lends them a new performative currency. Rather than necessarily dissolving the theological and philosophical debates from which these approaches arose in the face of scientific investigation, biologizers are breathing new life into them.

Religionizing Biology

It is difficult to find anybody biologizing religion these days, especially in the popular press, who does not end up revealing strong feelings about the metaphysical implications of their work. For Matthew Alper, who comes to neurotheology at the climax of a personal quest, the question can

be laid out plainly: “With all our knowledge, there still remains that one ever-elusive piece of the puzzle, that one mystery which looms tauntingly over all the physical sciences, and that is the problem of God” (2006: 2). But just as there is no one way that biologizers construct their concepts of religion, how they interpret the religious consequences of their research exhibits no single telos.

For a number of people, Alper included, the suggestion that religiosity has its basis in biological mechanisms implies its falsity. Daniel Dennet would certainly agree. Most of the prominent cognitivists, including Boyer, Atran, and Guthrie, avoid polemic, but readers generally take them to be hostile to religious belief (e.g., Klinghoffer 2001). Their Humean orientation finds the impetus to explain religiosity in the first place from a sense of its strangeness to a naturalistic worldview, as well as posing the validity of religiosity in terms of the propositional truth of distinctly supernatural beliefs. If the origin of such beliefs is natural, rather than supernatural as they claim to be, they lose their claim to truth. Such oppositions, like natural against supernatural things and valid against invalid beliefs, are at the core of a Humean inheritance, and they can seem to make certain conclusions inevitable. Jesuit theologian John Haught, whose work champions a science-friendly Christianity, concludes that “if Boyer and others are giving us the ultimate and adequate explanation of religion, then of course we should acknowledge that our piety is pure fiction” (2002).

Perhaps this is not necessarily so. In Christian theology, psychologist Warren S. Brown and theologian Nancey Murphy of Fuller Seminary have worked to spark a wide-ranging discussion of brain sciences, and Murphy has recently taken an interest in cognitivist accounts of religion. Before them, James Ashbrook wrote theology that enthusiastically interpreted divine

imprints in neuroscience: “I find the use of the [brain as] metaphor deepening my religious convictions and clarifying my theological understanding” (1984: 335). Among those studying religion directly, leading cognitivist researcher Justin Barrett identifies as an evangelical Christian and has been an organizer for the youth ministry Young Life. “Why wouldn’t God,” he speculates in an interview, “design us in such a way as to find belief in divinity quite natural?” (Henig 2007) His *Why Would Anyone Believe in God?,* a summary of cognitivist research, spends its concluding chapters suggesting that cognitivist theories make a naturalist case against atheism: “Belief in God comes naturally. Disbelief requires human intervention” (2004: 123). When the research is presented in this kind of way, believers seem to receive it much more eagerly than either Daniel Dennett or John Haught might expect. A review of Barrett’s book in a Mormon magazine expressed enthusiasm for his rhetorical openness to theism, which “flies in the face of the conventional wisdom that dominates many graduate programs in psychology and psychiatry” (Peterson and Hamblin 2004a). The authors are glad to see that “neither coercion nor brainwashing nor special persuasive techniques need be invoked in order to account for widespread human belief in God or gods.” With cognitivist material, the subtleties of presentation appear to be the decisive question. When Boyer proclaims that religion has been “explained” away, the religious resist his ideas and jump to explain him away first (Klinghoffer 2001). Coming from Nancey Murphy or Justin Barrett, however, reactions to the very same theories and the same Humean approach can be quite different.

Among the neurotheologians, ultimate meanings flow even more freely. Since many of them keep their neurotheologizing at a distance from a more straight-laced scientific or medical career, there is less need for professional restraint. Andrew Newberg, who was featured in the

controversial documentary *What the Bleep Do We Know!?*, reads clear metaphysical messages into his brain scans of contemplatives. He believes he has found the "machinery with which the ego can be transcended" (Newberg et al. 2001a: 168) and that intuitions of "the mystics" are vindicated, for it now seems clear that "Absolute Unitary Being is a plausible, even probable possibility" (171). When similar patterns appear in the brain scans of meditating Buddhists and praying Christian nuns, he interprets this to demonstrate the common core of spiritual experience across religious traditions. Statements like this, while common in his books, are absent from his more sophisticated scientific articles (Newberg et al. 2001b).

Michael Persinger takes a more skeptical approach, seeing his helmet as a tool for stress reduction, a safe alternative to recreational drugs. "When Karl Marx wrote that religion is the opiate of the masses," one profiler explains, "he thought he was being metaphysical. Persinger thinks there's a good chance that Marx was writing the literal neurochemical truth" (Hercz 2002). He and V. S. Ramachandran, who specializes in work with brain-damaged subjects, both tend to treat religiosity in pathological terms—the result of a hyperactive brain region or undiagnosed mental illness. Meanwhile, Todd Murphy, "a Behavioral Neuroscientist associated with Dr. Michael Persinger," notes on his website that "I see things through my own eyes." There, he markets several "Shakti" helmets modeled on Persinger's God Helmet, "designed for intense Altered States." Affordably priced for ordinary consumers, Murphy's helmets plug directly into the sound card of a normal computer and feed signals through a special program to the brain via magnetic coils. These helmets, apparently, are in use at holistic medical centers for therapeutic purposes. Murphy makes clear that he has metaphysical ambitions with the helmets, featuring

articles on his website about "The Evolution of God," "Enlightenment," and "Darwinian Reincarnation."

Published by MIT Press, James H. Austin's massive *Zen and the Brain* (1998) helped launch Buddhist neurotheology, which is mushrooming into a movement of its own. Austin mixes medical materialism with a Zen sermon and holds high hopes for the effort: "Start by transforming only one person's brain, and whole societies may then undergo authentic change on a major scale" (3). The Dalai Lama has picked up neurotheology, too, through his "Mind and Life" conferences and a 2005 book on "the convergence of science and spirituality." Established neuroscientists (and meditators) like Sara Lazar and Richard Davidson are meeting this challenge and presenting work on meditation at professional conferences. But the presence of a figure like the Dalai Lama helps to reveal the ambivalence that the broader neuroscience community feels toward the enterprise; when he spoke at the 2005 Society for Neuroscience meeting, hundreds of scientists signed a petition protesting against his presence there.[5]

While many of neurotheology's leading voices tend toward spiritualities with Asian origins, Christians are beginning to take an interest in it as well. A new book by neuroscientist Mario Beauregard and journalist Denyse O'Leary, *The Spiritual Brain* (2007), has been promoted in Christian publications. Critics point to O'Leary's links with the Intelligent Design creationist movement, and the book is featured on the Discovery Institute's website. Reminiscent of Intelligent Design, the authors assume a "nonmaterialist approach to the mind" and use it to fashion a scientific case for the possibility of the soul. Having recently completed a second

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[5] The petition was actually prompted by the political concerns of society members loyal to Communist China. It did, however, become an opportunity and a platform for scientific concerns as well.

doctorate in theology, Nina Azari combines her neuroscientific research (including the first study of Christians specifically) with sophisticated philosophical and theological reflection. She points to several of the methodological shortcomings of neurotheologians, including the naive reductionism of Persinger and Ramachandran, as well as the extravagant conclusions to which Newberg comes in his popular books. Like Newberg, however, she suggests that together these studies "legitimate self-reports of personal religious experiences" across cultures (2004: 256) and disclose a pattern of "relationality" in religiosity generally. In these terms, she attempts to open the door to conversation with process theology as well as allied forms of feminist, embodied, and liberationist thinking. Ultimately, she has in mind a collaborationist dialogue between scientific research and religious practice. "Rather than fearing or ignoring forthcoming neuroscientific studies of religious experience," Azari suggests that believers "may want actively to participate in the interpretation of new findings" (256-57).

Still, Christian interest in neurotheology has been noticeably lukewarm so far. A Baptist news service recently took care to publish an article assuring that such research will probably not "cause faith to wane"; it might, instead, "help determine the difference between someone who is mentally unstable and someone who is a visionary" (Elliott 2007). The same Mormon magazine that reviewed Barrett's book enthusiastically writes ambivalently about neurotheology. The authors wonder, for instance, if Joseph Smith's religious experiences can be understood any better through Newberg's meditating Buddhists (Peterson and Hamblin 2004b). Christian ambivalence to neurotheology might come as no surprise considering the research's Jamesian orientation. Historically, James's *Varieties of Religious Experience* has been received more enthusiastically by spiritual mavericks than traditional orthodoxies, in large part because the

Jamesian emphasis on individual experience puts theological categories like salvation, community, and sacrament on the sidelines. Meanwhile, it celebrates the kind of self-directed seeking that exemplifies many contemporary religious sensibilities (Bellah 1986).

Perhaps the strangest figure among the neurotheologians, though, is Rhawn Joseph, a neuroscientist with an impressive list of peer-reviewed publications, while also being an Adolf Hitler documentarian and successful playwright. In *The Transmitter to God*, he contends that "despite Darwin's rash claims to the otherwise [sic], we are in fact spiritual beings, and there is scientific evidence to support these beliefs" (2001: 289). The book's neurological account of religiosity fits into Joseph's extensive theory of human biological and spiritual evolution influenced by "ancient astronaut" theorist Zecharia Sitchin. While organized religion represents a conspiracy of homosexual priests against women, discovering a connection between religious experience and the brain's limbic system means that "each and every human is born with a brain and mind that serves as a transmitter to god" (9). Another book, *NeuroTheology* (2003), is a collection that includes chapters by Newberg, Persinger, Alper, and Atran, as well as many by Joseph himself, attempting to syphon others' evidence to support his conclusions (and some use him in the same way).[6] Both books are published by his own outfit in San Jose, misleadingly called University Press. In his eccentricity, Joseph represents the extreme of religionized biology —a (self-described) religious theory that derives from, rather than being opposed to, a biological account of religiosity.

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[6] On her website (http://www.susanblackmore.co.uk/Chapters/neurotheologyold3.htm), psychologist Susan Blackmore explains that she contributed to a first edition for which she was never paid, followed by some troubling interactions with Joseph. Her chapters were replaced by classic William James essays.

Among those I have called the evolutionary biologists, there is a less obvious polemic. With self-conscious agnosticism, they stress that their research does not bear on the question of whether divine beings or mystical states are metaphysically valid. Still, they all extend their research frameworks into claims about what constitutes real religiosity. Dean Hamer, who argues that his gene affects a person's "spirituality" as distinct from organized religiosity, mobilizes the Jamesian priority of individual experience to dismiss collective forms outright. While personal spirituality is a natural instinct with a genetic basis that enabled our ancestors to survive, religion is the product of misleading memes (2004: 13). David Sloan Wilson and Barbara J. King, on the other hand, emphasize collective forms and pay little attention to individual experience or supernatural beliefs. Wilson's "secular utility" and King's "belongingness" leave experiences and beliefs as basically extraneous to the critical function and value of religiosity, which is all the more evident when they turn to interpreting their findings. What admiration they have for the idea of religiosity they construct (while perhaps disagreeing with actual religious beliefs) rests on its power to facilitate group behavior. Together with Hamer's, their works read like secularized efforts to make claims about what is really important about the religious legacy of the human race.

These divergent interpretations that circulate among the biologizers and their readers poignantly reveal the religious vitality that scientific explanations of religion can have. While John Haught may feel forced to put aside his Catholic faith in the face of a neurological account of religiosity, others like Andrew Newberg, Justin Barrett, and Nancey Murphy seem primed to take his place at the pulpit. New Atheists like Richard Dawkins and Daniel Dennett, in this context, appear to be doing much the same thing in their effort to tear the pulpit down. It is also

no surprise that their fellow New Atheist, Sam Harris, sees no conflict among atheism, his pursuit of an Asian spiritual practice, and a degree in neuroscience. The categories are fluid; doing away with Dean Hamer's core religiosity of spiritual experiences would seem to leave David Sloan Wilson's collective forms intact. A total cognitivist account of god-beliefs would still leave Andrew Newberg's nontheistic meditators open to interpretation. The survival of religiosity in the face of science, it seems, depends on how that science decides on the concept of religion before the research even begins, as well as on how the religiosity decides to circumscribe science.

If religiosity is in fact a natural phenomenon, this should be expected. Barbara Herrnstein Smith's analysis of the cognitivists in her recent Terry Lectures turns their own claims against them: "Scientists studying religion are subject to the same general cognitive dispositions that they identify as natural to the human species and that they see as responsible for some of the central features of religion" (2006: lecture 4). This means the same tendencies to bias and misrecognition, as well as a common interest in evidence and coherence. Researchers seek out their data and interpret them from within the ambiguities of culture, discourse, and heuristics. Inside our humanness, Rhawn Joseph reminds us, "perception is reality" (2001: 285). Scientific techniques do seem poised to open up new lines of inquiry and new answers for the study of religion, especially if they are pursued with the rigor and self-critical care that some biologizers still lack. But that science of religion seems to offer at least as much to self-described religious imaginations as religiosity has to offer as an object of study for scientists.

Generative Ontologies

With the main orientations of recent biologizing laid out, it will be worthwhile to step back and see how they fit into broader patterns. Despite numerous attempts since the Enlightenment to establish clear demarcations between science and religion, experience and reflection show that the two have often been constructed in terms of each other. Ideas and social networks that people have formed under rubrics of either category share common worlds and common concerns even while the two discourses diverge. In particular, the ontologies—the theories of the real—that each has offered help to define (or define each against) the other.

The strong reading of Max Weber's "disenchantment of the world" ([1919] 1946) takes scientific enlightenment as a great steamroller rolling over religious enchantment by means of calculation, control, and scrupulous pursuit of the truth. Weber himself, of course, understood human religiosity in its many forms too well to draw such a conclusion, but others have been attracted to the steamroller's straightforwardness. A few decades earlier than Weber's pronouncements on disenchantment, John William Draper and Andrew Dickson White wrote important histories of the eternal "conflict" (Draper) and "warfare" (White) between science and religion. According to this model, explaining religion is the holy grail for the steamroller of science; once accounted for biologically, religious apologists will have no more ground on which to stand.

Meanwhile, others have insisted that the relationship between science and religion, understood rightly, is really a harmonious one. They point to Galileo's dictum that the Bible tells us how to go to heaven, not how the heavens go. Along these lines, nonbeliever and biologist Stephen Jay Gould (1997) suggested a decade ago that science and religion can be understood as

"non-overlapping magesteria," each with its own proper domain (one empirical, one moral) and never the twain shall meet. While the harmony model is popular especially among liberal theologians and scientists eager not to run into theological politics, it has done little to vanquish the conflict model's influence. Between the two models, however, in the twentieth century "religion and science" became an ongoing topic of academic and public conversation.

The necessary third approach, articulated by British historian John Hedley Brooke (1991) as the "complexity thesis," avoids the absurdities of both extremes. Brooke begins by arguing that neither "religion" nor "science" can be defined ahistorically and as a result, they hardly operate as entities stable enough to be either in conflict or in harmony. Instead, forms of religiosity have provided "presupposition, sanction, and motivation" for scientific research (42), just as they are capable of fostering public skepticism for scientific pronouncements. Religions have also gained symbolic currency from their association with scientific orthodoxy, just as they have from mutineering against it. To understand what seems to be happening to religion when it is biologized, the complexity thesis must be taken as the starting point. In the foregoing discussion, the interpretations and ultimate meanings that recent biologizers find in their research hardly fit into the neat dramas of conflict or harmony.

Complex Antecedents

In the United States, where most of today's biologizing takes place, recent historiography of religions helps to reveal some of the lineages out of which the contemporary complexity arises. Both drawing on Baconian rationalism inherited from Europe, Protestant evidentialism and metaphysical religions have come to inform how biologizers and their interpreters encounter

science through religious imaginations. Like evidentialists, they display abiding concern that scientific evidence might confirm or deny the truth of particular religious ideas. Like metaphysicians, they use the latest scientific research as material for new spiritual insights.

E. Brooks Holifield's important account of American theology before the Civil War (2003) stresses the role of evidentialist thinking in public religious debates—a preoccupation with articulating and defending the reasonableness of Christian doctrines. By the late eighteenth century, the threat of Deism and of naturalistic philosophy had become cause for a new defense of traditional teachings. American evidentialists, with roots in Anglo-Scottish thought, shared a common set of questions about the truth content of beliefs with David Hume to the point that, writes Holifield, "no critic of Christianity attracted more attention" among them. As the reach of scientific explanation and credibility grew, theologians sought to emulate forms of proof and evidence in natural science for their own reasoning (186-190). Englishman William Paley's *Natural Theology* explained the evidence for God's design in nature for nineteenth-century American seminarians, and on such arguments rested the confidence of Protestants before, and sometimes even after, Darwin. Ronald Numbers (2006) points out that, like the nineteenth-century evidentialists, modern creationists have preferred arguments that at least appear plausibly scientific, from the 1960s flood geology of Henry Morris to the 1990s "design inference" of Intelligent Design theorist William Dembski. In light of the evidentialist tradition, the interest of Christians like Mario Beauregard, Nancey Murphy, and Justin Barrett in scientific accounts of religiosity should not be surprising. Still, the historical trauma left by Darwinism on evidentialist confidence can also help to explain the resistance of some Christians to such research, especially when it depends on evolutionary assumptions.

With a significance in the whole of American religious history that scholars have only recently begun to appreciate, metaphysical religions have generally embraced the same Baconianism as the evidentialists alongside mind-oriented mysticisms drawn from European occultism and popular Catholicism, which in turn guided interpretations of other world religions. Metaphysicians have tended to weave popularized scientific ideas into their religiosity, making scientific progress into an opportunity for what they consider to be religious progress, often over and against more conservative religious institutions (as well as materialistic mainstream scientists) (Albanese 2007: 10-12). In the nineteenth century, Mary Baker Eddy's Christian Science taught the Bible as a textbook for spiritual medicine, while Helena Blavatsky proposed her own version of spiritual evolution as a corrective to Darwinism. Later, ideas from popularized accounts of quantum physics provided metaphysical movements like New Thought and New Age, historian Catherine Albanese writes, "with their own elegant 'scientific' theory to authorize an evolving spirituality" (398). Adapting scientific discoveries to a discourse of spiritual discovery, empirical research becomes an opportunity for religious insight. The popular writing of Andrew Newberg, who is associated with the New Age movement, displays just this kind of ambition for his neurotheology, as does that of Rhawn Joseph. Less overtly, the yearning for new religious possibilities made available by research is present among virtually all biologizers, whether they consider their orientations religious or not.

In certain respects, William James serves as the critical precursor to today's biologizers in his path-breaking application of physiology and psychology to religiosity a century ago, as well as his significance in religious circles, especially among metaphysicians. Ann Taves points to him as the herald of what she calls the "mediating tradition"— observers who affirmed both the

naturalness and the validity of unusual experiences (1999: 348-49). His investigations of spiritualists and Asian mystics alongside more mainstream Christians lent scientific legitimacy to the outsiders. In turn, these same communities came to embrace his scientific picture of an active unconscious as a source for religious categories (Albanese 2007: 416-17). The pragmatist theory of truth he articulated in his later years could serve to justify both scientific methods and the self-help orientation of metaphysicians in a single stroke. Meanwhile, it is amply clear as well from his "Conclusions" to the *Varieties*, as well as from subsequent scholarship, that James came to the investigation of religious experience through an abiding spiritual quest of his own.

In this context, Andrew Newberg's "Absolute Unitary Being" or Rhawn Joseph's alien astronaut theories both fit within a far older lineage of ideas drawing on both religious sources and scientific evidence. While some will (with cause) dismiss such extraordinary claims as bad science, we can at least recognize it as bad science with complex precedents.

Scientific Ontology and the Shape of Biologized Religiosity

This is an age in which we increasingly understand ourselves as biological beings. From the functions of our organs to the workings of our minds, we recognize a continuous network of chemical processes more or less mapped out by scientists and continuous with the working of the rest of the natural world. As Matthew Alper discovered, psychiatric medicines can transform and sometimes heal what feels like one's very soul. Martin Heidegger wrote, with concern, that in modernity "science is the theory of the real" (1977: 157), and this rings all the more true in modernized societies today than in his time. If a religiosity is to appear "real" in the eyes of those who take science as an account of reality, therefore, it must speak in terms of science. We see in

recent religious works by physicist Frank Tipler and biologist Francis Collins, as well as theologians like John Haught and Philip Clayton, that for some people a sacred cosmology must map to the "real" cosmology that scientists describe. And if it is to develop a "real" anthropology and psychology, as we have seen here, a religiosity may need to biologize. Heidegger would meanwhile insist, as this survey has aptly shown, that scientists' interpretations are necessarily guided by their concerns and perspectives; there is no raw data. Those coming to the study of religion with some concern for what should be done about it will build the science and the meanings that spring from it partly out of these concerns. Biologized religiosity is not a contradiction in terms. Rather, following Brooke's complexity thesis, it is yet another complex interaction. Some older traditions seem to biologize easily, while others encounter trouble. In any event, from neurotheologians to New Atheists, popular debates about the nature of religion are increasingly being fought on the terrain of biology.

The aspiration to scientific methods in itself points to areas where previous and current accounts of religion have failed to satisfy scientifically minded researchers, audiences, and believers. In this context, what is a theory of religion after the "decade of the brain" that cannot marshal a few brain scans to its defense? Or one blind to genetic adaptation now that the human genome has been sequenced? Why hasn't the latest computer technology been harnessed to test what our theories claim to explain? People now, especially those reared riding the waves of scientific progress, will tend to have different intuitive expectations for what constitutes a complete and satisfying theory than did the audiences of (for instance) Hume, James, and Durkheim. Though the biologizers inevitably draw from earlier conceptual frameworks, they bring the technologies and techniques that have led to breakthroughs in technology, pure

research, and medicine to bear on the old questions. As a result, disproportionate to their scholarly influence, they attract considerable attention in the popular media.

Predicting the future of biologized religiosity and religionized biology is not straightforward. Export versions of Asian religions in the West seem particularly eager to embrace certain kinds of biological study. With the blessing of the Dalai Lama, Buddhists and Buddhist sympathizers are using modern diagnostic technologies to study brains engaged in ancient meditation practices. The results are then being used to develop "mindfulness therapies" in medical contexts as well as to draw metaphysical conclusions. Articles about the work of Newberg and others like him have become commonplace in magazines devoted to meditation and yoga, and many of the latest generation of biologizing researchers come to the work from that direction. Apparently, certain nondualistic metaphysics of Asian traditions meld well with the search for neurological correlates. Once such correlates are found, as Newberg is so ready to declare, the experiences of ancient mystics have supposedly been newly vindicated—proven "real" in the modern sense. There may be conflicts to come, however. Beliefs like reincarnation and divinely guided evolution, which the Dalai Lama happens to hold, could cause trouble for a biologized Buddhism.

Much more so, certain strains of traditional Western religiosity seem ill-prepared for biological accounts of themselves. Habits of body-soul dualism can seem to stand in contradiction to the emerging scientific, materialist consensus about the nature of the brain. Nevertheless, biologizers Justin Barrett and Mario Beauregard show that the Christian evidentialist habit remains in force as they marshall their scientific evidence to the support of familiar doctrines. Perhaps the most significant expositor of such thinking is Sir John Templeton,

a wealthy Presbyterian with New Thought proclivities (thus combining evidentialist and metaphysical traditions) who has donated millions through his Templeton Foundation to research on the border between religion and science, including that of Beauregard and Newberg. His annual Templeton Prize promises a higher payout than the Nobel "for progress toward research or discoveries about spiritual realities," and it has typically been presented in regal form at Buckingham Palace. Templeton's is a significant performative achievement in its insistence that religious science and scientific religion are pursuits worthy enough to be bankrolled, and success in these fields deserves to be lauded at the highest level.[7]

It is at the fringes of established religious traditions that the generative potential of biologized religiosity becomes most clear. The twentieth century saw the rise of a great many new religious movements directly inspired by science, and the trend continues. Just as Scientology draws from proto-Freudianism and New Agers from quantum physics, Rhawn Joseph uses neuroscience to support his strange theories of human origins and the nature of true religion. As science has been used by metaphysical religions in the past, biologizing religion becomes an opportunity for departing from traditional dogmas in exchange for ideas that science seems to justify. In this way Andrew Newberg proclaims that real transcendence lies not in the beliefs that separate religions from each other but in the common experiences that unite them (Newberg et al. 2001: 162). He sees the grounds of a new spirituality in scientific research like his, rather than in ancient scriptures or prophetic leaders. Resisting the exclusivity of conservative religions, he finds common cause with Dean Hamer's self-identification as

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[7] As is so often the case in "science and religion" work these days, this paper owes some gratitude to Templeton money, ambivalently accepted. Many of my questions here were framed in conversations at a Templeton-sponsored conference in Lancaster, England, in July 2007, celebrating the work of John Hedley Brooke.

"spiritual but not religious." From this popular vantage point, individuals can learn and borrow freely from a variety of particular traditions, creating their own amalgamations (Bellah 1986). Even Daniel Dennett's New Atheism can be read as a biologized religiosity. He finds in the cognitivist ideas of Scott Atran and Pascal Boyer the ammunition for vehemently attacking religious belief, a self-assured denial that some critics claim seems religious in its own right. In these ways, ideas about reality coming from what is called science and what is called religion (or anti-religion) perform a generative function for both.

Concluding Questions

There are, I have suggested, two processes going on at once. The study of religion, in some quarters, is being biologized, even as that biology is being religionized. As such, these processes (which are probably one) become part of a common, familiar problem of imagining religion as an object of academic study. Scholars of religion who aspire to biological methods will bring latent ideologies to their work, informing their frameworks, their observations, and their interpretations. For them, biologizing will not mean "breaking the spell," but for most comers, transforming it somewhat. Religiosity biologized appears alive and well. That being the case, let me propose some questions to carry with us as biologizing efforts progress.

Clearly, different religious sensibilities react to different kinds of scientific approaches. While the Dalai Lama is eager to see brain scans of meditating monks, John Haught finds Pascal Boyer's account of his belief in God threatening. For this reason, scholars of religion should be sensitive to the varied topography of these encounters, rather than rashly taking Haught's opinion as proof that religion (as a whole) cannot endure investigation by science (as a whole). Which

particular religious communities seem eager to embrace which scientific methods, and why? In what ways are they incorporating scientific ideas? Are people using them to modify or confirm core traditional creeds? How does social, technological, and political context influence these encounters and appropriations?

Among scholars of religions, the different culturally and ideologically contingent formulations of religion as an object of study have given rise to confusion and widespread frustration. With each meaning something different by "religion," as well as by what constitutes a scientific explanation, recent biologizers have inherited these problems. Do biologizers, who have so far drawn heavily from past approaches, have an opportunity to develop new languages for accounting for religious phenomena? By relying on scientific vocabularies established in other contexts rather than on secularized religious ones, perhaps researchers can avoid some ideological traps. Rather than enshrining a culturally-specific and contested term like "religion" in the biological vocabulary, they might avoid it altogether (along with "faith," "transcendence," "God," "spirituality," etc.) in exchange for ones that more closely fit the particular research techniques. Cognitivist jargon like "hyper-active agency detection device" may be a good start, though its specificity gets lost on audiences in a book with a title like *Religion Explained*. Would avoiding such terms (which subjects themselves may use) necessarily represent an unacceptable reductionism, or can it help inform, rather than simply replace, more discursive phenomena?[8]

[8] These questions relate to forthcoming work by Ann Taves.

Finally, are biologizers developing conceptualizations of religious phenomena genuinely different from predecessors like Hume, James, and Durkheim?[9] It is already clear that people are using this research to explain and justify new ideas they deem spiritual or religious. In a world that becomes increasingly conversant with a biological anthropology, might people and institutions internalize specifically biological conceptions of religion, like distinguishing temporal lobe religion from lymbic system religion and assigning different ultimate value to each?

Biologizing, I mean to insist, is not simply a thing that happens to religiosity, or yet another means for explaining its existing mechanisms. Rather, the growing biological consciousness of modern society is being woven into existing religions, as well as creating new ones, and in so doing leaves a mark on the varieties of religious life.

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[9] Theodore Vial argues that as yet, no. Though I agree generally, Vial makes the mistake of judging the cognitivists on the completeness, rather than the empirical correctness, of their theories. Though Hume's explanation for the development of monotheism "is not very satisfying," Vial points out, "at least he has one" (2006: 363). This remark betrays, I think, a misunderstanding of what the discipline of scientific methods has to offer: Einstein is celebrated for his theoretical predictions that were confirmed by experiment, not for the ambitious but failed attempt at a unified theory.

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