6-22-2007

Whose Science and whose Religion? Reflections on the Relations between Scientific and Religious Worldviews

Stuart Glennan
Butler University, sglennan@butler.edu

The original publication appeared at:
Glennan, Stuart. Whose Science and Whose Religion? Reflections on the Relations between Scientific and Religious Worldviews. *Science & Education*. Published online on 22 June 2007 at
http://www.springerlink.com/content/qq25743x523n5056/?p=5bfee6470b404a76a57891b63a0592fb&pi=12

DOI: 10.1007/s11191-007-9097-3

Whose Science and whose Religion? Reflections on the Relations between Scientific and Religious Worldviews[1]

STUART GLENNAN

Department of Philosophy & Religion
Butler University
Indianapolis, IN

Abstract

Arguments about the relationship between science and religion often proceed by identifying a set of essential characteristics of scientific and religious worldviews and arguing on the basis of these characteristics for claims about a relationship of conflict or compatibility between them. Such a strategy is doomed to failure because science, to some extent, and religion, to a much larger extent, are cultural phenomena that are too diverse in their expressions to be characterized in terms of a unified worldview.
In this paper I follow a different strategy. Having offered a loose characterization of the nature of science, I pose five questions about specific areas where religious and scientific worldviews may conflict – questions about the nature of faith, the belief in a God or Gods, the authority of sacred texts, the relationship between scientific and religious conceptions of the mind/soul, and the relationship between scientific and religious understandings of moral behavior. My review of these questions will show that they cannot be answered unequivocally because there is no agreement amongst religious believers as to the meaning of important religious concepts. Thus, whether scientific and religious worldviews conflict depends essentially upon whose science and whose religion one is considering. In closing, I consider the implications of this conundrum for science education.

1 Introduction

Towards the end of his life, in 1932, Sigmund Freud delivered a lecture entitled "On the Question of a Weltanschauung" in which he argued passionately for the ascendancy of the scientific over the religious Weltanschauung (worldview). Freud characterizes a Weltanschauung as

> an intellectual construction which solves all the problems of our existence uniformly on the basis of one overriding hypothesis, which, accordingly, leaves no question unanswered and in which everything that interests us finds its fixed place (Freud 1965, p. 158)

Freud believed that the powerful appeal of religion is that it provides human beings with such a comprehensive Weltanschauung. But he believed that the religious Weltanschauung, for all its psychological appeal, was an illusion. In its place Freud put forward a scientific Weltanschauung that contained his own psychoanalysis as a part. The scientific Weltanschauung differs from the religious Weltanschauung because it does not provide the full range of answers that a religious Weltanschauung would:

> The *Weltanschauung* of science already departs noticeably our definition. It is true that it too assumes the *uniformity* of the explanation of the universe; but it does so only as a program, the fulfillment of which is relegated to the future. … It asserts that there are no sources of knowledge of the universe other than the intellectual working-over of carefully scrutinized observations … and alongside of it no knowledge derived from revelation, intuition or divination (*ibid*., pp. 158-159).

While Freud was hardly the first to argue for the incompatibility of scientific and religious worldviews, his place in the history of the dispute over the relation between science and religion is of singular importance because Freud, using the techniques of psychoanalysis, sought to provide naturalistic explanations of religious experience and behavior.

The details of Freud's arguments for the incompatibility of scientific and religious worldviews need not concern us here. What is important, for my purposes, is to observe Freud's general strategy for establishing his claim. The way that Freud cast the conflict presupposed that religion, as such, has a single characteristic Weltanschauung, while science, as such, has a second, incompatible one. There was, he thought, some essential character of science, what science educators have subsequently come to call the nature of science (or NOS), and there was, on the other hand, some essential character of religion, which we might call the nature of religion (NOR). Freud believed that by examining NOS and NOR, he could demonstrate that science and religion had essentially incompatible Weltanschauungen.

Freud's strategy has frequently been adopted by those who believe that science and religion are incompatible. Mahner and Bunge (1996a) pursued this strategy quite explicitly in the pages of this journal, and it has also been used in widely discussed books by Dennett (2006) and Dawkins (2006). By changing claims about NOS and NOR, the strategy can equally well be used by those arguing for the compatibility of religion and science. Polkinghorn, for instance, begins his compatibilist argument with chapters entitled "The Nature of Science" and "The Nature of Theology" (1986). Compatibilists and incompatibilists come to such different conclusions about the relation between science and religion simply because they offer such different accounts of what science and religion are, or should be. Lacey (1996) for instance, argues against Mahner and Bunge's incompatibilism by arguing that they got both NOS and NOR wrong.

This mode of argument is ultimately fruitless, because it begins from the false presupposition that science and religion have definable natures. Science, to some extent, and religion, to a great extent, are simply too diffuse as cultural phenomena to be said to have a *nature*. The way to move the discussion of the relationship between scientific and religious worldviews forward is to divide the question. While we cannot ask whether science and religion writ large are compatible or incompatible, independent or engaged, and so on, we can ask more specific questions about the relationship between various scientific and religious presuppositions, beliefs, theories and practices.

My strategy in this paper will be to examine a five such questions that have proved to be particularly important in recent debates:

1. Is a reliance on faith inconsistent with scientific commitments to evidence?
2. Is a belief in a God or Gods contrary to a scientific commitment to naturalism?

3. Does a commitment to the truth and importance of sacred texts violate scientific canons of evidence?

4. Do developments in science – particular those in psychology and neuroscience – threaten to undermine religious doctrines about freedom of the will and the divine nature of the soul.

5. Do scientific explanations of the origins of moral behavior undermine the moral teachings of religions?

These by no means exhaust the questions one might ask, but they do give some sense of what I mean by dividing the question. None of these questions admit of simple answers, because all depend upon the interpretation of contested concepts. Whether faith is inconsistent with commitments to evidence depends upon how one understands faith; whether believing in God is contrary to naturalism depends upon one's idea of God; and so on for each of the other questions. And while, in the end we cannot provide a definitive answer about the relationship between scientific and religious worldviews, we will see some patterns emerge about the kinds of religious worldviews that are compatible with science.

2 Some Preliminaries on the Nature of Science

Despite my skepticism, I am going to assume for purposes of this paper that science does have something like a nature. While I don't want to discount the diversity of science and scientists, the institutional structure of modern science has enforced sufficient uniformity in attitudes, beliefs, and methods among scientists, that it is not a terrible idealization to talk of a NOS. In this journal, Hugh Gauch has made one attempt at characterizing the NOS by describing seven "pillars" of science, which he has gleaned chiefly by a review of documents from the American Association for the Advancement of Science (AAAS). These seven pillars are:

1. The world which science seeks to understand is real ….
2. Science presupposes the world is orderly and comprehensible….
3. Science demands evidence for its conclusions "Sooner or later the validity of scientific claims is settled by referring to observations of phenomena" ….
4. Scientific thinking uses standard and settled logic….
5. Science has limits in its understanding of the world….
6. Science is public, welcoming persons from all cultures….
7. One of science's important ambitions is contributing to a meaningful worldview …. (Gauch forthcoming)

While these claims are hardly enough to give a full characterization of the nature of science, they do distill important features of the AAAS position and the great majority of scientists would likely agree with them. Philosophers of science might be more skeptical about certain of these claims. Notably, they might worry about just what is meant by the realism of the first pillar; they might wonder whether there is anything like a universal set of standards of "scientific logic"; they might wonder whether scientific standards are really independent of culture, and so on. But I shall not worry too much about these questions.

Gauch's pillars do not provide anything like a demarcation line between the sciences and other empirically driven fields of human knowledge. Nor for that matter do they draw a sharp distinction between scientific and common sense empirical knowledge. While there might be some disputes about just how settled the logic is or in what respects the reality referred to in pillar one might have socially constructed elements, most social scientists and historians would accept these pillars as ideals. Thus, for the purposes of

this paper, I shall construe science very broadly to include the social sciences, history, and empirically driven literary and cultural studies. Whatever the differences between the natural sciences and social sciences or the sciences and the humanities may be, empirically driven academic disciplines of all kinds find themselves in a similar position with respect to religion. While the science and religion literature has tended to focus particularly on issues raised by physics and evolutionary biology, analogous issues arise in connection with fields including cognitive science, Biblical archeology, ancient history, and historical linguistics.

Implicit in Gauch's seven pillars, and indeed in much of the writing on the nature of science, is a distinction between the presuppositions and methodology of science on the one hand, and particular scientific theories on the other. Such a distinction is especially important to Gauch because it allows him to formulate his thesis that the basic presuppositions and methodology of science are worldview independent, while the theories scientists develop as the result of their interrogation of nature may indeed have "worldview import." While this distinction has heuristic value, it can also be very misleading. The problem is that methods of observation and standards of reasoning and evidence are deeply entangled with our theoretical knowledge. There is, as many philosophers of science have argued, no pre-theoretic notion of observation; neither is there any theory neutral "logic of induction." These facts need not worry defenders of the scientific enterprise, but they do suggest that we should be wary of evaluating the relationship between scientific and religious worldviews in a way that divorces the methods of science from its fruits.

3 Five Questions

With this preliminary understanding of the nature of science, we turn now to five questions about the relation between religion and science.

3.1 Is a reliance on faith inconsistent with scientific commitments to evidence?

The answer to this question depends upon what one understands faith to be. Some religious people (as well as some secularists) espouse kinds of faith that are incompatible to Gauch's pillars concerning logic and evidence, while others espouse faith positions that are entirely consistent both with the pursuit of science and the state of current scientific knowledge. While there are many different attitudes that have been characterized as faith, I shall describe three influential alternatives: faith as belief with minimal evidence, faith as submission to ecclesiastical or scriptural authority, and faith as expression of ultimate concern.

Perhaps the most common conception of faith is that faith is belief with little or no evidence. A person might say that she believes that God exists as a matter of faith, where she take this belief to be rather like a belief that Uncle Edward exists, except that, unlike Uncle Edward, she's never seen, felt, smelled or talked to God. Faith in this sense is clearly inconsistent with pillars three and four. Scientific (and indeed pre-scientific) canons of logic and evidence demand that we only believe in entities that we can either observe directly or that are theoretical entities, postulated by a well-confirmed theory that identifies the causes of observable phenomena. Science for instance allows us to believe in tigers (because we can see them) and in tiger genes, because these genes play a causal/explanatory role in a well-confirmed theory that explains the characteristics of

tigers. But clearly we don't have evidence for God in the way that we have evidence for either tigers or tiger genes.

The inconsistency of faith of this kind with scientific standards of rationality is twofold. In the first place, the attitude of believing without evidence is inimical to the scientific spirit. It breeds what W.K. Clifford, in his famous essay "The Ethics of Belief" (2001) disparagingly referred to as "credulousness." Moreover, beliefs that individuals take on faith may turn out to contradict specific claims of well-established scientific theories. To take it on faith, for instance, that there is no evolution of species on the earth requires one to reject a large amount of well confirmed science.

A second and related sort of faith involves obedience to authority in matters of belief. Some people construe faith as requiring them to believe things on the basis of the claims either of scriptural or ecclesiastical authority. A person might for instance believe as a matter of faith that the soul survives the body, because this is what the Pope has asserted *ex Cathedra*. Unquestioned obedience to authority in matters epistemological is also inimical to the scientific spirit. Those who embrace science need not reject authority as a ground for belief, but they must be prepared to evaluate when and to what degree authorities are worthy of trust. One can accept the testimony of authorities and eye-witnesses, but only if one pays attention to these individuals' biases, limits and failures as observers. If one's faith in an authority is unconditional, then it reduces to an unjustified belief in the infallibility of that authority, which again violates pillars three and four.

There is a third approach to faith, expressed perhaps most forcefully by the theologian Paul Tillich (1957), in which faith is expression of one's "ultimate concern." True faith in Tillich's view cannot contradict either scientific knowledge or practice,

because it is concerned with an entirely different sphere of reality. It is not concerned with empirical questions about the composition and behavior of the cosmos, the earth or our brains. Neither is it concerned with questions of natural or human history – how the earth was formed or what happened in Jerusalem in 33 C. E. It is concerned instead with the essentially subjective questions of what we should do and what we should care about. What one is ultimately concerned with is not a matter of what one believes; it is a matter of what one believes in: How should one treat people? Where should one put one's efforts? How should one feel about death? These are questions of value and meaning that cannot be decided by appeal to scientific evidence. I shall offer an argument for this claim below when I return to the relationship between scientific studies of human behavior and the moral teachings of religion; for the moment, it is enough to say that if I am correct in asserting that questions of value and meaning are not questions of belief that can be decided by appeal to evidence, then faith in Tillich's sense is entirely consistent with the pillars of science.[2]

3.2 Is a belief in a God or Gods contrary to a scientific commitment to naturalism?

Like the previous question, the answer to this question depends upon the meaning of contested terms. There is no consensus amongst scientists and philosophers as to exactly what naturalism is, and there is no end to the different ideas human beings have had about God. To make sense of this question, then, I shall stake out one interpretation of scientific naturalism, and evaluate its compatibility with several prominent concepts of a God or Gods.

Gauch is typical of many champions of the compatibility of science and religion in seeking to identify a core of scientific presuppositions and practice that is metaphysically neutral with regard to theism, and to distinguish this from scientifically inspired metaphysical or epistemological views that have clear worldview import (cf. Barbour 1997). It is often argued that the basis for this distinction between scientific and metaphysical claims is that the former are susceptible to empirical scrutiny while the latter are not (cf. Settle 1996). It is easy to see the attraction of this strategy for the scientifically minded theist. If questions of science are separate from questions of metaphysics and if theism is a metaphysical position, it simply becomes impossible to use the methods or results of science to argue for or against theism.

Philosophical naturalists reject this argument because naturalists believe that (a) philosophical epistemology is continuous with the empirical methods of the sciences, and, as a result, (b) that metaphysical conclusions should be continuous with the results of scientific inquiry. In the debate between Mahner and Bunge and their critics, there is considerable dispute over whether naturalism is a presupposition of science or a conclusion drawn from scientific investigation. Mahner and Bunge argue that it is a presupposition, because "science would be rendered impossible if scientists were to take any ontological assumptions above and beyond naturalism seriously." (1996b, 190). Gauch, however, rightly points out that at other places they seem to think naturalism is something one can find scientific evidence for (forthcoming).

The root of this confusion lies in the failure on the part of the disputants to distinguish between naturalism as a methodological position and naturalism as a metaphysical position. It is telling that Mahner and Bunge explicitly equate naturalism

with materialism. Materialism (or as it is more widely referred to in contemporary metaphysics, physicalism) clearly is a metaphysical position that suggests that a complete ontology of the world will consist wholly of entities and properties and relations that either reduce to or are at least supervenient upon the entities, properties and relations described by physics. Naturalism as a methodological position certainly does not presuppose such a metaphysics. Many naturalists are materialists (or physicalists), but this is presumably because this is where they think the results of empirical inquiry have taken them – not because they argued that materialism must be true *a priori*. It is also clear that many philosophers think there are sound empirical arguments against physicalism, at least in certain of its forms.[3] In posing the question of whether naturalism is compatible with belief in a God or Gods, one should not identify naturalism with materialism or physicalism but with the methodological naturalism sketched above.

Some people assume, essentially as a matter of definition, that naturalism precludes belief in a God or Gods. Gods, they reason, are supernatural beings, and are thus excluded by definition from the natural world. But given how supernatural beings are often characterized, they cannot typically be excluded *a priori* from nature. How belief in God fares with naturalism will depend upon what kind of being one takes God to be. While there are endless variations, I will focus on three broad conceptions of God that have been and continue to be important for theists. First, there is what can be called the people's God – a God (or perhaps Gods) who is an active agent in the natural world and in human affairs. Second there is the God of the philosophers and theologians – a more abstract God who in some sense creates or sustains the world. Third, there is the

God of the mystics – a God who is found in the subjective experience of the faithful rather than through his or her action in the world.

Presumably the cognitively and culturally "original" conception of a God or Gods is the God I have called the people's God – a being much like us but with superhuman powers. This is the God we see most often in Biblical literature, in classical mythology and in the sacred texts of pretty much every major religious tradition. Beings of these kinds are *agents* in the same sense in which human beings are. They have mental states like ours –beliefs, desires, emotions, and the like. They also have powers to act in the world on the basis of their mental states. In the Exodus narrative, for instance, Yahweh talks with Moses, gets angry at Pharoah, sending plagues, parts seas and so on. Robert McCauley calls Gods of this kind "culturally postulated superhuman (CPS) agents" (McCauley 2000, p. 74). Such a view of God is often criticized by theologians as primitive, but, as McCauley and others have argued, the view is cognitively natural and continues to play a central role in popular religion.

Causal agency is a foundational concept in human cognition about the natural world. From infancy on, humans seek to organize, explain and predict events in their world by positing "other minds" (cf. Gopnik, Meltzoff & Kuhl 1999) Other minds and mental states are not directly observable, but common sense psychological theories about animate objects (like people or dogs) allow humans to explain, predict and control their environment. CPS agents are even less observable than human and animal agents, but positing unseen agents to explain unforeseen events is neither uncommon nor obviously irrational. When we see something unexpected change in our environment – the room is cleaned up or the garbage can is knocked down – we suppose that this change is due to

the action of an unseen agent – Mom or the dog, for instance. It is not far to get from agents we didn't see to agents we can't see.

But once one conceives of Gods as CPS agents, then it is possible to test claims about the existence of these agents in much the same way that one tests claims about the existence of any other theoretical entity. We appropriately choose to believe in the reality of theoretical entities when the theories that posit them are predictive and explanatory. CPS agent theories about the causes of natural or social phenomena thus compete with scientific ones, and what we find is that the development of successful scientific theories crowds out theistic ones. As our scientific knowledge grows, for instance, we find that our meteorological models do a lot better job of explaining and predicting the force of hurricanes than our theories about Poseidon's moods.

The comparative explanatory poverty of CPS agent theories is what in large part leads to the development of philosophical and theological concepts of God. Whiggish histories of the relationship between science and religion often see the move away from supernatural agency views as being a consequence of the scientific revolution and the enlightenment. While there some truth to this view, the reality is that the intellectual elites have, since antiquity, recognized problems with supernatural agent explanations and have accordingly shied away from literalist readings of religious stories of supernatural agency.

Different theological accounts of God have different points of contact with scientific naturalism, but roughly speaking, the more one's God concept has in common with the concept of an ordinary agent, the more likely one is to find incompatibility. On the one extreme, one finds the sort of God posited by Plotinus and other Neoplatonists.

Plotinus' God was what he called "the one" – an ontologically fundamental unity from which all reality was said to emanate. Emanation is a category of ontological dependence that is difficult to explicate except metaphorically, but however it is explicated, it is clear that emanation is not a causal relation between an agent and the world. The one does not have beliefs, desires or a will, and is not in any ordinary sense an actor in the world. One can probably not make sense of a God of this kind if one adopts an empiricist criterion of meaning (e.g. Ayer 1952), but at least scientific theories of causal agency will not be able to compete with theism of this kind.

Theologians and philosophers often seek a middle ground between the rather-like-us CPS agents that one finds in religious narratives and the very abstract ontological conception of God one finds in Neoplatonist and similar traditions. Typical of such views are those that claim that God an omnipotent, omniscient, benevolent creator. Such a view clearly has elements of agency. To say that God is omniscient is to say that God has beliefs (all true); to say he is omnipotent is to say that he has (and uses) the power to act in the world; and to say he is benevolent is to say that he has desires. At the same time, advocates of such a view typically argue that God does not intervene directly in nature in the way that ordinary agents do. Accordingly, conceptions like this have less clear empirical content than traditional CPS agent views and are more immune to empirical testing.

Of particular interest in worldview debates are the concepts of God that are appealed to in natural theology. Natural theology looks to nature for evidence of God's presence – in the existence of design in organisms or in the regularities of natural law, for instance. Natural theology in this sense is really not distinct from natural science at

all, for, just like natural science, it seeks to provide explanatory accounts of natural phenomena by positing theoretical entities with determinate properties. Theodicies, which attempt to reconcile the benevolence of God with the existence of evil, behave similarly. In this case the task is not to seek evidence in the world for the existence of God, but to provide a theory of the relationship between God and the world that shows that various natural and human phenomena (in particular, natural and moral evil) are not inconsistent with the supposition of an agent that is benevolent and omnipotent. I will not comment here on the adequacy of these theories. It is enough to notice that these theories do indeed enter into competition with non-theistic theories of natural and human phenomena. But given the very abstract character of such theories, they are much harder to verify or falsify than CPS-agent theories.

The relationship between popular and theological theories of God is analogous to the relationship between less and more abstract scientific theories. A scientific theory that, for instance, describes digestive mechanisms lies fairly close to surface phenomena and is accordingly, reasonably easy to test. Such theories are analogous to theories that posit a particular act (say a person getting over an illness) as the act of a supernatural agent. More abstract theological theories are analogous to more abstract scientific theories. Theories that posit God as a divine watchmaker are hard to test, but so is string theory.

Whatever the philosophical or scientific merits of theological conceptions of God, this abstract theism has the disadvantage that it is extremely remote from religious practice and experience. To find a concept of God that is more connected with religious experience, we must turn to the mystics. Mystics seek God not as a distant being in or

behind the world, but as a direct subjective experience of the divine. The aim of prayer, meditation or other individual or collective religious rituals is to generate a characteristic religious experience of enlightenment or Nirvana or some other form of oneness with God or the divine. There are mystical elements within most or all major religious traditions, and similarities in the practice and experience of mystics transcend sectarian divides.

The crucial distinction between mystical and agency conceptions of God is the distinction between objective and subjective conception of God. Generally speaking, I understand the distinction between subjective and objective roughly in the way Nagel (1974) does. To say that an experience is subjective is to say that there is something it is like to have that experience. Subjectivity in this sense is intimately connected to consciousness. Subjective experience is private, in the sense that no one can have my subjective experience except me and the only way I can understand the subjective experience of others is by analogy to my own subjective experiences. Thus, when a mystic has an experience of God, that experience is essentially a set of subjective, conscious feelings, visualizations, sensations of peace or ecstasy, and so on.

Skeptics can of course doubt that this religious experience is an experience of God, but in asking this question, the skeptic generally has in mind the view of God as an active agent in the world. If God is a cause of events in the world, God may be a cause of the psychological events that constitute a religious experience, but it may be something else (say eating a certain mushroom) that brought about the experience. To the extent that a person uses such experience as evidence for a claim of the existence of an objective agent in the world, the skeptic indeed has reason for doubt. But the mystic is not

particularly concerned with the neurological properties of her brain during her experience, or what if anything exterior to her brain caused her brain to have these properties. The value of mystical experience does not lie in its ability to provide knowledge of the causes of events in the world, but in the quality of mind it brings to the experiencing subject.

It is certainly possible to engage in scientific research on what goes on in the brains of people having religious experiences, but no degree of understanding of these processes would eliminate the experiences themselves. To suppose otherwise would be like supposing that understanding the neurochemistry of falling in love would cease to make falling in love feel like falling in love. When I have fallen in love, I now suppose that my brain cells have been flooded with oxytocin that somehow rewires my neural circuits in such a way as to create psychological dispositions to pair-bonding. But even if I were to understand this process perfectly in an objective sense, it would not eliminate my experience of falling in love. And it is the subjective experience of love, rather than its neurological basis, that is love for me. If I had not been lucky enough to fall in love, then nothing I could have learned about the neurobiology of love could tell me what love is. For just these reasons, someone with a mystical conception of God may perfectly happily study what's going on in their brain, but doing so won't make God go away.[4]

3.3 Does a commitment to the truth and importance of sacred texts violate scientific canons of evidence?

Like our other questions, how one answers this question depends crucially upon what one means when one calls such texts true, important or sacred. I'll concentrate on the Bible, since that is likely to be most familiar such text to most readers, but the arguments here

should apply equally well to the Qur'an, or to sacred texts of non-Abrahamic religions. The gist of my position will hardly be surprising – that it is possible to treat these texts as true and important so long as they are interpreted symbolically rather than literally – but it may still be worth considering briefly both how literalism conflicts with scientific standards of evidence as well as how and why certain symbolic approaches do not.

While Biblical literature is diverse in genre, it is dominated by narratives describing past events of human and natural history. Because Biblical literature is not traditionally treated as "fiction" (and indeed long predates the concept of fiction), it is natural perhaps to take these narratives literally as reports of what readers would have seen and heard if they had been there. But to treat Biblical narratives in this journalistic manner is to put them in to the natural and social world. Once they lie in this world, then basic epistemic principles require (a) that readers evaluate the credibility of these reports in the same way they would evaluate the credibility of other written reports from the distant past, and (b) they seek to reconcile conflicts between the claims of these texts and claims made by other texts and other potential sources of evidence, including scientific evidence. Such inquiries, which are much of the business of contemporary Biblical studies, suggest that the case for Biblical literalism is exceedingly weak. Most Biblical scholars would probably not go so far as David Hume, who characterized the Pentateuch as "a book, presented to us by a barbarous and ignorant people, written in an age when they were still more barbarous, and in all probability long after the facts which it relates, corroborated by no concurring testimony, and resembling those fabulous accounts, which every nation gives of its origin" (Hume 1777, p. 130). But it is difficult, if one does not come to the matter with a kind of faith that we have already seen is inconsistent with a

scientific worldview, not to conclude that there are many better explanations of why the Biblical narratives are as they are than that they are journalistically accurate accounts of events.

A proponent of Biblical literalism might grant some of the evidence that suggests, for instance, that the authors of Biblical texts often wrote about events that they did not personally observe, but at the same time claim that, in virtue of divine inspiration, they still had access to the true history of these events. But if we take divine inspiration literally as some sort of mechanism by which God or the Holy Spirit manipulates the thoughts of an author, then we are positing precisely the sorts of CPS agents discussed in question two, and, as discussed above, the case against the existence of such agents is, from a scientific point of view, quite strong.

The standard approach for the religious compatibilist is to argue for a symbolic reading of Biblical literature. Such an approach avoids contradicting canons of scientific evidence by interpreting Biblical texts as doing something other than journalistic reporting on the sort of facts for which science (including in this case "scientific" approaches to Biblical studies) can find evidence. While some critics see symbolic readings as a retreat in response to the demands of science, such readings predate modern science by many centuries and count among their proponents many church fathers and Saints (e.g., Origen, Augustine, Aquinas). Moreover, there is nothing that requires one to suppose that such interpretations are reinterpretations of authorial intent. Modern humans use myths, fables, and other fiction genres to express beliefs or value that they think are true and important. One need not literally believe in Santa Claus to believe in Santa Claus. It seems like nothing more than prejudice to suppose that Biblical authors

hadn't thought of this. (Look at how Plato, writing at a time roughly contemporary with much Biblical literature, uses myth to say what he believed could not otherwise be said.)

A religious person might justifiably wonder why, if this is all there is to Biblical literature, that one could justifiably call such a text sacred. If a scientific worldview forces us to treat the Bible as myth or parable, aren't we forced to conclude that its standing is on a par with that of any other work of imaginative literature? In short, doesn't such a reading deny the Bible its sacredness?

One can resist this conclusion, but only so long as one finds a notion of sacredness that is compatible with naturalism. The Bible's sacredness cannot arise from the fact that it or its authors had a special kind of relationship with a CPS agent. But there are other ways to think about sacredness. Here's one suggestion: The Bible is important to us – Jews, Christians and Muslims – because it is sacred within a tradition to which we belong. We especially honor and value it because it is ours. It reflects the wisdom of our fathers (mostly fathers, some mothers – symbolically speaking of course). We value it in much the same way that we might value a set of family pictures. The pictures are important to us because they picture things that are part of our past. Other people's photo albums may contain pictures that are just as beautiful, charming or funny, and we might enjoy them, but we do not care about them in the way we care about our own anymore than they care about ours. Sacredness in this sense is wholly compatible with a scientific worldview and it makes explicable the fact that different texts can be sacred for different people.

3.4 DO DEVELOPMENTS IN SCIENCE – PARTICULARLY THOSE IN PSYCHOLOGY AND NEUROSCIENCE – THREATEN TO UNDERMINE RELIGIOUS DOCTRINES ABOUT FREEDOM OF THE WILL AND THE DIVINE NATURE OF THE SOUL.

Whatever the merits of the opposing arguments, there is little doubt that a great number of scientists and science students do in fact identify themselves as religious and see no incompatibility between their faith and their science. To use a phrase popularized by Stephen Jay Gould (1997), religion and science are non-overlapping magisteria – domains of human life with fundamentally different concerns. But, many otherwise hard-nosed religious naturalists believe that the magisteria do indeed overlap when we consider one subject of immediate concern to us all – our immortal souls. The traditional Catholic response to this problem was given by Pius XII:

> The Teaching Authority of the Church does not forbid that, in conformity with the present state of human sciences and sacred theology, research and discussions, on the part of men experienced in both fields, take place with regard to the doctrine of evolution, in as far as it inquires into the origin of the human body as coming from pre-existent and living matter – for the Catholic faith obliges us to hold that souls are immediately created by God (Pius XII (pope) 1999)

The hard question for the religious scientist is whether this division between body and soul, held as an article of faith, is consistent with the understanding of the nature of human and animal mind/brains that we derive from contemporary psychological and neuroscientific investigation.

To repeat a by now familiar refrain of this paper, the answer to this question depends entirely upon what one means by a soul. On one way of understanding the soul, the supposition of an immortal and immaterial soul is akin to a scientific hypothesis. The soul is a special part of the mechanism that controls human bodies (or other bodies, if you believe in animal souls). This is in essence the Cartesian understanding of the soul – a

special kind of substance whose properties (beliefs, desires, a will, etc.) influenced properties of the body.

This is not the place for a detailed discussion of the arguments against Cartesian dualism, but I think it is fair to say that the "doctrine of the ghost in the machine," as Gilbert Ryle so memorably described it, has been thoroughly repudiated by philosophers, psychologists and neuroscientists. It is not clear whether the theory is even conceptually coherent. Moreover, psychology and neuroscience have made and continue to make enormous strides in understanding the material basis of human and animal cognition, emotion, volition and behavior.

But this is not the only way to think about the soul. Rather than thinking of the soul as an elusive causal agent within the natural order, it is possible to think about it subjectively and experientially. In a 1996 speech to the Pontifical Academy of Sciences that commented on Pius' Encyclical, Pope John Paul II seems to point toward this way of understanding the soul:

> The sciences of observation describe and measure, with ever greater precision, the many manifestations of life, and write them down along the time-line. The moment of passage into the spiritual realm is not something that can be observed in this way—although we can nevertheless discern, through experimental research, a series of very valuable signs of what is specifically human life. But the experience of metaphysical knowledge, of self-consciousness and self-awareness, of moral conscience, of liberty, or of aesthetic and religious experience—these must be analyzed through philosophical reflection, while theology seeks to clarify the ultimate meaning of the Creator's designs (John Paul II (pope) 1996).

This last sentence is crucial, for it suggests that what lies beyond the realm of scientific observation is the analysis and explanation of various kinds of *experience* – of moral conscience, of liberty and so on. On this view the soul that is the concern of the Church's magisterium is the soul of first-person, subjective experience, not a piece of the mechanism that produces human behavior.

The distinction between these two views of the human soul parallels the distinction between two views of the nature of God discussed in question two. If one chooses to think of the soul or God as agents – as unseen causers of events in the natural world – than one's beliefs about God or the soul are scientific hypotheses about the causal structure of the natural world. Such hypotheses need to be evaluated using the same methods one uses to evaluate other such hypotheses, and they do not fare well. On the other hand, if one understands God or the soul subjectively – in terms of experience rather than causal agency – then God and the soul are not things at all. As such, questions about their existence or non-existence have no place in science.

3.5 DO SCIENTIFIC EXPLANATIONS OF THE ORIGINS OF MORAL BEHAVIOR UNDERMINE THE MORAL TEACHINGS OF RELIGIONS?

Like the science of the soul, the science of morality can seem pretty threatening to the religious believer. Many religious believers hold that the source of moral norms are divine commands, and attempts by scientists psychologists and evolutionary biologists to provide a naturalistic explanation of the origins of religious belief seem like a big threat. There is a long history of scientific attempts to explain religious behavior and the connection between religion and moral norms (Freud 1967, Dawkins 2006, Dennett 2006, Wilson 1998), and while some of these attempts contain some rather speculative or down-right bad science, in principle there is nothing wrong with scientifically examining the origins and operation of religious institutions, religious beliefs, religious rituals, as well as the connection between these institutions, beliefs and rituals and moral behavior. To the extent that naturalistic theories of religious and moral behavior can be developed, will this undermine religious and moral teachings? Once again, it all depends.

While this question touches on the science of religious behavior generally, let me focus on the question of the science of moral behavior – a topic of concern to religious believers but also to non-religious persons concerned with the nature of morality. Moral attitudes are cognitive states that give rise to various sorts of human behavior. These attitudes can be studied in a variety of ways: scientists may seek to understand the nature of the mental representations involved; they may seek to study variations in these attitudes across human populations; they may seek to understand how such attitudes develop in us from childhood, both in terms of genetic and environmental influences. More speculatively, they may offer evolutionary accounts – either biological or cultural – of moral attitudes. While these areas of research are methodologically complex, it seems reasonable to say that scientists in a variety of fields have contributed and will continue to refine theories that explain why human beings have the moral attitudes that they do.

But whatever the merits of the "science of morality," such a science cannot provide us with moral guidance. Any naturalistic account of moral attitudes can only tell us why, as a matter of fact, humans have the moral attitudes they do. They cannot tell us that these moral attitudes are in fact attitudes that we should (in a moral sense) have. To mistake a causal explanation of why we *do believe* things for a normative explanation of why we *should believe* things is to commit what philosophers call a genetic fallacy.[5]

Religious believers who think that ethical judgments derive their normative force from divine commands may run afoul of scientific arguments. If they believe that what causes people to have the moral attitudes they do is the activity of a divine agent, then this agent becomes a posited entity in the causal structure of the natural world and this hypothesis must compete with the sorts of causal explanations discussed in the previous

paragraphs. Such a strategy will run into the problems discussed in the response to question two. If religious believers cite sacred texts or traditions as sources of moral authority, scientists may provide naturalistic explanations of why those texts or traditions contain the moral teachings they do – explanations that may raise doubts about the reliability of these sources. But while the results of scientific research may probe the causes of human moral attitudes, no research will answer or eliminate the basic moral questions that human beings confront: what should we value in our lives, and how should we act towards ourselves and others?[6]

The fact that science properly construed cannot answer basic questions about morality does not imply much about how such questions should be answered. While such questions have been a perennial subject of concern to religious thinkers, they also have been a concern of secular philosophers and intellectuals of all stripes. The difficulties with scientific approaches to the study of moral theory should not be taken as providing an endorsement for religious approaches. My argument has only been meant to show that in looking for a foundation for moral judgments, neither the theist nor the atheist can look to science.

4 Conclusion

I have sought to explore the relationship between religious and scientific worldviews by examining several particular questions about sources of potential conflict. This piecemeal approach seems the best we can do, because there are so many different kinds of religious worldviews we might encounter. Nonetheless, the review of these particular questions may allow us to say something about the sources of potential conflict between religious and scientific worldviews.

The business of science is to explain and where possible predict the properties and behavior of objects and events in the natural world. If we construe science broadly, as I have suggested we must, the natural world must be taken to include the human world, including human minds, societies and all the artifacts of human culture. But the domain of science is delimited by the limitations of its foundational source of knowledge – publicly accessible features of the observable world. Broadly speaking, what appears to lie beyond this domain are (a) the subjective character of human experience and (b) values. In other words, science cannot answer questions about what it's like and what to care about. In the heyday of logical positivism, these questions were just the sort of questions that were identified as nonsensical by the principal of verification(Ayer 1952). But as critics of the principle of verification have been quick to point out, the principal of verification was itself nonsensical by its own standards, since, as a principle of action, it cannot be verified empirically.

The view that there are some questions science cannot answer is a view widely held – and in fact corresponds to the fifth of the pillars of science that Gauch derives from his reading of AAAS documents. Moreover, the way in which I have demarcated these questions is consistent with those pillars as well. Gauch emphasizes that science must be public, universal and evidence-based. These are exactly the features that cannot be provided in discussions of subjective experiences and values.[7]

It is tempting to conclude that Gould was right – that there can be no conflict between science and religion, because the magisterium of religion is concerned with subjective and normative questions, while the magisterium of science is concerned with objective and naturalistic questions. But it is important to recognize that Gould's view is

a normative account of how we should interpret our science and our religion – not a description of actual religious and scientific practices.

Paul Tillich's (1957) normative account of religious faith provides one clear model of a religious worldview that does not overlap with science. Tillich's view of faith and religious practice requires one to understand God in a remarkably abstract and non-personal way – God as ultimate concern. It also requires one to read scripture, liturgy and religious rituals in highly symbolic and non-literal ways. It requires that one entirely divorce questions of religious truth from scientific or historical truth. While such a view may be popular with some philosophers, scientists and theologians, it is not consistent either with popular religion, which is inextricably bound with notions of divine agency, or with the stated doctrine of many religious institutions.

We are left with the problem we started with – that it is impossible to characterize in general the relationship between scientific and religious worldviews because there are such stark differences among religious worldviews themselves. This fact raises a significant problem for science education. In the United States and in many other industrialized democracies, educators have traditionally tried to keep religion out of the science classroom. This strategy is dictated by legal demands for separation of church and state, but it also makes sense on its own merits if religion and science are non-overlapping magisteria. But the strategy breaks down when students hold religious views that include claims about the nature of God, divine agency, and the authority of prophets and scriptures that contradict the claims of science. It is hard to separate science from religion in the classroom if students hold religious beliefs about the natural and social world and its history that are inconsistent with scientific evidence.

Whatever the intellectual merits of the non-overlapping magisteria principle, many religious people have beliefs and attitudes that conflict with it. When a student makes faith-based claims about the natural world – including claims about the earth's or human origins, human cognitive mechanisms, and the like – the science educator must be prepared to judge whether such claims are or are not supported by scientific evidence. And when that evidence goes against these claims, the educator must be prepared to say that they are very likely wrong – even if such an assertion contradicts a student's deeply held religious beliefs. As science educators face this difficult task, it would be helpful for them to have some knowledge of the variety of ways in which it is possible to interpret faith, belief in God, the status of scripture, the nature of religious experience and the relation between religion and morality. Science educators need not tell students what to think about religion, but they can help students see that their own religious worldview is not the only religious worldview – not merely in the sense that there are other religious traditions besides the one they grew up in, but in the sense that there are a variety of worldviews embraced by those who belong to their own historical tradition.

As science educators face the challenge of confronting their student's ill-supported claims, it is comforting to think that at least some theologians will come to their aid. If we are to believe Paul Tillich, faith-based beliefs about nature and history are misguided not only as science but as theology. What looks to the scientist like epistemic foolishness may look to the theologian like idolatry.

[1] My thinking on the relation between religion and science has profited immensely from my interactions with my colleagues from both sides of Butler's department of Philosophy and Religion. I especially thank Chad Bauman, James McGrath, Tiberiu Popa and Paul Valliere for comments on an earlier draft of this paper.

[2] It must be confessed, that even if there is no possible collision between science and ultimate concerns *in principle*, there may be significant ones in practice. People's ultimate concerns, and more generally their values or prejudices, certainly can alter the way they interpret scientific evidence. The theoretical issue at play here is whether it is possible either in principle or in practice to separate epistemic and non-epistemic values. My account requires one to believe that these values are at least largely separable in principle.

[3] There are many scientifically informed philosophers who think materialism has its limits. Among them are McGinn, Chalmers and Jackson.

[4] Readers familiar with the philosophy of mind literature will note that this argument closely parallels standard arguments for the irreducibility of consciousness, qualia and other varieties of subjective mental states. See, e.g., (Jackson 1982, Nagel 1974)

[5] Some philosophers and scientists have argued that this sort of inference is not in fact fallacious and that we can get genuine normative claims about of "evolutionary ethics (Ruse, Wilson 1986). Such arguments seem to me to be weak. For a rebuttal of such claims, see (Kitcher 2006).

[6] Scientific research may be able to help us think about how to achieve our moral ends, but it cannot show us what those ends should be. For instance, there has been a good deal of research of late on the science of happiness, and such research may tell us how we can

most efficiently maximize people's happiness. But such research, however good, cannot establish the fundamental moral claim that we *ought* to seek to maximize people's happiness.

[7] There may be universal moral standards or presuppositions, but these are not the same as the presuppositions of science. Similarly, there may be universal human similarities in our subjective experiences, but subjective evidence can still not be shared in the sense demanded by science.

References

Ayer, A.J.: 1952, *Language, Truth and Logic,* Dover, New York.

Barbour, I.G.: 1997, *Religion and Science: Historical and Contemporary Issues,* Revised Edition, Harper Collins, New York.

Clifford, W.K.: 2001, 'The Ethics of Belief'. In A.J. Burger (ed.) *The Ethics of Belief*, Dry Bones Press, Roseville, CA.

Dawkins, R.: 2006, *The God Delusion,* Houghton Mifflin, New York.

Dennett, D.: 2006, *Breaking the Spell: Religion as Natural Phenomenon,* Viking, New York.

Freud, S.: 1967, *Moses and Monotheism,* Vintage Books, New York.

Freud, S.: 1965, *New introductory lectures on psychoanalysis,* Norton, New York.

Gauch, H. forthcoming, 'Science, Worldviews and Education', *Science & Education* .

Gopnik, A., Meltzoff, A.N. & Kuhl, P.K.: 1999, *The scientist in the crib : minds, brains, and how children learn,* William Morrow & Co., New York.

Gould, S.J.: 1997, 'Nonoverlapping Magisteria', *Natural History,* 106 (2), 16-25.

Hume, D.: 1777, *Enquiries concerning Human Understanding and concerning the Principles of Morals,* Third Edition with text revised and notes by P.H. Nidditch, Clarendon Press, Oxford.

Jackson, F.: 1982, 'Ephiphenomenal Qualia', *Philosophical Quarterly* 32, 127-136.

John Paul II (pope): 1996, 1996-last update*, Message To The Pontifical Academy Of Sciences: On Evolution: Magisterium Is Concerned With Question Of Evolution For It Involves Conception Of Man. Message Delivered to the Pontifical Academy of Sciences, 22 October 1996* [Homepage of Eternal Word Television Network], [Online]. Available: http://www.ewtn.com/library/PAPALDOC/JP961022.HTM [Access Date: 2007, 2/21].

Kitcher, P.: 2006, 'Four Ways of "Biologicizing" Ethics'. In E. Sober (ed) *Conceptual Issues in Evolutionary Biology*, Third Edition, MIT Press, Cambridge, MA, pp. 575-586.

Lacey, H.: 1996, 'On Relations between Science and Religion', *Science & Education,* 5 (2), 125-141.

Mahner, M. & Bunge, M.: 1996a, 'Is Religious Education Compatible with Science Education?', *Science & Education,* 5 (2), 101-123.

Mahner, M. & Bunge, M.: 1996b, 'The Incompatibility of Science and Religion Sustained: A Reply to Our Critics', *Science & Education,* 5 (2), 189-199.

McCauley, R.: 2000, 'The Naturalness of Religion and the Unnaturalness of Science'. In F. Keil & R. Wilson (eds) *Explanation and Cognition*, MIT Press, Cambridge, MA, pp. 61-85.

Nagel, T.: 1974, 'What is it like to be a Bat?', *Philosophical Review*, 83, 435-450.

Pius XII (pope) 1999, 1999-last update, *Humani Generus: (Concerning Some False Opinions Threatening to Undermine the Foundations of Catholic Doctrine). Encyclical Promulgated on 12 August 1950* [Homepage of Eternal Word Television Network], [Online]. Available: http://www.ewtn.com/library/ENCYC/P12HUMAN.HTM [Access Date: 2007, 2/19].

Polkinghorne, J.: 1986, *One World: The Interaction of Science and Theology,* Princeton University Press, Princeton.

Ruse, M.E. & Wilson, E.O.: 1986, 'Moral Philosophy as Applied Science', *Philosophy: The Journal of the Royal Institute of Philosophy,* 61, 173-192.

Settle, T.: 1996, 'Applying Scientific Openmindedness to Religion and Science Education', *Science & Education,* 5 (2), 125-141.

Tillich, P.: 1957, *Dynamics of Faith,* Perennial Classics, New York.

Wilson, E.O.: 1998, *Consilience: The Unity of Knowledge,* Vintage Books, New York.