Brain science on ethics: The neurobiology of making choices


I was invited to address the graduating students in the high school in Villa San Giovanni, on the occasion of my visit to Reggio Calabria, Italy, to receive the Premió Calabria 2002. My comments are summarized as follows.

I am a brain scientist. I have studied brains for half a century. I have taught thousands of students about brains. I have taught future doctors and nurses what they would need to know in order to diagnose and treat diseases of brains and minds. I have taught future engineers what they need to build better computers and robots for the information age. Most important, I have taught the future leaders of my state and country the principles of brain function that relate to ethics.

The greatest power of brains is their capacity to create their own futures. We call this property 'self-determination'. In order to create themselves, brains must learn about themselves and the world around them. They learn by taking action into the world. They create within themselves their visions of what they can do, what the world holds, what they want from the world, and what course of action will get them what they want. Brains thirst for the knowledge that enables them to act effectively.

Brains are not like sponges. They do not passively absorb whatever the world brings to them. They boldly, or timidly, thrust their bodies into the world and suffer the consequences of their actions. They learn from their experiences through their own bodies. Without bodies, there is no action. Without action, there is no learning.

Most scientists, philosophers, and sociologists preach determinism. Behaviorists claim environmental determinism, by which our parents, schools, friends and enemies make us who we are. Sociobiologists and geneticists claim genetic determinism, by which our genes have the first and final say.

But brains are not passive machines. They have the freedom to act within the constraints set by their genes, and to do the best they can with whatever their world brings to them, for better or worse. They assemble whatever knowledge they can get, and they choose the courses of action that seem most likely to bring rewards.

Here is the first principle of freedom. Each of us is born free. We are born with varying degrees of freedom. Those of us who are born into modern democracies, or into the ruling classes of despotic states, have the most freedom. Others born in bondage, or with tyrannical parents, have much less freedom. That is the luck of the draw. Some of us start with more, others with less, but everyone can and must choose something of the future.

Here is the second principle of freedom. Brains seek optimal degrees of freedom. We can choose by our actions to increase our freedom, or we can choose to give away what we have. Too little freedom prevents brains from achieving full self-realization. Too much freedom brings confusion and disorientation. That experience is frightening, as well as demanding and disagreeable.

Here is the third principle of freedom. The choices we make affect not only our personal freedom. Our choices also affect the freedom of others with whom we live. Brains do not grow and flourish in isolation. They repeatedly dissolve their internal structures and
reform them. They reform themselves to act in concert with others. Our brains realize their full potential only through the accompanying growth of others and of the societies in which we live. When we act and study alone, we isolate ourselves and weaken our freedom. When we act in concert with others, we enhance it.

We know these three principles from millennia of human experience. Now we also know the hard biological facts of brain growth and development, which tell us how brains operate. We know the chaotic dynamics by which brains create themselves. We understand the branch points that mathematicians call bifurcations, at which brains make choices. We know the chemical systems by which brains get rewarded and punished by the consequences of their own actions, and by which we experience emotions.

And we know how brains dissolve their structures by regressing to earlier stages of development, in order to make way for new growth. We experience dissolution most painfully in the catastrophe of falling in love. We cannot choose to fall in love, though we can choose not to, in pursuit of a lesser freedom that carries the price of loneliness. Paradoxically, here is the gift of a path to true freedom, if it is taken correctly. Falling in love. The risks are high, the path is arduous, and the rewards are immense. The greatest freedom is found in commitment to others.

Here is where ethics enters. We must predict and evaluate the consequences of our actions. Prediction and evaluation are the prime functions of brains. The reason we study is to acquire knowledge by which to strengthen these functions. We must first choose whether to increase or decrease our degrees of freedom by our actions. We must next choose whether to act for the costs and benefits of our own futures, or those of others.

On the one hand, those who have too much freedom may decrease it by accepting arbitrary limits. They can accept guidance from civil, religious, military, or neighborhood organizations, which make decisions for them. On the other hand, those who have too little freedom can only choose to act either rapidly and efficiently, or grudgingly and resentfully, but they have always the choice to create plans and fantasies for liberation.

You students here are among the elite of your generation. You are receiving the best education that your state can give. You are the future leaders of your state and country. We expect that you will choose to enhance your freedom. You already know, that if you choose unwisely to lie, cheat, steal, take drugs, or neglect your studies, you will diminish your freedom. You know, that if you choose wisely to work hard at your studies, cooperate with your families, and take good care of your bodies, you will enhance your freedom.

True leaders have deep understanding of themselves, and they have the self-control and command of situations that express true freedom. Here is your opportunity — today, tomorrow, and throughout your lives. You can choose and keep on choosing, wisely, whenever you are ready to do so. With talent, hard work, luck, and help from your family and friends, you may get what you choose, and, above all, find that it is worth having.
Do prayer and meditation really “work” in changing the way the mind functions?  
Is there a “God spot” in the brain where religious experience originates?  
Are humans genetically hard-wired to be aggressively violent, or morally altruistic, or both?  
Is philosophical dualism dead and monism triumphant? Can all religious and psychological experiences be explained in terms of chemical and electrical activities in the brain? Is the soul, at last, a scientifically outmoded concept?  
Yes, no, both, and no, no, no.

Now that we have those simple-minded questions out of the way, we can get on with the task of exploring the new frontiers of religion and brain-mind science. Enough research in both religious studies and cognitive neuroscience has been done to make this much clear: Prayer and meditation definitely do change the way the mind functions. There is no one specific neural region that triggers all religious experience. Humans are genetically predisposed toward both aggression and altruism. Philosophical monism is, at present, incapable of reducing all religious and psychological experiences to material brain functioning, and the soul remains a viable concept for understanding the fullness of what it means to be human.

I am not saying that people no longer argue about these questions. They do, and they will continue to do so for many years to come. What I am saying (along with all the contributors to this book) is that the time has arrived to move beyond those rudimentary questions and investigate the more complex and more interesting issues that have emerged in the dialogue between religion and brain-mind science.

In just the past few years cognitive neuroscientists have made several remarkable discoveries about the development and functioning of the brain-mind system. These findings raise fascinating questions about theological and philosophical conceptions of human nature. At the same time, recent investigations in religious studies (in coordination with anthropology, history, and critical theory) have disclosed new ways of understanding the complex, multi-dimensional qualities of human religiosity. This religious studies work has tremendous significance for cognitive neuroscientific theories about selfhood, agency, and consciousness. Soul, Psyche, Brain will bring these two realms of research together, offering a new introduction to this dynamic and growing area of study.

It should be emphasized at the outset that this collection of essays is part of a long tradition of Western scholarship investigating the psychophysiological aspects of religious experience. David Wulff’s monumental book Psychology of Religion: Classic and Contemporary (Wulff 1997) documents the efforts made throughout the 20th century to analyze religion in scientific terms and explain it in relation to natural biological processes. All four of the major pioneers Wulff identifies in the psychology of religion field—William James, Sigmund Freud, C.G. Jung, and G. Stanley Hall—were dedicated to the goal of discovering the deepest possible correlations between religious experience and brain-mind functioning. Psychology of
religion researchers have scientifically examined the effects of particular behaviors long associated with religion, including fasting, sleep deprivation, sensory withdrawal, breath control, dancing, meditation, prayer, and the ingestion of various psychoactive substances. Researchers have also investigated certain brain phenomena (endorphin release, temporal lobe epilepsy, hemispheric specialization) in connection with subjective reports of spiritual experience. The results of these studies have been impressive insofar as they show that 1) religious experience is indeed rooted in the body, specifically in the psychophysiology of the brain-mind system, and 2) humans have devised a wide variety of highly effective practices for altering consciousness in religiously significant ways. However, Wulff points out that something important is still missing in this research: “At issue is not whether neurophysiology plays a role in religious experiences—for presumably all experience is represented somewhere in the brain—but whether referral to brain and other bodily processes is the most appropriate way by which to comprehend them.” (Wulff 1997, p.112, italics added)

This is precisely what every chapter in this book is seeking—a more appropriate way of comprehending religion and spirituality in connection with the biological nature of our species. Each of the contributors is convinced, as am I, that religion and science can learn much from each other by combining their resources to explore the religiously activated brain. Every chapter offers a creative means of overcoming the conflict between absolutist positions at both extremes, both the pro-religion advocates who reject evolutionary science and the pro-science advocates who reject fundamentalist religion. Although the contributors use quite different approaches (more on the details of their chapters in a moment), they all agree that the present moment offers a particularly auspicious time for us to develop new integrations of religious studies and psychological science. Wulff seems to have seen this coming, as he makes the following prediction in the 1997 edition of his book: “No other approach in the psychology of religion promises as revolutionary a future as the biological one.” (p.112) As you will see in the following chapters, that future is well nigh upon us.

In addition to its psychology of religion context, this book should also be seen as the continuation of a longer history of Western reflection on the evolutionary basis of religion. Charles Darwin himself was the first to speculate on this subject, beginning in the mid-1800’s. From the start of his career Darwin recognized the significance of evolution for everything having to do with human mental life. “The mind is function of body” he wrote in an early notebook, and he foresaw, with a mix of gentlemanly trepidation and revolutionary excitement, that such a radical idea, if proven, would force a violent overthrow of many of the theological and metaphysical beliefs long cherished by the British upper class.

It is worth dwelling for a moment on Darwin’s experiences with religion. He was born in 1839 and raised in a well-to-do English family with a tendency toward freethinking atheism (something rather unusual for members of their elevated social class). Having failed at medical school, Darwin made a half-hearted attempt at becoming a minister in the Church of England. He was saved from that fate by the glorious voyage of the H.M.S. Beagle, on which he served as the ship’s official naturalist and upper-class companion for the captain. During his five-year circumambulation of the globe Darwin came face to face with the mysterium tremendum of Nature. His eyes were opened to the incredibly diverse and
interconnected phenomena of the natural world, and he experienced what were perhaps the most authentically spiritual sentiments of his life. The wild, verdant rain forests of South America inspired the twenty-seven year old Darwin to exclaim, “No one can stand unmoved in these solitudes, without feeling that there is more in man than the mere breath of his body.” Elsewhere he spoke of the jungles as “temples filled with the varied productions of the God of Nature.” (Desmond and Moore 1991, p. 191).

Alas, this transcendent experience did not have a lasting spiritual impact. The trajectory of Darwin’s intellectual development was decidedly away from church, Bible, and religion in any form whatsoever. His experiences aboard the Beagle had shown him how puny humans are in the grand scheme of Nature, and he rejected Christian teachings about the special supremacy of humans in the created world. He felt that all the waste and violence in the world made a mockery of belief in a benevolent God, especially so after the deaths of his father and his beloved daughter Emma. These agonizing losses prompted Darwin to give up any pretense of Christian faith. He did not, however, join with those of his scientific comrades who were using evolutionary theory as a rhetorical weapon against organized religion. Darwin ended his days as a private but resolute agnostic, with no personal belief in God or an afterlife and yet no desire to force other people to believe as he did.

Still, Darwin continued thinking about religion and evolution, and two of his speculations are direct precursors to the major topics of this book. One is his idea that religious faith is not necessary for moral development or psychological maturity, because evolution has endowed humans with social instincts that naturally incline us to form and maintain bonds of friendship with other people. The Golden Rule, in Darwin’s view, is a product not of divine decree but of evolved instinct. Second is the admittedly heretical idea that perhaps the experience of God can be explained as nothing more than the effect of a particular state of brain organization. Darwin saw quite clearly how materialist implications could be derived from evolutionary theory, implications that would be deeply disturbing to religious believers and would undermine the legitimacy (and political power) of church teachings.

Darwin’s influence on current brain-mind research cannot be overestimated. The evolutionary processes he identified remain the primary framework used by cognitive neuroscientists to explain their findings. Specifically, Darwin’s views on religion and other aspects of human psychology have spawned a growing literature in the evolutionary analysis of religious beliefs, rituals, and experiences. Particularly noteworthy in this regard are Pascal Boyer’s Religion Explained (Boyer 2001), Ilkka Pyssianen’s How Religion Works (Pyssiainen 2001) and Thomas Lawson and Robert McCauley’s Rethinking Religion (Lawson and McCauley 2002). These works carry out an essentially Darwinian project of reducing religious phenomena to their material basis in the biology of human evolution. By contrast, the chapters in Soul, Psyche, Brain, though deeply informed by Darwin’s thought, do not stop with the materialist level of explanation. They take the materialist findings of brain-mind science and use them as a platform to ask new questions, questions about the future potential of our still evolving nature, questions about our capacity for creative imagination and spiritual growth, questions about our understanding of what it means to lead a good, fulfilling, fully realized human life. If anything, this book is a call to return to Darwin’s rapturous experiences in the Brazilian rain forests. His own theory make no place for such experiences of “unchurch spirituality,” but the
contributors to this book will show that the fullest extension of Darwin’s evolutionary thought must include an openness to these religiously-charged dimensions of human existence.

A third context for this book is the one that reveals its greatest limitations. The title *Soul, Psyche, Brain* is intended to highlight the multiplicity of terms and concepts used in human efforts to know ourselves. *Soul* is the term favored by many religious believers, *psyche* is the defining concept of the discipline of psychology, and *brain* is the central focus of cognitive neuroscience. There are obviously great differences between these terms, and much of this book will be devoted to exploring their various meanings. However, it should be just as obvious that all three terms share a common cultural foundation in Western civilization. To the extent that almost all the chapters of this book work within the conceptual universe defined by the trio of terms soul, psyche, and brain, the result is that many other ways of thinking about these issues will be neglected. The only exceptions are the chapters by Kahn and Simone (5) and Payne (8), both of which discuss Western psychology in connection with Buddhist points of view. This is actually a fair reflection of the current dialogue between religion and brain-mind science, at least in the U.S. Most of the discussion involves Christian theology in connection with Western psychology and neuroscience, with a small but growing interest in Buddhism. How does this Western discussion relate to the rich traditions of self-knowledge in Islam, Hinduism, and the indigenous cultures of Africa, Australia, and the Americas? Unfortunately you won’t get much of an answer to that question in the present book. But at least you won’t get a wrong answer, which is unfortunately what happens when researchers use brain-mind science as an exhaustive (and dismissive) explanation for all the world’s religious and spiritual traditions. If nothing else, the contributors to *Soul, Psyche, Brain* agree that future progress in this field depends on greater humility, open-mindedness, and willingness to learn from others.

Let me say a few words about each of the chapters and their authors. The first is “Genes, Brains, Minds: The Human Complex,” by Holmes Rolston III, a venerable professor of philosophy at Colorado State University and for many years a leading voice in the study of religion and science. Rolston begins with a wide-angle consideration of how our brains are shaped by the genetic inheritance of the human species. He shows how the emergence of culture allowed for tremendous advances in human psychological development, to the point where we now have a capacity for spiritual experience and self-transcendence. Just as he argued in his 1997 Edinburgh Lectures (later published as *Genes, Genesis, and God*), Rolston says the amazing new discoveries of evolutionary biology do not disprove religion in any simplistic way, but rather enrich our understanding of moral goodness, creative genius, and existential self-awareness.

James Jones of Rutgers University brings his experience as both a clinical psychologist and a religious studies scholar (along with a training in the philosophy of science) to bear on the subject of his chapter, “Brain, Mind, and Spirit—A Clinician’s Perspective, or, Why I Am Not Afraid of Dualism.” As already mentioned, the mainstream consensus among neuroscientists is that consciousness is a by-product of physical activities in the brain. There is no disembodied soul or purely rational mind—everything we feel, think, and experience can be explained in terms of brain neurophysiology. Many theologians and religious studies scholars have already challenged that materialist approach, though as Jones shows in his careful
analysis of Nancey Murphy’s recent work, these religious responses are themselves inadequate in helping us understand the complex realities of human consciousness and spiritual experience. Jones pushes back hard against the neuroscientific claim that the mind-body problem has been solved in favor of monism over dualism, and he argues that a brain-centered approach cannot account for the counter-monistic findings of research in behavioral medicine, meditation, hypnosis and other fields of psychophysiology.

Stanley Krippner’s long career as a globe-trotting, anthropologically-informed psychologist is the foundation for the third chapter, “Psychoneurological Dimensions of Anomalous Experience in Relation to Religious Belief and Spiritual Practice.” The psychology of religion has always taken an interest in unusual modes of awareness, knowledge, and power. Both Freud and Jung studied the precognitive dimensions of dreaming, while James examined people who claimed to be mediums. Recent findings in the neurosciences are adding new pieces of information to our understanding of such extraordinary psychological phenomena, and Krippner (of the Saybrook Institute) provides a concise survey of what is currently known about rare but emotionally and physiologically charged occurrences like telepathy, mysticism, meditation, intensified dreaming, and near-death experience. Krippner emphasizes that anomalous experiences like these are not innately pathological or disordered; rather, they reflect the unusual activation of brain-mind processes that are, in their ordinary condition, increasingly well understood by modern psychology.

Chapter 4, “Sacred Emotions” by Robert Emmons, considers the implications of perhaps the biggest change produced by cognitive neuroscience in our understanding of human nature—the discovery that reason cannot function without emotion. The psychological ideal of a purely rational mind, which goes back to Enlightenment philosophers like Descartes and Kant, has been exploded by neuroscientific research showing that human reasoning abilities suffer terribly if we lose our capacity for emotional experience. We cannot be healthy and whole without emotions. Emmons, a psychologist of religion at the University of California, Davis, argues that in light of these findings we should reconsider the role of emotions in religion, particularly the way religions provide a context and direction for emotional experience and expression. He points to the considerable number of studies on “positive” emotions such as gratitude, awe, reverence, wonder, hope, forgiveness, and joy, all of which are regularly associated with a spiritual orientation toward life. For Emmons, the recent findings of psychological science are vitally important because they refute a simplistic, unidirectional brain→mind view of causality, and reveal instead a complex and dynamic interplay between the body, the mind, culture, and religion.

The practice of Zen Buddhist meditation is the subject of Chapter 5, “Where Neurocognition Meets the Master: Attention and Metacognition in Zen.” Tracey Kahan and Patricia Simone, a psychologist and neuroscientist respectively at Santa Clara University, bring together a wealth of new evidence demonstrating the extraordinary qualities of brain-mind functioning during Zen meditation. Many psychological studies have shown that the human capacity for “metacognition,” i.e., thinking about thinking, is basic to our self-awareness, emotional regulation, and long-term planning. Of special interest to Kahan and Simone is the capacity for selective attention, which involves the metacognitive process of deciding which perceptions, feelings, and ideas to attend to and which to ignore. What Zen
meditation is able to do, according to Kahan and Simone, is discipline people’s attention and sharpen their metacognitive focus so they can achieve and then sustain a present-centered awareness. Carrying on James Austin’s project in his monumental book *Zen and the Brain* (Austin 1998), Kahan and Simone further enrich our understanding of the way certain spiritual practices can dramatically transform brain-mind functioning.

David Kahn’s “From Chaos to Self-Organization: The Brain, Dreaming, and Religious Experience,” offers a state-of-the-art report on the neuroscience of brain development. Kahn’s work at Harvard Medical School’s Department of Psychiatry has focused on the neural and psychological dimensions of dream experience, and in this chapter he uses dreaming as an illustration of a crucial insight about the way the brain functions. The brain, he argues, is a self-organizing system whose healthy and creative development depends on a constant, lively tension between structure and chaos. Kahn’s argument may be discomforting for religious believers insofar as he claims no special creator is necessary to account for the emergence of human intelligence. But scientific materialists may be equally as disturbed by Kahn’s evidence showing the inherently free, unpredictable, open-ended nature of human consciousness.

Kahn’s interest in the neuroscience of self-organization is, despite its very different academic perspective, quite similar to the main topic discussed by psychology of religion scholars Patricia Davis and Lewis Rambo in their chapter, “Converting: Toward a Cognitive Theory of Religious Change.” The religious phenomenon of conversion, which Rambo has studied extensively, involves varying degrees of individual choice, along with multiple influences at the sociological, cultural, and psychological levels. By using the metaphor theory of cognitive linguist George Lakoff to analyze the language used by Christian converts as they describe their experiences, Davis and Rambo develop a new way of understanding the complex interplay of religious meanings, psychological functioning, and individual choice in experiences of conversion. What comes of Davis and Rambo’s analysis is the recognition that, at least in the case of Christian conversion, the process of religious change is characterized by unpredictable bursts of growth in cognitive complexity and self-awareness.

As illustrated by the Davis and Rambo chapter, much work has been done exploring the connection between specifically Christian religious traditions and brain-mind science. Charlene Burns’ chapter “Cognitive Science and Christian Theology” gives a masterful overview of this particular area of religion-science dialogue. Burns, who teaches philosophy and religion at the University of Wisconsin, Eau Claire, gives special attention to the implications of brain-mind science for Christian theological claims about the soul. Burns critically reviews the ideas of the major researchers who have tried over the past several decades to correlate Christian belief with cognitive science, and much like James Jones in Chapter 2 she rejects the “nonreductive physicalism” proposed by some contemporary theologians, even though that theory does mark an advance over the materialist reductionism of scientists who believe consciousness is a mere epiphenomenon of brain functioning. As an alternative to these unsuccessful theories Burns points to resources in the Christian tradition that conceive of the human soul as a psychosomatic unity emerging in relation to a broader cultural community. One does not have to be a
Christian to appreciate the contemporary significance of these historical teachings about the embodied soul.

All of these issues look different when considered from the perspective of another religious tradition. Richard Payne, dean of the Institute of Buddhist Studies at the Graduate Theological Union, explores in chapter 9 the connection between Western psychology and Buddhist teachings on the nature (and non-existence) of the self. “Overcoming an Impoverished Ontology: Candrakirti and the Mind-Brain Problem” is devoted to the work of medieval Indian philosopher Candrakirti, who provides an especially lucid expression of Buddhist approaches to psychological self-awareness. In addition to providing a detailed portrait of Candrakirti’s prescient ideas, Payne’s chapter describes the long Buddhist history of careful philosophical analysis of the mind-brain question. Payne compares these teachings to recent Western psychological and anthropological work on the constructive nature of human perception, cognition, and selfhood. A new Western appreciation for the self as a social construct, combined with the ancient Buddhist spiritual quest for release from the illusion of the self—this is the possibility Payne wants us to consider. His chapter, along with chapter 5 by Kahan and Simone, points to an important (and non-Christian) direction for future investigation.

Chapter 9 presents my work on religious and psychological approaches to dreaming. “Religion and Brain-Mind Science: Dreaming the Future” brings together the leading findings about dreams and dreaming from both sides of the dialogue—historical and anthropological studies on the one hand, psychological and neuroscientific research on the other. We have learned a great deal in recent years about the many roles dreams have played in religious beliefs, practices, and experiences from cultures all around the world. We have also learned much about the basic neurocognitive processes that are and are not activated during REM dreaming. The best and most fruitful way of integrating these two areas of research (so I argue) is to study the phenomenology of what C.G. Jung called “big dreams,” i.e., dreams that are extraordinarily intense and vivid, with striking images, physiological carry-over effects, and a high degree of memorability. The cross-cultural occurrence of big dreams, combined with their rootedness in the brain, strongly suggest the possibility that such dreams serve powerful adaptive functions that can be explained and understood in evolutionary terms, the sine qua non of Western psychological science.

The penultimate chapter, “Religion Out Of Mind: The Ideology of Cognitive Science and Religion,” is by Jeremy Carrette, a psychologist of religion at the University of Kent whose work centers on a critical reappraisal of the social, economic, and political factors that have shaped, and continue to shape, the psychological study of religion. Carrette examines the recent work of evolutionary psychologists and cognitive scientists (particularly Lawson and McCauley) who claim to have identified the fundamental and universal mental processes that give rise to religion. Carrette forcefully challenges the unspoken assumptions and biases that pervade Lawson and McCauley’s assertions. Without dismissing scientific research in its entirety, Carrette calls into question the automatic authority that cognitive scientists are granted in Western society, and he makes us more aware of the subtle but powerful ideological influences shaping everyone’s work in this field of study, including our own.
Walter Freeman, a neuroscientist at the University of California, Berkeley, reflects on the broader social implications of brain-mind research in the last chapter, “Brain Science on Ethics: The Neurobiology of Making Choices.” Originally presented as an invited address at a high school graduation in Italy, Freeman’s brief chapter will hopefully encourage readers to think carefully about what moral, political, and spiritual lessons they draw from the latest findings of brain-mind research. Like David Kahn, Freeman appeals to research on chaos, complexity, and non-linear systems in arguing that the human mind is fundamentally free and has the capacity to create its own future. If we accept Freeman’s claim that the scientific materialists are wrong about psychological determinism, and if humans are indeed blessed with the capacity for free moral choice, then the ethical and spiritual teachings of the world’s religious traditions become valuable resources in the future scientific study of the brain-mind system.

It will, I hope, come as no surprise that the book will end without a formal conclusion. No need to impose an artificial sense of closure on these issues—the future of religion and brain-mind science is truly wide open. We are living at a time when our sources of information about both religion and brain-mind science have far outstripped our theoretical understanding of how the two areas relate to one another. This gap is likely to widen in coming years, as religious studies scholars continue to analyze and evaluate religion’s increasingly significant role in global life and conflict, while cognitive neuroscientists discover ever more detailed features of brain-mind functioning. The only thing we know right now is that the traditional frameworks used by both religion and science are, by themselves, inadequate to the task of making sense of this surging cascade of new information.