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“Science and Christian Faith: The Pursuit of an Integrated and Complete Understanding of Humanity and the Cosmos”

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1. What initially drew you to theorizing about science and religion?

Any good philosopher whose principal interests lie in metaphysics and epistemology, as mine do, will have thought hard about the sorts of explanations that mature science does (and doesn't) provide, and what metaphysical commitments do (or don't) underlie them. She will also have thought about the metaphysics of theism (if only because so many important historical figures make theism central to their metaphysics and sometimes their epistemology) and about whether or not theism offers plausible forms of explanation of very general truths about reality. Finally, if she is herself a religious theist, as I am—I embraced the Christian faith at the same time that I began to study philosophy at university—she will think about the relationship of scientific and theistic explanations, not merely as concerns general aspects of reality, but also religious experience, purported miracles, and the like. That is, she will find herself deep in the thickets of 'theorizing about science and religion.'

A secondary motivation for engaging in this study is dismay at the state of public discussion of these matters. I am not *so* much surprised at the extent of fear or suspicion of sciences that touch upon human origins and human behavior among contemporary Christians (who run the intellectual and educational gamut), though I find it lamentable and, for those of any decent education, foolish. I am more surprised at the fairly common belief among secular *scholars* that there is a deep and unresolvable conflict between taking seriously both science and traditional religious belief—and I am especially surprised when this is the attitude of my fellow philosophers, who have the training to enable them to know better. I read very carefully reasoned criticisms of religious belief currently on offer; that is simply what philosophers are supposed to do and, in any case, I have no interest in constructing my life around a supposedly comforting lie. If there is good reason to think that Christianity, or mere theism, is false, I want to know it. There are some challenging criticisms of such commitments given by philosophers I respect. There are also some embarrassingly bad criticisms given wide public play, mostly by scientists who lack the ability to see where science leaves off and scientifically-informed philosophical

reflection on reality begins, but also in some cases by philosophers. (I recently attended an exchange on the compatibility of science and religion by two prominent philosophers, since published as a book. Neither side made a particularly compelling case, but as the philosopher arguing the ‘con’ side spoke, I couldn’t help but marvel at the high ratio of mere rhetoric to argument. I was sorely tempted to stand up and offer to finish the job, confident that I could argue his side a whole lot more cogently than he was doing!) It appears that many scientifically-motivated critics of religion don’t bother to read the most careful proponents of reasoned faith. If I am correct in this judgment, it says nothing about the relative merits of religious and non-religious conceptions of reality. It merely reflects the common tendency to get sloppy when arguing a thesis that is already widely held by one’s immediate peer group or target audience. Criticisms of the state of public play aside, I am committed to pursuing an integrated system of personal belief. For me, that means thinking hard about science and religion.

2. Do you think science and religion are compatible when it comes to understanding cosmology (the origin of the universe), biology (the origin of life and of the human species), ethics, and/or the human mind (minds, brains, souls, and free will)?

First, a brief comment on how I will be understanding, for present purposes, each of the three crucial terms: ‘science’, ‘religion’ and ‘compatible’.

‘Religion’ covers an enormously varied range of human practices and beliefs (among other attitudes), and it is impossible to give the question, taken in its full generality, a straightforward answer. I will take it as shorthand for theistic religion, and more specifically Christian religion anchored in the Nicene Creed, just to give it a clear target that captures much of what is in view when one speaks of the compatibility of the sciences and Christianity. What I say about the question so construed will carry over to other forms of revealed monotheistic religion. I am concerned specifically with the beliefs and other attitudes that are *common* to Christian subtraditions that affirm the Nicene Creed. It is evident that some varieties of Christian belief are incompatible with modern cosmology and biology—those varieties that insist, on religious grounds, on the truth of young earth creationism, for example.

As for ‘science’, we may take it to encompass not just the deliverances of various mature sciences (such as scientific theories, laws, and the identification of causal mechanisms), but also a commitment to the soundness of its characteristic methods of empirical investigation. Some who are skeptical of (some of) the deliverances of established scientific theories (e.g., natural evolution) profess adherence to what they deem the methods of science, claiming that ‘mainstream’ science gets things wrong by allowing underlying metaphysical commitments such as metaphysical naturalism skew their interpretation of the evidence. I believe that this criticism is not well-founded. But even if they were right, they would not be thereby demonstrating the compatibility of their ‘creationist’ views with science as I am using that term, as the latter encompasses both characteristic methods and well-established results (there is vagueness on the boundaries of ‘well-established,’ but nothing of interest here hangs on that).

Finally, the question we are interested in requires us to give a broad, somewhat vague meaning to the word ‘compatible.’ The truth of a great many unreasonable ideas is *logically* compatible with acceptance of the results of modern science and its methods for investigating the world: no contradiction is generated by adding such ideas to the body of scientific commitments (assuming, nontrivially, that those commitments themselves do not entail contradictions). But compatibility in that sense is of little interest. What is interesting and much disputed is whether

the commitments of creedal Christianity—that there is an omnipotent, omniscient, and wholly morally good supernatural being who is the source of everything else, our universe included, who has special regard for his human creatures, and who has miraculously acted in human history at various times and places, most spectacularly in his incarnation in Jesus of Nazareth on a rescue and restore mission—are *consonant* with what science teaches us. Put negatively, what I mean is that Christian commitments are not rendered highly unlikely by those teachings; put positively, one who grasps both Christian and scientific commitments might rationally affirm them jointly. We could spend a lot of time trying to pin down the operative notion of ‘rationality’ here, but I will take it as reasonably well understood.

Cosmology

Modern cosmology indicates that our universe is approximately 13.8 billion years old, expanding continually from a highly compressed state under the impetus of a small number of fundamental forces. *Perhaps* it is finite in measure but lacks a first moment. *Perhaps* it is a product (inevitable or evitable, as the case may be) of a prior physical reality—and perhaps one of a very large number of such products. And there are other scenarios besides that are open on current evidence and have attraction to at least some respected theorists. Is the well-established core, supplemented by any of the speculative ‘additions’ to it now in currency, consonant with creedal Christian belief, e.g., that God is the creator and sustainer of ‘heaven and earth’?

I think the answer is evidently yes, and that the reasons for thinking so were articulated well long ago by Aquinas and Leibniz. Fundamental physics aims to give a unified, parsimonious, and accurate account of the basic structure and dynamics of physical reality. It has not fully realized its aim yet. But we can readily imagine in broad outline explanatorily ideal limit-case scenarios: On one, final physical theory bottom out in a single fundamental property and property-bearer, with a single, relatively simple and elegant equation governing the co-evolution of instances of the fundamental entity type through a beginningless spacetime. On another, physical theory tacks in rather a different direction. Rather than burrowing down to simple foundations of a single universe, it spreads out. Satisfyingly complete explanation may be achieved, it is claimed, through the devising of an elegant and empirically adequate theory that locates our universe within a vast structure of totalities that exhibits completely non-arbitrary properties: a plenum of (largely) disjoint island universes. This way’s limit case involves the existence of all mathematically consistent totalities: all possible universes, as MIT physicist (and closet metaphysician) Max Tegmark (2008) proposes. Verifying either of these limit scenarios would be a spectacular explanatory achievement. But neither would yield a *complete* explanation of physical reality, one that involves no brute givens, leaves no explanatory loose ends whatsoever. For the most fundamental contingent fact that physical reality *is as described* would necessarily be left unexplained. Even a plenitudinous multiverse invites the question: why is there this multiverse? Why not just one universe, or seventeen, or none at all? (These questions are *not* to be understood as requesting purposive explanation—just explanation, in any of its basic varieties.) To answer this sort of question, we must pass from physics to metaphysics. Classical theism proposes the schematic answer: God, a necessary being, and the fount of all possible contingent reality, freely and purposively willed into being that which is, having been capable of willing into being any of a variety of alternative possibilities. If an explanation conforming to that schema were true, God explains that which fundamental science does not—and cannot. Empirical science provides metaphysically contingent, not necessary explanations,

and a bit of reflection shows that an adequate explanation of contingent existence must come from outside the connected web of contingent existences, from a realm of necessity. Modern cosmology, then, whatever its future course, can pose no threat to Christianity's claim that God is the ultimate source and sustainer of the reality we inhabit. To be sure, there are alternative *metaphysical* explanations one might propose, including questioning the claim that our universe (or multiverse) exists only contingently. But these challenges to theism come from alternative metaphysics, not physics. (For a view on the relative merits of various metaphysical explanations of ostensibly contingent reality, see my *Theism and Ultimate Explanation*.)

Biology

I pass on to modern biology. It has been well established that all forms of life now present on earth are linked through a common ancestry. From life's origin on earth some 3.5 billion years ago (which is not yet well understood), all subsequent living organisms descended through endless cycles of reproduction and maturation involving small modifications in genetic information, some of which took hold and led to stable variants in a way that natural selection describes, eventually leading to a vast tangled tree of life. We modern humans occupy one offshoot of that tree, which is more like a sprawling bush than a Christmas tree with an apex. We are the product of a great many adaptations in ancestral hominid and pre-hominid species to the contingent challenges and opportunities of specific environments—better, one outcome of a co-evolution of diverse life forms inhabiting the same environmental niches. We have a great many finely honed biological and cognitive assets alongside various biological liabilities, the result of inevitable trade-offs in the natural selection process. Our adaptation as a species slowly continues. Life itself is now understood to be an extraordinarily complex biochemical process, an interplay of myriad cellular and intercellular mechanisms with 'top-down' organismic control parameters as emphasized in the recent resurgence of systems biology.

This revolution in our understanding of human life and its place in the natural world poses several *prima facie* challenges to traditional Christian theology. I have space to consider but three, and these only briefly.

First, it is sometimes thought that the non-purposive character of biological evolution and its central mechanism of natural selection contradicts the theological claim that God purposively created us. This thought, while often expressed by educated, thoughtful minds, is easily seen to be mistaken. Evolution by a slow process of descent with modification *is* contrary to the common picture of God's 'specially' creating humans in a virtually instantaneous, supernatural manner. But that picture, based of course on a literal reading of the creation narratives in the first two chapters of *Genesis*, is not a creedal commitment, and it wasn't even held by all Christian theologians before Darwin. (No less significant a figure than St. Augustine [354-430] did not hold it.) Furthermore, modern biblical scholarship gives us very good reason to think that such a literalist construal of *Genesis* rests on a misunderstanding of the genre from which it arose. In any case, Christians (and theists of every stripe) can maintain that God's purposive creation of human beings is manifested in his creating and sustaining a world with fundamental laws that undergird the very biological processes that in the fullness of time gave rise to us. Natural evolution is not intrinsically purposive, but that is fully consistent with its being extrinsically purposive—caused to unfold in accordance with the intentions of the designer and creator of the whole universe, not just the biosphere.

Some say that a more careful consideration of natural history offers a less easily

resolvable challenge to the thesis that God's providentially designing our universe's basic physics suffices for his purposively bring about *us*, specifically. Evolutionary developments, they say, are fraught with contingencies, such that things could have easily gone in very different directions, with very different kinds of creaturely outcomes. Evolutionary fitness is relative to one's environmental niche, and small changes in the actual environments faced by myriad species would have led to very different selection pressures and so outcomes. To take one dramatic example, if the meteor that apparently struck our planet sixty-five million years ago had instead been a near-miss, the planetary climate would not have undergone the radical change it did (becoming much colder), making vegetation in various regions relatively scarce. The near-miss scenario could easily have happened. But the non-inevitable meteor strike did occur, and the ecological changes that it brought about were important factors in making small mammals to be comparatively better adapted to their environments than large dinosaurs, so that the dinosaurs waned and mammalian life flourished. We, in short, were not inevitable. If God did intend us to be among the outcomes of a long evolutionary process, He got lucky, as it was unforeseeable hundreds of millions of years back.

Simon Conway Morris and others challenge this 'evolution is fraught with radical contingency' argument by claiming that there is good evidence for 'convergent evolution,' a kind of inevitability that evolution will hit upon certain solutions to problems faced by species of certain kinds. (Among the considerations they marshal is the fact that certain structures such as the eye have evolved multiple times, independently.) With regards to our meteor scenario in particular, Conway Morris argues that mammals were already on a path of biological ascendancy and, even without the radical climate and vegetation change, would have steadily developed much as they in fact did. Since this a debated biological issue, let me here set aside the significance of biological convergence and assume the truth of the radical biological contingency thesis.

As the very example of the meteor so dramatically illustrates, biology is not a 'complete' science in the sense that non-biological factors play an important role in explaining biological outcomes. (A more everyday example is provided, unfortunately, by auto accidents.) The biosphere is set within a wider physical realm. What is more, the structures and mechanisms of the species populating the biosphere are ultimately grounded in explanatorily and ontologically more basic physical structures and mechanisms. As a result, what looks radically contingent from a narrowly evolutionary-biological point may be inevitable from the point of view of LaPlace's physical calculator—or God. If there is a problem with seeing God as exercising providential control over the evolutionary development of humans, it will have to come from physics, not biology alone.

As it happens, physics does raise such a challenge, in the form of indeterminism in the processes described by quantum mechanics, our most basic science. Well, the proper interpretation of the spectacularly successful formalism of quantum mechanics is, famously, anyone's guess. On one empirically adequate interpretation, indeterminism is merely epistemic, not ontological. But let us suppose that there is genuine, ontological indeterminism down in the basement of our universe. Suppose further (what is not inevitable) that this indeterminism manifests itself at the level of description appropriate to genetic mutations. Then it is quite possible that mutations entered the gene pool of our ancestors in the very distant past at crucial junctures, influencing evolutionary trajectories that gave rise to us. If all this were so, it might be that not even an omniscient being could have foreseen and planned on that basis for the particular outcome of the physically indeterministic events constituting that crucial mutation or

mutations. There is much to say (and which has been said, by philosophers) relevant to the last step in the argument, occurring in the previous sentence. But one thing a theist may say is simply this: if all this were so, there is nothing in science that precludes our supposing that God supernaturally insured that the ‘right’ (i.e., desired) mutation occurred. What was physically undetermined was made to occur by the will of God.

At this point, critics of a certain temperament will cry, “God of the Gaps theology! I knew you were going to resort to that scurrilous, anti-scientific tactic at some point!” To which I reply, “Calm down. If this is God intervening in certain ‘gaps,’ it is not of an objectionable sort—not objectionable unless one has already ruled out a priori that the world is caused and sustained by God. If that’s your view, it’s a philosophical, not scientific commitment that is driving your argument.” I am no fan of God-of-the-gaps moves in natural theology, where God is invoked as the immediate cause of some as yet not-well-understood natural phenomena or process in such a way as to preclude there being a natural form of explanation. The sorry history of such moves is a large part of the reason that many educated people see a tension between science and Christian theology. (“How do we account for evolutionary transitions across major phyla? God created ex nihilo some initial set of creatures for each such phyla.”) But nothing like that is being entertained here. Ex hypothesi, on some rare occasions there are outcomes of basic physical processes that are physically undetermined, and these outcomes determine what form a particular mutation will take, a mutation that is a necessary condition on a large-scale evolutionary trajectory’s occurring as it does. We do not know that events meeting this description actually occur, we are supposing that they do for the sake of argument. What I (and others) suggest in response to this conjecture is that what the physical processes leave open on such occasions, God selects and determines a particular outcome. The selected outcome is consistent with what the physical laws predict, and so God’s special activity is not posited as an alternative to a possible naturalistic explanation. LaPlace’s calculator, observing such events, would be none the wiser, as the event would fit the patterns hitherto observed for similar events.

Space precludes giving full discussion to issues this sort of suggestion raises concerning the nature of proper scientific commitments. I will have to say, somewhat cavalierly, that we need to be ever mindful of the difference between science proper and metaphysical glosses on science. Newton was conscious of such a difference when he famously said in the “General Scholium” appended to his *Principia*, “I feign no hypotheses” concerning the basis for the properties of gravity posited by his theory. (Indeed, Newton was instrumental in cementing the difference by shaping the way that we have come to understand scientific explanation.) Following philosopher David Hume, some scientists and philosophers see in the general laws and mechanical descriptions of various sciences nothing but contingent patterns running among distinct natural occurrences. They are simply compact, observationally adequate descriptions of the regular ways that events occur. Others, going all the way back to Aristotle, see more: the best interpretation of the success of mature sciences is that their theoretical descriptions approximate entities and structures disposed towards just the outcomes observed. That is, there is a kind of natural necessity to the way that physical objects and structures behave. Either of these views, I take it, are fully consistent with science proper. Consider the view suggested by Hume. If that minimalist view is consistent with the achievements of science—things ‘just happen’, and happily for us, they just happen to happen in regular patterns, so we can do science, there’s nothing more to be said—then so is the following twist on it: everything that happens happens because God directly brings it about (God is its sole and complete metaphysical cause), and happily for us, God chooses to do so in regular patterns, so we can do science. That is the view

known as ‘occasionalism.’ Now, my point in this brutally but necessarily brief review of some disputed metaphysical glosses on science is simply this: scientific commitment is, first of all, commitment to using, or respecting the use of, certain methods to study such things as natural processes, patterns (both developmental and recurring), and important limit phenomena such as the origin of the universe or of life. And it is, second, commitment to accepting provisionally the theories, laws, mechanisms, and descriptions that are well-confirmed outcomes of using the approved methods. Having made those commitments, the metaphysician, whether religious or not, is free to work within the constraints they impose to construct a vision of reality. Whether her vision is reasonable will be adjudicated on philosophical, not scientific grounds.

Another challenge that modern biology poses to traditional Christian theology concerns the theological role played by the story of Adam and Eve, especially in much of Western Christian thought. According to much of Western Christian theology, theological truths embedded in this narrative include the proposition that human beings were made for fellowship with God and originally experienced such fellowship until certain of them became estranged from God through a form of prideful rebellion. Rather than immediately repairing that breach, God chose to allow humans to continue in their estrangement but made plans to redeem them in a way that requires the free cooperation of human individuals. At least as traditionally interpreted, Adam and Eve are depicted in *Genesis* as the first pair of human individuals. But modern genetic analysis indicates that the human population was never smaller than between 2,000-10,000 individuals. So, whence ‘the Fall’?

Here, science has indeed forced reasonable Christians to re-think an important Christian teaching. While it may come as news to many, even traditional Christian theology at its best has been a progressive tradition of inquiry, anchored by creedal fixed points. There have been a number of creative proposals for how one might envision a ‘fall’ event or process fully consistent with what biology reveals about human history. (To be fully consistent, they of course must not include the common but unnecessary assumption that animal predation and suffering, and human proclivity for immoral behavior of various kinds, all happened post-‘fall’.) These proposals are necessarily speculative, as we lack concrete data (whether from natural history or revelation) that would enable such proposals to be put to the test. They are and will remain ‘just-so’ stories, perhaps somewhat adjudicable for goodness of fit with biological evidence and theological doctrine, but hardly decisively. Rather than spell out these alternatives here, I refer the reader to Christian biologist Dennis Alexander’s fine book, *Creation or Evolution: Do We Have to Choose?*, which canvasses several of them.¹

My mention of animal predation and suffering brings us to a final, very widely voiced challenge to theology that is often seen as made especially acute by our understanding of evolutionary history. It is the fact of widespread, intense, unjust and indeed seemingly random experience of great pain and suffering, followed eventually by death, itself often gruesome. Though the challenge here is quite significant, I will be very brief. I do so in part because modern philosophical discussion of the ‘problem of evil/suffering’ is quite complex, and in part because I don’t see that modern science really adds much to the force of the problem. Even if the pre-human natural history of animal suffering were not as extensive as it has been shown to be, we have more than enough animal and human suffering within the human era to pose the problem. Yes, evolutionary biology takes away the option of chalking it all up to the disastrous consequences of human misuse of free will, but that was already woefully inadequate for an adequate explanation of the suffering that humans have been able to observe.

So what alternative form of theodicy do I propose? None. I am unaware of any fully

adequate account of why an omniscient, omnipotent, omnibenevolent Creator would allow all of the kinds of horrendous suffering that occurs in and around us. But I also don't take the inability of human beings to come up with such an account to be significant evidence against the claim that God exists and has morally good reasons for permitting such suffering. It would be such evidence only if it were plausible that if there were such a reason, we would be able, in time, to discern it. But we do not have good reason to suppose this. Our perspective is too limited, our grasp of the complex ways that great good and horrible evils can interact is too meager, and, perhaps most importantly, we have no reason to believe that we are in a position to see, even dimly, all of the kinds of great goods that eschatologically transformed human nature is capable of experiencing. Christian theology is committed to a human afterlife (on which more anon). Apart from such a commitment, the facts of unjust suffering would indeed constitute the materials of a compelling argument against theism. But given such a commitment, all bets are off when it comes to whether such facts, including those revealed by natural history, might play an integral role in a future life of surpassing value.

I am aware that these brief remarks will seem trite and callous to many offended by the idea of theism in the face of human and animal suffering. They certainly are not words that would provide (or are intended to provide) comfort to a terribly suffering person. Even so, they seem to me to be true and to pose a significant obstacle to those who would give, not merely an impassioned speech intended to cow the theist into silence in the manner of Ivan vis-a-vis his brother Alyosha in Dostoevsky's *Brothers Karamazov*, but an argument with clearly articulated premises from suffering to the (probable) non-existence of God. The reader is encouraged to consult the extensive recent philosophical literature on this point under the heading of 'skeptical theism.'²

Psychological and Brain Sciences and the 'Soul'

In much of popular religious (indeed human) thought, human beings are or have as a part an immaterial soul that is the bearer of psychological attributes. It is this, rather than anything bodily, that constitutes our identity as persons and that enables us to survive death.

While this mind-body dualism can seem very natural from a first-personal point of view as an experiencing subject, and it is ably defended in the writings of contemporary philosophers Richard Swinburne and Dean Zimmerman, among others, I take it to be implausible given the explosion of information coming from the third-person perspective of the natural sciences, specifically evolutionary and developmental biology and cognitive neuroscience. This information, while still incomplete and only imperfectly understood, sheds light on the deep natural history of humans and present-day animals; the processes by which individual organisms of any species develop from inception to maturity; some of the function-specific neural structures and processes that sustain and help regulate the unfolding first-person perspective of conscious agents; and finally, observed correlations between increasing complexity of neural structures and increased psychological complexity (in organismic development and across sentient species).

This third-personal scientific information does not comport well with the two-substance or dualist metaphysical account of human persons. The fundamental problem is that our sciences point to highly continuous processes of increasing complexity, but the two-substance account requires the supposition of abrupt discontinuity. The "coming to be" at a particular point in time of a *new substance* with a suite of novel psychological capacities would seem to be a highly

discontinuous development, both in large-scale bio-geological time and within the development of individual organisms. Furthermore, since souls as purely immaterial things would lack parts, we cannot make sense of the accumulation or diminishment of capacities by proposing increased or decreased structural complexity within the bearer of such capacities. And it just seems implausible to suppose that all the necessary basic capacities for, say, calculus problem-solving are there in the human soul from the beginning, awaiting only physical maturation in the body in order to become activated, rather than being directly dependent on that maturation for their very existence. It seems rather that psychological capacities arise and develop in tandem with the development of the brain and nervous system.

Of course, it is possible for the soul-body dualist to retrench: we might offload to the brain ‘side’ of the divide some of the psychological functioning that, prior to the advent of neuroscience, we might have mistakenly thought belonged to the soul. But that tack risks (as neuroscience progresses) reducing the soul to a simple, immaterial object that is radically incomplete, a mere “bearer of consciousness” that enables personal identity over time and through death.

Now, among the very many who agree with what I have just said, it is common to embrace the opposite extreme, on which conscious states are either epiphenomenal—having no influence on other psychological states or bodily behavior—or (somehow) consist in complex states of the brain. Yet this seems to me to be even less plausible than mind-body dualism. Conscious states of experience, thought, emotion, and purposive agency are our most immediately accessible empirical phenomena, and consequently they lie at the root of all our understanding of the world around us. We are not simply given *the world* to our understanding, we are given most immediately our *experiences* of it. To deny this givenness is to cut off the branch on which scientific understanding sits. And, while not self-defeating, the claim that all such experiential and belief states and purposive intendings just are complex neural states is also deeply implausible. We have direct, first-personal acquaintance with properties of these states that are manifestly different in kind from the complex, hierarchically-structured, physico-chemical properties of the brain states that are the most plausible candidates for such an identification. Just consider the feeling of a sharp pain or of coming to understand a complex scientific idea; the look of a red rose in bright sunlight; the confident, considered belief that Beijing is the capital city of China; the thought that it is doubtful that there is life on Mars; and your conscious decision to pick up some milk on the way home. Each of these states have distinctive, immediately apprehended intrinsic features that in no way resemble the sorts of features had by complex neural states on our best theories. True, recent findings have shown the fallibility and manipulability of our conscious self-awareness. Here, it will suffice to observe that the inference from fallibility to worthlessness is a poor one and one that plays into the hands of the radical skeptic concerning any human knowledge of the physical world itself. (Just run the inference on our fallible senses and inferential capacities.)

What does a middle way between dualism and reductionism look like? Among the many terms that have gained currency, “emergentism” is perhaps the most popular. But we should be careful to note that this term has meant different things to different thinkers. Here I shall use the term to indicate a view of the natural world on which human persons and other sentient animals (and *possibly* a wider array of impersonal complex systems) have irreducible and efficacious system-level features. These features are originated and sustained by organizational properties of the systems (in animals, by properly functioning brain and nervous systems) while also having in turn a causal influence on components of the system. That is, emergent systems involve an

interplay of ‘bottom-up’ and ‘top-down’ causal factors. There can be—in principle—no adequate description of such a system simply in terms of the outworking of fundamental physical forces in and around it. Emergent properties are primitive features of complex entities that make a fundamental (non-redundant) difference to the way the world unfolds. They confer a substantial unity on the systems, such that one is *required* to treat them as wholes in any minimally adequate characterization of the character and dynamics of the world.

While emergent systems are not fundamental building blocks of the world, they are, so long as they persist, causally basic entities. Why is this important to insist upon in connection to religious (and specifically Christian) belief? One reason is that it is consistent, in a way that the austere reductionist picture is not, with Christian teaching that the category of person is of fundamental significance and that human beings are capable of moral freedom. The personal does not reduce to the impersonal, and mature, intact human beings are capable of making choices in a way that confers moral responsibility.

A second reason for insisting on the unity or basicity of persons, despite their materially composed nature, is that it better comports with the teaching that we will all survive death. This will not be obvious. For emergentism, too, offers an embodied view of the soul, and we all know what death entails for our bodies. Note that in all the Abrahamic religions, human persons are not naturally immortal. (All of created reality is sustained in existence by God.) Survival of death would be a supernatural gift. Alas, we don’t (yet) get to see the miracle in action of God’s transporting us into another form of life and we have not been vouchsafed an account of how it goes. Thus, all we can do is speculate. Philosophers have done plenty of that, but there’s no space here to survey some of their ingenious ideas. But, to get you started, note that no particular bits of matter are essential to any living thing—biological life is continual change. On the emergentist account of embodied persons, I suggest, what survival would require is sufficient psychological continuity embodied in a minimally materially continuous but changing process. And with that, I offer a teaser: if God could endow the particles of my body (or some crucial subset of them) with the ability to fission into separated spaces, and arrange for this to occur just at the moment of my demise, then maybe...

3. Some theorists maintain that science and religion occupy non-overlapping magisteria—i.e., that science and religion each have a legitimate magisterium, or domain of teaching authority, and these two domains do not overlap. Do you agree?

My discussions above of the relation of biological and psychological and brain sciences to elements of Christian theology suffice to indicate that both in fact speak to overlapping phenomena: human nature. And since I accept that both have things to teach us, I cannot agree with the ‘non-overlapping’ part of the claim, taken strictly. And those who reject Christianity and any other religion purporting to speak to such matters will reject the ‘religious magisterium’ bit. Really the only ones who can accept the claim as it stands are advocates of a neutered theology.

However, the suggestion (by Stephen J. Gould) is often cited because it is in the neighborhood of something true: the questions to which science and a religion such as (un-neutered) Christianity propose answers are to a very significant *degree* non-overlapping. Christian theology to a great extent is concerned with our ‘knowing’ and being rightly related to God and to the ways that our relationships with one another should flow from such knowledge and relationship. God and God’s purposes are simply not an object of empirical science.

4. What do you consider to be your own most important contribution(s) to theorizing about science and religion?

My main contribution is my 2008 book *Theism and Ultimate Explanation*.³ In it, I argue for the explanatory power of theism with respect to the question of why this particular physical reality we inhabit exists. I argue that the explanation it provides complements, rather than competes with, current and future attempts to better understand the basic structure and dynamics of the universe and its physical origins. Theism, as I see it, contributes to a more intellectually satisfying, because more complete, account of reality.

I am currently writing a book that more squarely addresses specific issues concerning the integration of our best current scientific understandings (from both particle and spacetime physics, evolutionary biology and its more speculative recent offshoots, and the psychological and brain sciences) into a broader Christian understanding of reality. As my brief remarks here indicate, I believe that a non-ad hoc, intellectually satisfying integration is achievable.

5. What are the most important open questions, problems, or challenges confronting the relationship between science and religion, and what are the prospects for progress?

One open question is whether extraterrestrial intelligent, morally-governed life can be harmonized with the Christian doctrines of the incarnation and atonement. (For those who take multiverse hypotheses in physics seriously, such non-human life is virtually certain and incredibly extensive.) I have explored this matter in a forthcoming paper co-authored with Philip Woodward.⁴

Another matter that has been discussed but perhaps not resolved is whether *certain kinds* of naturalistic explanations of the human disposition to religious and moral belief, experience, and practice call into question beliefs in the objective reality of God or morality. It is one thing to explain, another thing to explain in a way that appears to debunk—to reveal the practice, somehow, as *not* rooted in response to the putative reality that is the object of the beliefs or experiences. What kind of candidate explanations are debunking? This is much harder to say than many in the commentariat seem to assume, but it seems that some are. (Freud's account of theistic belief as wish fulfillment has little to recommend it, empirically. But it certainly seems to be debunking.) I advise scientists to leave this question to philosophers who specialize in epistemology. Though it's rather more popular, amateur philosophy is no less cringe-inducing to the professionals than is amateur science!

¹ Monarch Books, 2008.

² See Trent Dougherty and Justin P McBrayer, eds., *Skeptical Theism: New Essays*. Oxford University Press, 2014.

³ Blackwell Publishing.

⁴ "Trans-Universe Identity: Incarnation and the Multiverse," in in Klaas Kraay, ed., *Theism and the Multiverse*. Routledge Studies in the Philosophy of Religion. Routledge Press, 2014.