

# *Thinkpiece*

## RANDOMNESS, CONTINGENCY, AND FAITH: IS THERE A SCIENCE OF SUBJECTIVITY?

*by Steven L. Peck*

*Abstract.* Materialists argue that there is no place for God in the universe. Chance and contingency are all that structure our world. However, the materialists' dismissal of subjectivity manifests a flawed metaphysics that invalidates their arguments against God. In this essay I explore the following: (1) How does personal metaphysics affect one's ability to do science? (2) Are the materialist arguments about contingency used to dismiss the importance of our place in the universe valid? (3) What are the implications of subjectivity on belief and science? To answer the first question, I examine the later years of Sir Alfred Russel Wallace, one of the cofounders of evolution through natural selection with Darwin. His belief in nineteenth-century spiritualism profoundly affected his standing in the scientific community. I describe the effect of spiritualism on Wallace's science. To answer the second question, I use my own work in mathematical modeling of evolutionary processes to show that randomness, and contingency at one level, can actually be nearly deterministic at another. I demonstrate how arguments about chance and contingency do not imply anything relevant about whether there is a designer behind the universe. To answer the third question I begin by exploring a paradox of consciousness and show how the existence of subjective truths may provide a paradigm for sustaining a rational belief in God. These questions form the framework of a structured belief in a creator while yet embracing what science has to offer about the development of life on our planet.

*Keywords:* consciousness; emergent property; evolution; God's existence; Søren Kierkegaard; materialism; mind-body problem; subjectivity; supervenience; Alfred Russel Wallace.

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There has been a recent flurry of books and papers on the compatibility of evolutionary biology and religion (Dawkins 1996; Gould 1999; Miller 1999; Rolston 1999; Peterson 2000; Pollack 2000; Shermer 2000; Arnhart 2001; Ruse 2001). I find this both refreshing and reassuring, because I am a religious evolutionary biologist. Despite the ongoing and healthy dialogue between those who believe in God and those who do not, there seems to be a misunderstanding on both sides of the debate over the implications of contingency and randomness to the religious believer. In particular, some (e.g., Dennett 1996 and Dawkins 1996) have argued that the contingency and stochasticity of evolutionary processes suggest that the universe is without purpose or design. While I appreciate the appeal of these arguments, I disagree that randomness and contingency imply an empty and ontologically meaningless universe. Furthermore, the metaphysics behind their arguments has too frequently been ignored (Wallace 2000). As an evolutionary biologist I have spent most of my research in climbing, as Dawkins (1996) calls them, "Mount Improbables" in computer simulations of evolutionary processes, and I find their argument that this stochastic and contingent universe necessarily implies no design or purpose unconvincing and flawed.

As I invoke the word *design*, I am concerned that you will cast me in the pit with the creationists (including the so-called intelligent-design creationist movements). I do not want that. If you read my publications or had a discussion with me, I suspect you would easily place me with any other group of evolutionary biologists. However, I do believe that the universe has a purpose but was not brought about suddenly or with constant interventions from God. If you were to ask me about the age of Earth, the evolution of Earth's biota including human beings, or anything dealing with evolution, you would find my opinions typically mainstream science. While I question particulars, as do all evolutionary biologists, as to some aspects of evolution (e.g., What are the modes and rates of sympatric speciation?), I accept without hesitation that evolution has occurred and continues to occur. It is the unifying principle of biology and explains the myriad structures we see today in Earth's biota. I am committed to the scientific agenda in understanding our universe. I do believe, however, that we were created ultimately by a God that delights in freedom, richness, and beauty and that the universe was fashioned in such a way that we were an inevitable part of its processes.

A common thread of misunderstanding runs through materialist literature on the nature of faith and the power of subjective truth. Materialists insist that science, and especially evolutionary science, has dispelled religion by explaining its existence as an evolutionary artifact of intelligence evolution (perhaps arising by giving an advantage in hunting or securing mates, or as an invasive meme that has been exceptionally successful in spreading in our big-brained species of ape [see Dawkins 1996; Dennett 1996; Blackmore 1999]).

I sense that most materialists do not understand religion. To them, people of faith seem to have decided to believe something for arbitrary and infeasible reasons—perhaps they were raised that way, or the Bible says so and because of its historical holiness they believe it, or they have decided there is a God and they are going to believe it whether there is evidence for it or not. Stephen Jay Gould (1999) saw religion merely as an ethical system and had no qualms about allowing a place for religion as long as its practitioners stuck to their “magisterium” and as long as religion stayed only in the realm of providing an ethical framework for human behavior. But he clearly felt that there is no basis for religion ultimately, that is nothing more than a useful strategy designed by evolution to help us survive as social creatures. Michael Shermer (1997) holds that such beliefs are “weird” and that thoughtful persons ought to be able to escape the evolutionary heritage of superstition we have inherited (Shermer 2000); Science (with a capital *S*) is the answer to the world’s problems. Recently, V. V. Raman (2001, 549) defined faith as “accepting without questioning, and sometimes in spite of apparent logical inconsistency.”

I am sure there are some people who believe in God for irrational reasons. But I find that most people of faith enjoy an inwardness that provides a profound sense of worth and reality. Faith is not without reason. Faith is certainly not belief without questioning (although it inappropriately can be). It is not without basis. But that basis is found in subjectivity.

Subjectivity is a creature of such mystery that science has largely left it alone (Wallace 2000) or called it nonexistent (Dennett 1992; Blackmore 1999). As B. Alan Wallace has written,

*Strictly speaking, at present there is no scientific evidence even for the existence of consciousness.* All the direct evidence we have consists of nonscientific, first-person accounts of being conscious. The root of the problem is more than a temporary inadequacy of the technology. It is rather that modern science does not even have a theoretical framework with which to conduct experimental research. (Wallace 2000, 3)

Materialist arguments, in particular those of Daniel Dennett and Richard Dawkins, have disallowed any place for God in the universe. They argue that, given the laws of physics, chance and contingency are the best explanation for understanding the world. However, if their personal metaphysics are flawed, their ultimate conclusions are likely to be as well. The materialists have also largely ignored subjectivity or dismissed it as irrelevant. I believe this introduces flaws in their perceptions that weaken their arguments against God. In this essay I explore the nature of these flaws by examining three questions: (1) How does personal metaphysics affect one’s ability to do science? To explore this question I look at Alfred Russel Wallace’s attempt to rationalize nineteenth-century spiritualism. (2) Are the materialist arguments about contingency used to dismiss the importance of our place in the universe valid? (3) What are the implications of subjectivity on

belief and science? Are there truths that cannot be reached through science? Are there subjective truths? If so, is there a science of subjectivity? The questions may seem diverse, but they are united by their questioning materialists' claims that science is the ultimate arbitrator of truth. Examining these three areas will give an apposite look at why materialism fails.

#### METAPHYSICS AND SCIENCE

*Alfred Russel Wallace—When Objectivity Fails.* Perhaps one of the most intriguing characters to have created a unique metaphysics that combines elements of science and an alternative worldview was Alfred Russel Wallace. Wallace, independently of Darwin, articulated the mechanism driving evolution: natural selection. On 9 March 1858, Wallace mailed Darwin his paper "On the Tendency of Varieties to Depart Indefinitely from the Original Type." The paper, based on Wallace's observations and ruminations on species diversity and origin during his travels in the Malay Archipelago, was written while Wallace was sick with malaria in Ternate. Darwin, who had been working independently on the mechanism of species change, was horrified to discover that he might lose priority. His friends Sir Charles Lyell and Sir Joseph Hooker, two of the most prominent scientists of the nineteenth century, urged Darwin to quickly draft a paper based on his notes and thinking about species origin. Both papers were read by Darwin at the 1 July 1858 meeting of the Linnean Society while Wallace was on the other side of the world collecting beetles, birds, and other animals for British collectors (Clements 1983).

Wallace never showed any envy or ill feelings for Darwin's priority in establishing the principal mechanism in understanding how species change through natural selection (Brackman 1980). Wallace became active in publishing some of the most clear and lucid arguments for the theory of evolution (Wallace 1889). He was one of the preeminent scientists of his day. His books on his explorations and collections from the Amazon rain forest and his adventures among the islands of the South Pacific Malay region brought him acclaim from both popular readers and scientific peers. He published hundreds of scientific articles and books, many of which are considered landmarks in natural history. Today he is acknowledged as codiscoverer of the theory of evolution through natural selection as well as the father of biogeography, the study of species distribution and patterns.

Wallace was never one to temper his opinions or engage in periphrasis to avoid the harsh judgment of his peers, and he boldly took up some unpopular causes, such as nationalizing land ownership for more equitable land distribution among all classes of society. He was an active socialist and antimilitarist and was avidly concerned with the health and welfare of the poor. Such causes tended to distance him from the landed gentry, from whom most of the scientists, such as Darwin, came. One of the most peccant ideas that Wallace embraced was that of spiritualism.

In the late 1800s, spiritualism was sweeping both England and America. Seances, Ouija boards, fortune telling, consulting with spirits of the departed, and searching for criminals by using divining rods were all part of the mainstream cultural currency. The existence of fairies was discussed, explored, and espoused by all segments of society; the bizarre and paranormal were embraced widely in the middle and upper classes. In darkened rooms, participants gathered to hear otherworldly beings knock mysteriously, speak through one of those assembled, or raise the table around which the curious had gathered. Sometimes strange objects or even people could be seen floating without support through the air.

Wallace was introduced to spiritualism through its connection with hypnotism (or mesmerism, as it was called) and phrenology, which he began to dabble in when he was a young man working as a teacher. As he became more scientifically mature, he began to disparage the reluctance with which many of the scientific elite embraced new ideas, for example, his and Darwin's theory of evolution.

His interest in spiritualism first flowered during his travels in the Malay Archipelago and extended as spiritualism swept the Americas and Britain. At first, he was quite cynical and approached the matter with skepticism and doubt. However, the more he looked and the more often he experienced the claims being made by the spiritualism practitioners directly, the more convinced he became:

I was so thorough and confirmed a materialist that I could not at that time find a place in my mind for the conception of spiritual existence, or for any other agencies in the universe than matter and force. Facts, however, are stubborn things. My curiosity was at first excited by some slight but inexplicable phenomena occurring in a friend's family, and my desire for knowledge and love of truth forced me to continue the inquiry. The facts became more and more assured, more and more varied, more and more removed from anything that modern science taught or modern philosophy speculated on. The facts beat me. They compelled me to accept them *as facts* long before I could accept the spiritual explanation of them; there was at that time "no place in my fabric of thought into which it could be fitted." By slow degrees a place was made; but it was made, not by any preconceived or theoretical opinions, but by the continuous action of fact after fact, which could not be got rid of in any other way. (Wallace [1874] 1896, preface to 1st ed., vii)

Wallace, to the embarrassment of his associates in science, including Darwin, became an avid defender of spiritualism. But his defense was as logically rigorous and well documented as his defense of evolution had been. He harnessed the same mind that had independently solved one of the greatest puzzles of the enlightenment—the origin of species—to investigate and substantiate spiritualism. It is intriguing to follow his defense.

In *Miracles and Modern Spiritualism* ([1874] 1896) he begins by castigating David Hume and other philosophers and scientists for dismissing miracles without exploring the facts themselves, stating that "few if any

have thoroughly and honestly investigated the nature and amount of the evidence that those events really happened” (p. 38). He then gives an impressive list of miracles attested by multiple credible witnesses, including learned men of science (no women are mentioned) such as Augustus De Morgen and Robert Hare; prominent physicians of the day; clergymen; and authors such as William Thackeray and Anthony Trollope. After defending miracles, animal magnetism, and clairvoyance, he turns to spiritualism. To Wallace, spiritualism was not part of a larger belief in an organized religion or even in the existence of God. The activities he witnessed implied only that “intelligent beings may exist around and among us, unperceived during our whole lives, and yet capable under certain conditions of making their presence known by acting on matter” ([1874] 1896, 43). So spiritualism was another scientific phenomenon to be investigated using the best tools of his discipline: observation, hypothesis generation, hypothesis testing, and inference. His first observation of spiritualist phenomena had a profound effect on him:

It was in the summer of 1865 that I first witnessed any of the phenomena of what is called Spiritualism, in the house of a friend—a sceptic, a man of science, and a lawyer, with none but members of his own family present. . . . [I] sat with my friend, his wife, and two daughters, at a large loo table, by daylight. In about half-an-hour some faint motions were perceived, and some faint taps heard. They gradually increased; the taps became very distinct, and the table moved considerably, obliging us to all shift our chairs. Then a curious vibratory motion of the table commenced, almost like the shivering of a living animal. I could feel it up to my elbows. These phenomena were variously repeated for two hours. On trying afterwards, we found the table could not be voluntarily moved in the same manner without a great exertion of force, and we could discover no possible way of producing the taps when our hands were upon the table. ([1874] 1896, 132)

Observation was not enough for the skeptical Wallace. He continued his investigation by conducting scientific experiments on the phenomena:

On other occasions we tried the experiment of each person in succession leaving the table, and found that the phenomena continued the same as before, both taps and table movement. Once I requested one after another to leave the table; the phenomena continued, but as the number of sitters diminished with decreasing vigor, and just after the last person had drawn back leaving me alone at the table, there were two dull taps or blows, as with a fist on the pillar or foot of the table, the vibration of which I could feel as well as hear. No one present but myself could have made these, and I certainly did not make them. (p. 133)

He continued to analyze the curvature and direction of the table movement and the inability to duplicate the sound of the taps by various methods and objects, and to form and reject explanations other than the presence of otherworldly beings. He was convinced not because he wanted to believe or because he found meaning in what he believed but because he could find no other explanation for the facts at hand. As he continued to describe what led him to this belief, we find him examining tables, chairs,

and other objects that had levitated, started vibrating, or behaved in some anomalous fashion, looking for strings or other sources of deception. He looked under floating tables in a brightly lit room trying to understand what was happening and was compelled by his observations to believe in intelligences, on a spectral plane not our own, as the only rational explanation for what he saw.

So here we have a profound intellect, using the best analytic methods of his day, saying he could not reject the hypotheses of spirits who spent their time moving tables and tapping simply for the benefit of people assembled to experience such things.

What do we do with Wallace? This is a question his contemporaries also asked themselves. What do we do with a scientist who believes in spiritualism and claims it is science that brought him to this belief? Wallace's claim in the book is a strong one. It is well documented with numerous examples, observations, and experiments. If the book had been written about evolution or biogeography, it would have been heralded as some of the finest thinking of the nineteenth century. But no—it was about spiritualism, and the galling thing is that he used the same methods to explore this topic as he did to explore evolution. Few scientists today have ever heard of Wallace's book on spiritualism, let alone read it. Most of the evolution texts that mention Wallace focus on his contribution to the study of evolution, but his later life turned out to be a scientific embarrassment and is swept under the rug.

Why do we believe Wallace when he writes about evolution yet ignore him when he turns to spiritualism? Part of the reason is the context in which we receive his writings today. Spiritualism is now out of fashion, hoaxes have been exposed, and there is no longer a social context for the idea of spiritualism. The experiments, while repeatable in Wallace's day, are no longer repeatable, and thus they fail one of the hallmarks of the scientific method. But they *were* repeatable then! When one reads Wallace's works, one is struck by how he acted with complete warrant in exploring spiritualism scientifically. As Kuhn has demonstrated, Wallace was operating under the social constructs of his day.

Perhaps his belief in spiritualism can be explained, in part, by his being actively deceived. Charlatans were manipulating the data, something one would not expect from data gathered from the natural world. For example, Charles Williams, a well-known medium who had performed seances in the presence of Darwin and the writer George Eliot, was exposed by George Romanes as a fake (Browne 2002). Wallace was a trusting individual who took at face value those he supposed were other seekers of the truth. The scientific method cannot work in an environment where the objects of experiment are being manipulated dishonestly. But Wallace knew this and was looking for ways he could have been deceived. He just could not find them.



Scientific materialists point out that Wallace's metaphysics made him vulnerable to the misapplication of science. Under materialist metaphysics Wallace would not have asked the question about unobservable entities peopling the universe. Darwin, the quintessential materialist, did not lose his focus on such "distasteful" subjects and is universally revered as evolutionary theory's founding father. Conversely, Wallace is nearly forgotten and drifts in and out of obscurity as a scientific oddball. But what is important here is that metaphysics matters. While materialists might think that this is a vindication of their worldview, it more appropriately shows that worldview cannot be divorced from science. Wallace's study of spiritualism demonstrates that science as a method is at the mercy of its assumptions. Wallace failed to discover an objective reality not because his science was poor but because his metaphysical assumptions were flawed.

What are the effects of the materialists' own metaphysics? B. Alan Wallace (2000) has pointed out that two fundamental assumptions of the materialist agenda—that only the physical world exists and that science will uncover all truths about this world—are empirically unknowable and assumed without reflection or questioning. Since Alfred Russel Wallace's time, the materialist program is the *de facto* worldview that shapes science today. Materialists' metaphysical assumptions are not questioned and have become the central dogma for scientific investigations. It is becoming clear, however, that this religious zeal for materialism has its own dangers. What is being lost by the unrecognized materialist assumptions? Can we take the materialist assumptions and unreflexively go on our way because we have seen major successes in the world of science? Can we dismiss, as they do, any possible influence of factors from nontypical physical sources? Is the idea of God soon to follow the knocking ghosts of Wallace's day under scientific materialism's relentless onslaught, or are materialists ignoring aspects of reality not available under their methodology and agenda? If you assume that the universe contains only *x*, when it in fact contains both *x* and *y*, then, like Wallace, your metaphysical assumptions are going to trip you. Even if *y* is not needed at the level of most scientific investigations (in the same way that Newtonian physics works quite well despite its nescience of relativity or quantum mechanics), at some level aspects of reality are being missed if one assumes only *x*.

#### EVOLUTION'S ROLE IN STRUCTURING BELIEF: SCIENCE AND RELIGION

*Kierkegaard and Popper—Science as an Approximation.* Søren Kierkegaard wrote that our picture of an objective reality is always only an approximation: we can get nearer and nearer to lining up our inner model of the universe with some objective reality, but it is always a model (Kierkegaard 1846). Today we have a better understanding of the way that a



model of reality works within the brain, and we know how our individual model of reality is constructed from a combination of sensory input and neural architecture. I argue that it is a quite good model. It contains enough accuracy to navigate through an objective reality with some sense of continuation and meaning. From an evolutionary perspective the model must at least be good enough at this navigation to survive. Assuming that George Berkeley's strong idealism is incorrect, organisms that ignore this objective reality (whatever its form) do not survive long. For example, simple rules like "Do not jump off high cliffs" or "Run when being chased by a saber-toothed tiger" are handy ways to use this correspondence between inner map and outer reality. Having good models is essential to an organism's survival. For example, for a plant, moving toward the light is a good way to connect the inner map with the objective reality. One school of thought contends that an objective reality is always unknowable. Perhaps in some ultimate sense this is true, but we need to know enough about this hidden reality to survive. That our species is still here suggests that our map is at least correct in a few particulars. Natural selection is a good screen for filtering useful inner maps of an underlying objective reality from nonuseful maps.

*Science as a Wrightian Adaptive Landscape.* Sewall Wright (1978) proposed that the process of evolution could be viewed as an adaptive landscape. Though its particulars have been challenged, this has been a fruitful model for understanding evolution, speciation, and rates and modes of evolution. For example, if we plot two dimensions of gene combinations on the  $x$  and  $y$  axes of a Cartesian coordinate system, and on the third dimension ( $z$ ) plot fitness levels, we get a hilly landscape where the hills represent increased fitness and the valleys represent places of decreased fitness. A population of a given species will move up the landscape to a local peak through natural selection. When the population reaches a peak, it is stuck there until the environment changes or new mutations send it to a new peak (most of the literature on adaptive topologies is concerned with getting off these local peaks to more global maximums). It is a challenging problem that may require that the metaphor itself be scrapped and more elaborate adaptive landscapes be considered (Gavrilets 1999).

Wright's adaptive landscapes do provide, however, an interesting metaphor for the philosophy of science, in line with that of others, such as David Hull (1988), who consider science itself an evolutionary process. Karl Popper's ideas of science, such as the notion that science proceeds by rejecting null hypotheses, may be viewed as a selection process, in which finding increasingly fit hypotheses to explain given phenomena is the goal. The fitness function can be thought of as the hypothesis' success in matching its explanatory power with some underlying reality, so that science

itself is under a process similar to natural selection. Science, in this metaphor, climbs this fitness function defined by the distance between its description of reality and the underlying (and always unavailable) universe.

But what does this adaptive landscape of scientific theories look like? Is there an analogy to the rugged adaptive landscapes seen in biological systems? Because of their complexity, the landscapes found in biological systems seem to display what is known as correlated ruggedness. The landscape is covered with numerous peaks and valleys, almost like a fakir's bed of nails. If science itself can be seen to be moving over an even more complex adaptive landscape—again, its fitness function defined by its closeness to some underlying reality—then we may expect that the same problems that occur in biological systems occur with science: getting stuck on local peaks and missing global optimums. (The idea that valleys may be myths and peaks more scientific explanations of cause and effect may offer some connection to postmodern deconstruction literary theory, in which our science grows out of particular myths or worldviews.) The analogy is not perfect, but it is interesting to speculate that science might not be able to escape these local maximums, which in turn would cause us to miss “greater” truths, defined by models with an even closer match to the global reality. Following a conjecture that Gödel's proof<sup>1</sup> applies to science (Chalmers 1996, 139) (assuming that the scientific method can be mapped to some system of predicate logic) would suggest that there are scientific truths (or theorems) that cannot be proven within science. Scientific materialism can never find even all scientific truths!

Science is an imperfect mechanism for discovering truth. It is powerful in the same sense that evolution is powerful, that is, the most well-adapted theories are those that are most useful in describing the universe. Science is nonetheless imperfect in that it may tend to get stuck at local fitness peaks, suggesting that some scientific truths may never be reached by science.

So what other sources of truth are available to us? Is religion one? Gould (1999) argues that religion can only offer relational ethical advice—tied not to some ultimate truth but to convention—and provides an allowable system with which to frame these ethical rules. I am not comfortable with that role for my personal faith. If it is not grounded in some universal truths, such as that a being exists that loves and is concerned about me, I'd rather scrap the whole thing and join the materialists and embrace whatever ethical system *is* based in truth (granted that deep reality may still be ultimately unknowable, even from my religious perspective). So, given the limits of science, the question arises, Has materialism dealt a death blow to religion? Does Mount Improbable's gentle slope obliterate the idea of a personally approachable god?

*Simulation and Evolutionary Ecology: Hidden Purpose, Masked Design.* It has been argued that our existence, indeed all of Earth's biota, is the

result of randomness and contingency. Gould (1990) and others have argued that, were the clock of Earth's history rewound back to the Precambrian, with different outcomes from chance events we might have an entirely different set of life forms on the planet today. They argue that our existence as the human species has been contingent on thousands of small random events that have changed the course of evolution. That may be so, but these are not scientific statements. They are not testable. It is strange how quickly talk about ultimate origins seems to abandon science, all in the name of science. For example, to explain away the anthropomorphic principle that the universe seems perfectly designed for carbon-based life forms, skeptics posit infinite universes. We happened to evolve in one that supported carbon-based life. This is an intriguing possibility but certainly not a scientific hypothesis, because it is not testable. It is another just-so story of possible explanations of origins, as is the anthropomorphic principle. For different reasons both are accepted or postulated as articles of faith.

Dennett (1996) and Dawkins (1996) have both argued that chance and contingency point to an ultimately purposeless and meaningless universe. My perspective as an evolutionary theorist suggests a different possibility. In my research, I explore adaptive landscapes to understand how evolution happens (Peck, Ellner, and Gould 1998; 2000). In my models, evolution is represented by rugged landscapes, much like a mountain range with scattered high peaks and low valleys. Each rise in elevation represents an increase in the average fitness of the population. A population on the landscape is driven uphill by selection. Dawkins has done an excellent job of describing these landscapes in *Climbing Mount Improbable* (1996). It is a blind process in which a rich diversity of computer entities can be developed by climbing these adaptive landscapes. He claims that this is proof against religion and that blind processes can lead to amazing complexity with Darwinian processes only. I agree, except on one point: in every artificial example Dawkins uses, someone has set up the landscape.

In Dawkins's computer simulations, as in mine, there is always a landscape that defines which outcomes are possible and even which ones are likely. In my own simulations, I have observed that once I set up the landscape there are random, yet inevitable, events that I know will occur with a given probability. In my simulations, in the "Mount Improbable" that my computer creatures climb, some peaks are higher than others. Once one climbs a hill it is difficult to go back down, but there is a finite probability that the creatures will escape these local peaks. Somewhere in the landscape is a peak that is higher than any other. However, given certain search algorithms and only Darwinian rules for reaching the peak, if I let the simulation run long enough and under specified conditions, reaching the highest peak is inevitable. Although the process is stochastic, it is a function of the underlying search algorithm. The time until the highest

peak is reached is a random variable, and it may take a long time, but reaching it at some time happens with a probability equal to one.

Consider a population of organisms living on my adaptive landscape. To those creatures on the surface it would appear that reaching that peak occurred entirely through random processes. The algorithm would be invisible to the inhabitants of my landscape. Like the materialists, they would proclaim that they live in a random universe where chance and contingency rule. If they were wise, however, they might ask, "Who placed the adaptive peaks and valleys there?" "They just exist," claim the materialist creatures on my landscape. They do not need the "giant programmer in the sky" hypothesis to explain it. It just exists, and reaching the highest peak was just a matter of chance and evolution. They could postulate (given the ruggedness of the landscape) that any number of peaks could have been reached and that there was no reason that this particular one should be the one they ended on. Yet, the members of that population sitting on my landscape speculating that all was unpredictable because it was random would be wrong. I had set it up from the beginning to reach that particular peak. It did not require my intervention in the process. I just let it run its course, and although I could not have guessed the exact time the peak would be reached, I could calculate an expected time and variance and get a pretty good idea when it would occur.

Dawkins uses similar devices in his *Climbing Mount Improbable* to argue for a random universe, but in every example he gives, he has set up a mountain to climb, just as I have. These mountains are the "laws" of the universe.

Where do the mountains or laws come from in our universe? For example, there is a large consensus that it is likely that life in the universe is common. Given the billions of galaxies it seems that a system like ours is bound to exist elsewhere. Is our universe constructed in such a way that certain mountains will inevitably be climbed? Is the design of the universe such that intelligent life is an eventual given? Is our evolution an inevitable outcome of the way the universe is constructed? We cannot answer these questions from inside this system. So, postulating multiple universes or ones driven by mindless randomness is even less subject to experimentation than Wallace's wall-knocking, table-lifting spirits.

Today, great strides are being made in understanding how evolution structured the biodiversity of our planet. Because I believe that life evolved according to the rules and laws of our universe, I can join the effort to understand how evolution proceeds with the same scientific methods and procedures as my colleagues use. However, I also believe that science is not the only way to obtain truth. Science is not ultimate. Its greatest failures come in the area of understanding subjectivity.

## SCIENCE AND SUBJECTIVITY

*Subjectivity as a Way of Knowing.* Kierkegaard recognized that how we experience this underlying map subjectively is all that really matters to the individual. “Subjectivity is truth,” he argued (1846, 187). This raises the questions, Are there subjective truths? Are there truths available only subjectively? If so, what is the nature of these truths, and are they amenable to some sort of subjective scientific method?

Of course there are subjective truths, or at least there is one subjective truth. René Descartes identified it long ago with *cogito ergo sum*, I think, therefore I am. We are aware of our own consciousness, and in fact it is the only one to which we have access. Some have dismissed consciousness as an illusion (Dennett 1992). Others have postulated a dualist position that the mind and brain are separate things (Popper and Eccles 1977; Chalmers 1996). Some suggest that explaining consciousness is beyond the power of the human mind (McGinn 1999; Levine 2001). Despite a plethora of ideas, consciousness remains a mystery (notwithstanding such provocative titles as Dennett’s *Consciousness Explained* [1992]). It has been called an emergent property or supervenience (Clayton 2000), but these terms convey little about causal mechanisms. Something happens, but no one is sure what specific factors in the brain bring consciousness about or how it arises.

*Subjective Truths.* Kierkegaard chides speculative philosophers, such as Hegel, because their theories and systems are not grounded in a subjective matrix:

If a dancer could leap very high, we would admire him. But if he tried to give the impression that he could fly, let laughter single him out for suitable punishment; even though it might be true that he could leap as high as any dancer ever had done. Leaping is the accomplishment of a being essentially earthly, one who respects the earth’s gravitational force, since the leaping is only momentary. But flying carries a suggestion of being emancipated from telluric conditions, a privilege reserved for winged creatures, and perhaps also shared by the inhabitants of the moon—and there perhaps the System will first find its true readers. (Kierkegaard 1846, 112–13)

We might so accuse hard-line materialists who similarly suggest that there is no consciousness and that it is all an illusion. (Whose, I wonder, if no one’s there?) My subjective consciousness is my only reality. Kierkegaard posited that objective scientific or historical certainty can only be approximated. It might get closer and closer to a presupposed objective reality, but there would always be incomplete facts, impossible observations, and other omissions that would prohibit a complete description of the phenomenon. Therefore, our subjective grasp of certainty could never reach beyond approximation.

Kierkegaard points out that certainty is an illusion as long as it is based on observations or knowledge outside the one subjective truth that we can be certain about: our own existence. To Kierkegaard, this was the only truth that mattered, hence the title of the section of the *Concluding Unscientific Postscript*: “Subjectivity Is Truth.” He goes on to define truth: “An objective uncertainty held fast in an appropriation-process of the most passionate inwardness is the truth” (Kierkegaard 1846, 182). Truth is not something floating out there in the universe; truth is a condition of existence that can be appropriated only within the subjective capabilities of the individual.

This idea that all our knowledge really derives from personal subjectivity is developed further by B. Alan Wallace:

When encountering a scientist’s findings—even if we are scientists—most of us don’t know that her empirical data are sound, rather we tend to take them on faith. Otherwise, the only way to know they are sound is to create a comparable laboratory of our own (we can’t use hers, or if the data can be replicated only in hers and in no other laboratory, they are suspect), replicate the experiment, and see whether our findings corroborate hers. Likewise, we don’t know that the mathematical analysis of her data is sound unless we apply our own analysis and thereby confirm her results. Likewise, we don’t know that her theoretical interpretation of the quantitative results is sound unless we apply our own knowledge of the theory to corroborate hers. In other words, her findings—which on the surface seem to be public and third-person—are *known* by us to be valid if and only if we pursue the same research ourselves. That is, all “third-person” or collaborative research really consists of multiple first persons doing their own research and trusting the work of their collaborators. (2000, 184)

So, faith is not merely an attribute of religious praxis; it is a necessary ingredient for moving science forward. We trust that the assumptions, experiments, analyses, and conclusions of our colleagues are accurate and are done in the same way we would do them if we were doing the experiments. This process describes Karl Popper’s “World 3,” the accumulation of knowledge, represented by the papers, books, and other forms of discourse done according to appropriate procedures dictated by the scientific method (Popper 1985).

Faith, then, is an element of all subjective acquisition of knowledge. To Kierkegaard, faith and truth are inseparable:

The truth is precisely the venture which chooses an objective uncertainty with the passion of the infinite. I contemplate the order of nature in the hope of finding God, and I see omnipotence and wisdom; but I also see much else that disturbs my mind and excites anxiety. The sum of all this is an objective uncertainty. But it is for this very reason that the inwardness becomes as intense as it is, for it embraces this objective uncertainty with the entire passion of the infinite. In the case of a mathematical proposition the objectivity is given, but for this reason the truth of such a proposition is also an indifferent truth.

But the above definition of truth is an equivalent expression for faith. Without risk there is not faith. Faith is precisely the contradiction between the infinite passion of the individual’s inwardness and the objective uncertainty. (1846, 182)

Here is expressed Kierkegaard's famous "leap." Faith begins with a recognition that there exists uncertainty of any knowledge (except mathematical, which has no existential value, Kierkegaard posits). Deciding that something is true always involves a certain level of uncertainty.

This is where scientific materialism fails. By denying a subjective component to the appropriation of truth, and by not recognizing the role of faith in the appropriation of truth, the materialist outlook is philosophically flawed—reminiscent of Kierkegaard's dancers described earlier. The assumptions, as summarized by Wallace, are: (1) "The physical world is the only reality" and (2) "the universe originates wholly from impersonal natural forces; it is devoid of any intrinsic moral order or values" (2000, 161). These assumptions are all accepted without question or reflection, when in fact there exist no empirical observations that support or verify these assertions. Because materialists are blind to the form of dogmatism that they have embraced, they are left denying the most fundamental existential truth we can appropriate: our own subjectivity.

*The Nature of Subjective Truths.* I do not mean to suggest that there is no difference between objective and subjective truths. Objective truths, the kind we seek through the scientific method, are those that we suppose would be discovered by anyone using the same instruments, methods, and analysis that we have used. In doing science we detail what we did to perform the experiment—in essence, giving a recipe for what we hope guides others in a repeatable sequence of actions that lead to the same data that we obtained. These are what we call objective truths, despite, as I have pointed out, their ultimately subjective nature. These are truths that we hope map an objective reality—one that would exist whether we were here or not.

Nevertheless, are there purely subjective truths available only to the individual? My experience of subjectivity is forever unavailable to any other existing individual: the fundamental me that experiences life's rich qualia, the person framed by my quantitative mental states, the combination of processes that combine to make up that entity is unique and individually mine. That at least is a subjective truth that is singularly available to me alone.

If there is one such truth, are there others? Are there subjective truths that have no counterpart in the objective world but may be a part of a world hidden from the objective world? What would be the nature of such subjective truths? One point must be made here: the subjective truths I am looking for are universal truths available only subjectively—not some sort of personal truth, or something that is true just for me, but rather universal truths that explore a universe hidden from the measurable universe with which science seeks to grapple.



My faith in God is what I believe to be one such subjective universal truth. When I pray, when I am reading and pondering the scriptures, I feel God's presence subjectively. How I experience and interact with this subjective experience is ineffable, personal, and real. Just as when I experience the color red while looking at the fire hydrant outside my window, my subjective experience with God is vibrant and undeniable within the context of my mind when it is experienced. This subjective experience convinces me that there is a God. This does not mean I am unaware that my mind might be sending me signals generated from within my brain alone, but just as I reject idealism because the preponderance of evidence seems to me to support an independent objective world, my subjective experience with God suggests that something outside of myself is causing the perception of a relationship with God. I do recognize the possibility that these feelings and sensations could be nothing more than an evolved strategy for coping with a big brain, perhaps necessary for the higher level of cognitive power human beings enjoy.<sup>2</sup> I find it harder to believe that God is not there than that God exists.

Still, how do we weigh subjective experience? Is there a science of subjectivity? I think there is. I remember hearing of an interview with an atheist scientist (I have forgotten the name of this scientist) who claimed that you might as well believe that there is a teapot circling the planet Pluto as believe that there is a god interacting with the affairs of the universe. Both are outside of science's ability to detect. One can posit any such nonevidential nonsense, but clearly the burden of proof lies with the proposer, and thus far there has been little evidence to support the god hypotheses. Perhaps.

The teapot analogy shows some of the problems of getting behind subjective truths—assuming they exist. For example, what if the teapot speaks to me? Of course, such a claim would be taken as nothing more than madness, but if I offer a formula by which anyone can speak to the teapot, "Do the following: stand on your head, blink three times, and say didy-didy-da-da," and when people follow my recipe the teapot speaks to them, then there is some supporting evidence for . . . what? Only one thing—I am not alone in my madness. Myriad things could be going on: a teapot that circles Pluto that actually talks to people, or a repeatable brain malfunction caused by too much blood rushing to the head of an upside-down person chanting nonsense, or a maniacal government experiment located in a deep silo in northern Colorado that monitors brain wave activity and sends messages that the brain can pick up when it detects the formula being followed. The second and third are at least susceptible to scientific tests, but the hypothesis about the teapot is again untestable. Suppose then that our exhaustive search for alternative explanations falls short. At what point do we begin to accept the hypothesis that there is a talking teapot? As the number of people who try the subjective experi-

ment continues to grow (all agreeing that when you follow the recipe the teapot speaks to you) can you ever accept that there is a talking teapot? Do we apply Sherlock Holmes's famous dictum—When you have eliminated the impossible, whatever remains must be the truth, no matter how improbable—and assume that there is indeed a talking teapot? It seems that no matter how many people subjectively experience a talking teapot, without additional warrant we cannot accept that a talking teapot orbits Pluto, because it does not fit in with what we know about the rest of the universe. We need something else. We need that warrant. The only place we have seen consciousness before is in complex biological beings. Teapots are not complex enough to be talking with us. Therefore, despite the number of reported cases of a talking teapot, we cannot accept it as true. It makes no sense in light of the other facts we know about the universe.

Suppose the teapot itself supplies that warrant. Does that change things? Suppose it tells those receiving the messages that it was once an ordinary teapot until one day a group of aliens abducted it from Earth and filled it with advanced neurotechnology that gave it senescence. Then they equipped it with a transmitter of a new and unknown technology, allowing it to communicate with biological brains, and set it circling Pluto. While still farfetched, this does seem to place the claim of a teapot communicating to earthling brains in the realm of objects and processes that could conceivably exist in the universe.

A subjective truth, then, has to fit into what we have learned about the objective nature of the universe. Subjective truths should not contradict objective truths. Still, if there are subjective truths, then they lie completely outside the scientific method. Yet, again, the fact that consciousness exists demonstrates that there is at least one subjective truth that seems irrefutable—our own consciousness. That, at least, for each individual is undeniable (except for those hard-line materialists who *have* managed to deny its existence), and yet ever unavailable to the thousands of other individual consciousnesses that surround it. What I experience as my relationship with God is ever outside of your purview. You can never know what I feel as a conscious being. You may check my brain states while I claim to be experiencing God. You may correlate behavioral responses to my claims of experiences with God. Yet the qualia of God are experienced only at the subjective level. From such subjective experiments as prayer, feeling after God, and letting God guide my life, I have gathered subjective evidence that God is there and individually interested in me. While it is impossible for you to experience the things that contribute to my belief (try to describe, using words, the taste of a lemon to someone who has never experienced something sour), I can recommend the process to you and see if you come to the same conclusion. So, faith is not a matter of belief despite evidence or lack of evidence; faith is the subjective experiment of coming to find nonscientifically available subjective truths. Just as we suspect that

others have consciousness despite the complete lack of any objective measure, we may assume that subjective truths are universal but can only be appropriated by the individual. Objectively they are invisible, like other people's individual consciousness.

### CONCLUSION

I am not convinced that materialists hold the intellectual high ground in their dismissing religion. I have found great value in the methods of science in exploring the visible universe. Once we move beyond my belief in God, and the materialists' rejection thereof, we find that our practice of science is the same. We publish in the same journals, speak at the same conferences, and read the same books. In the realm of the subjective experience of the universe, however, we disagree profoundly.

### NOTES

Thanks to Steven R. Hawks, Don Norton, and an anonymous reviewer for their help in improving this essay.

1. Gödel's theorem proved that within any axiomatic system in mathematics there are true theorems that cannot be proved within that system.

2. There has been much talk of the possibility of there being a God module in the brain (Albright 2000; Newberg, d'Aquili, and Raue 2001; Spezio 2001). Its existence or nonexistence is irrelevant to the question of God's existence. Most of the evolved structures of our brain are used to process outside signals such as light, sound, and olfactory chemicals. If part of my brain is used to experience God, whether it is processing real signals or not is still an open question.

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