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BOOK REVIEW

Michael Ruse: *Science and Spiritutality: Making Room for Faith in the Age of Science*

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1 Introduction: Sophistry and Illusion

Michael Ruse has written an insightful and accessible book belonging to the genre of rapprochements between science and religion. Ruse is not only a leading philosopher of science but also an exemplary popular writer whose style is sophisticated and lucid, but not dry. His book is not a technical work for specialists, but one with wide appeal that is informed by the best science and philosophy. The considerable virtues of the book from this point of view are not diminished by the fact that there are grounds for strong reservations about its arguments.

Ruse explains the theme of his book:

> I am far from thinking that science is all there is in life, and it is this belief that motivates me here. I want to ask about the nature of science and about its limits. I want to see if indeed science is truly so antithetical to religious thinking. I want to see if, rather, one can be both a scientist or lover of science and, with integrity, a person of religion … (p. 7)

In particular, Ruse wants to show "the basic, most important claims of the Christian religion lie beyond the scope of science. They do not and could not conflict with science, for they live in realms where science does not go" (p. 234).

This is a widely held and obviously appealing line to adopt for those, like Ruse, who are committed to the scientific enterprise and its claims. However, I will suggest that, despite its appearance of open-minded ecumenicalism, the posture faces insuperable intellectual difficulties. In wishing to leave room beyond "the allowable scope of science" (p. 235), Ruse is effectively endorsing a traditional demarcation between science and metaphysics in order to restore respectability to some claims in the latter category. However, this recidivist project does not properly address the hegemonic nature of the scientific enterprise. This conception is expressed in the final remarks of Bertrand Russell's (1935) book *Religion and Science*. Aside from questions of value that lie outside the realm of truth and falsehood, Russell says:

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> Whatever knowledge is attainable, must be attained by scientific methods; and what science cannot discover, mankind cannot know (1935, p. 243).

The title of Freud's (1927, 92) book *The Future of an Illusion* refers to religion and ends with the exactly the same sentiments: "an illusion it would be to suppose that what science cannot give us we can get elsewhere". These expressions of a positivist conception are less dogmatic than they appear because they may be understood as statements of the open-mindedness of science rather than its opposite. That is, "science" doesn't exclude anything simply because the honorific label is used for anything worth believing. That is, if there are any rational grounds for a proposition, it will become included within the domain of established science. Or, rather, perhaps we should say that it will be included on the spectrum of claims ranging across 'good, bad and bogus' to use the sub-title of Gardner's (1981) book. The point is captured in Laudan's (1983) account of the "Demise of the Demarcation Problem" since he shows that "the problem of demarcation … is spurious" and the heterogeneity of beliefs and activities means that there are no lines to be drawn (see Special Issue of *Science & Education*, 2011, volume 20, 5–6). In particular, this means that the claims of religion fall somewhere on the spectrum, arguably nearer the bogus end. However, this means that they are subject to the usual criteria for deciding what is worth believing, which is, in any case, clear enough from the nature of the claims as we will note presently. The attempt to find a respectable domain for rational beliefs entirely outside of science is futile and invites Hume's (1777/1961) famous questions in his *Enquiry*:

> When we run over libraries, persuaded of these principles, what havoc must we make? If we take in our hand any volume; of divinity or school metaphysics, for instance; let us ask, *Does it contain any abstract reasoning concerning quantity or number?* No. *Does it contain any experimental reasoning concerning matter of fact and existence?* No. Commit it then to the flames: for it can contain nothing but sophistry and illusion (1777/1961, p. 165).

Of course, the problem for Ruse is that the claims that he wishes to endorse are plainly matters of fact and existence (although he also makes questionable analogies with "relations of ideas"). In that case, the Christian doctrines of interest fall within the realm of science, broadly conceived. It is noteworthy that in the 1981 Arkansas creationism court case, Ruse's (1988) expert testimony argued for a Popperian demarcation which would rule religious claims entirely out of bounds, although he now wishes to defend the belief-worthiness of propositions on the other side of the supposed line.[1]

2 Limitations of science

The difficulty for Ruse's central thesis is that the undoubted limitations on our science can provide no support for things admitted to be beyond these limits. For this reason, critics who charge the enterprise of science with inherent limitations always do so on behalf of doctrines that have nothing to recommend them to rational inquiry. Ruse emphasizes that science remains silent about some matters but this cannot provide comfort for Christian doctrines or any other such claims. The silence of science on an infinite number of propositions is not neutral or providing any license for them, as we understand when we think of propositions we have no inclination to believe. The mysteries of Zoroastrianism gain no credibility because science may not explicitly rule them out. Worse still, the propositions of religion are generally not like claims for some organism, planet or other object not yet discovered by science, but perfectly consistent with it. No one would bother

[1] See criticism by Laudan (1988)

to write books to emphasize the silence of science regarding an as-yet unknown species of insect. Even adopting an agnostic stance with regard to claims going beyond those warranted by our best science is not open-mindedness but credulity. We do not suspend judgement on the infinite number of unsupported or absurd propositions that can be conceived. The fact that some of these propositions may be dignified by cultural tradition is no recommendation, as we understand perfectly well when we think of traditions other than our own. The burden of proof is not symmetrical here in relation to claims avowedly beyond the bounds of science. Indeed, science is not silent even in those areas where it might have nothing explicit to say because these are *ipso facto* areas in which nothing is known. To profess consistency with science, as Ruse suggests, is empty because an infinite number of beliefs besides the cherished propositions of one's own system have the same credentials, that is, none.

3 Ways of Knowing

Perhaps the clearest symptom of the *incompatibility* of religion and science may be seen in the repeated effort to prove otherwise. Among scientists who have made such efforts, John Lennox of Oxford University recently offered the worst argument of all. He suggested that it is too "simplistic" to see a conflict between science and religion since "there are brilliant scientists who believe in God". Indeed, there are. However, it is a poor substitute for argument and evidence to cite the people who hold a favoured view. Arthur Koestler (1972) once listed all the Nobel Prize winners and Fellows of the Royal Society who believed in ESP, but if there were persuasive grounds, it would be unnecessary to cite the credentials of eminent believers. When we look at the actual arguments and evidence offered for religion by foremost scientists, we see something less persuasive than the science on which they rest their fame. 2010 Templeton Prize winner Francisco Ayala (2001) says that although "science has a lot to offer society" nevertheless, "I must say once more with no equivocation that I don't think it's the only way of knowing". As we will see presently, this is the formula that Ruse adopts too, but despite the air of open-mindedness, I will suggest that the case remains, at best, an empty anodyne. Another Templeton Prize winning scientist, Paul Davies, too, writes excellent popular science books, but his effort to make a case for God (Davies 1992) are no advance on illustrious historical antecedents such as Paley's famous Argument from Design. Worse still, Davies pretends that modern science can in some way provide new support for his theological doctrines, but this is not borne out by anything he writes (see Slezak 1996), and his preference for anthropomorphic conclusions from the fine-tuning of physical constants is not shared by other eminent scientists such as Einstein who are equally in awe of the mystery of the world's comprehensibility.

4 Incommunicable Insights?

We might expect better from philosophers. In his effort to find a place for religion alongside, or beyond, science, Ruse is undeniably in good company. Leading philosophers such as Alvin Plantinga, Peter van Inwagen, William Lane Craig and others have tried to reconcile Christian doctrines with those of secular science. Despite much technical apparatus and ingenuity, the results are disappointingly lame and their sophisticated writings serve as a smoke-screen for the most egregious propositions. For example, van

Inwagen (1994) defends his preference for Christian doctrines over the views of other leading philosophers such as David Lewis because he has an "incommunicable insight". I confess to having had a few incommunicable insights (mostly as a student smoking illicit substances). And, of course, psychiatric wards are full of people who profess unshakeable, incommunicable insights. The issues raised by faith of this kind are not only intellectual or psychological but ethical, as W. K. Clifford (1877/1999) argued in the 19th century in his article *Ethics of Belief*. He wrote "it is wrong always, and everywhere, and for anyone, to believe anything upon insufficient evidence". This truism would not seem to require defence if it were not so often violated and even denied. For example, in response to Clifford, William James (1896/1956) argued in defence of our "passional nature" and our "Will to Believe", but his position has the merit of acknowledging the irrationality of beliefs in this category. By contrast, van Inwagen avows essentially the naïve faith of my mother-in-law—a commitment to beliefs that are conveniently beyond criticism or the force of evidence. For a professional philosopher it is surely embarrassing to admit, in James' words, "reasoned argument is but a surface exhibition".

5 Naturalism and Metaphysical Choices

Plantinga (1991, 8) suggests that the question of the clash between faith and reason is "enormously difficult" requiring "penetrating grasp of the relevant theological and philosophical issues" as well as the complex science. However, this is sheer bluff since the arguments don't depend on any such arcane knowledge. Thus, citing Plantinga, Ruse (p. 183) seeks room for claims alongside and independent of science on the grounds that there are alternative "world views" and, therefore, a choice between two "metaphysical" options—naturalism and theism. The air of reasonableness and even profundity in this stance produces a vacant illusion of explanation but disguises sophistry. First, even if we are to talk this fancy philosophical way with Plantinga, it remains obscure why the Christian theistic "metaphysics" is the only alternative to the "naturalistic" one. One could presumably find or invent many others that would have equal status as alternatives to naturalism by virtue of having nothing to recommend them. Does Plantinga think that Mexican metaphysics based on the theology of Quetzalcoatl deserves equal consideration with his Christian variety?

The very idea that we can transcend what Ruse calls the "limitations of a science-based knowledge" (p. 10), or that we have a choice between alternative "metaphysics", is an illusion. There is no alternative to our best theories other than worse ones. Naturalism is just the picture provided by our current science and is, therefore, the best we've got. Pretentious philosophical talk of "metaphysical" options can't change the fact that naturalism is the only game in town since it is simply the totality of our theories in physics, chemistry, biology, neuroscience, geology and so on. Does Christian metaphysics provide a better account of quantum physics, cosmology or the structure of DNA?

6 Metaphors

Craig is more explicit than Ruse in using the term "metaphysical" to insinuate claims that have nothing to recommend them besides scriptural faith. Ruse is less direct and, to that extent, more elusive, emphasizing the suggestive pictures that have informed the development of scientific theories. Thus, Chapter One is devoted to the metaphor of "world-as-organism" and Chapter Two concerns the metaphor of "world-as-machine".

> With hindsight, we can easily see how science had made the move from the organic metaphor to the machine metaphor. We have a switch in root metaphors. We have left the self-regenerating world, where everything is referred to ends, and we are now in a world of particles—atoms, corpuscles—endlessly moving in space—mindlessly, as one might say (p. 45).

However, there is a lesson from the history of science that Ruse neglects. His account of shifting metaphors makes it sound a little as though we trade one arbitrary form of poetry for another, but of course, we also find out new things and discover we were mistaken about others. Even if the underlying idea of a cosmic machine may have originally been a metaphor for Osiander and Bellarmine, it's harder to regard the heliocentric theory today in this way. Whatever may be the heuristic role of metaphors in science, it remains that we are generally in no doubt about which parts are to be taken as literal descriptions of the world, even if these are later discarded. Even if we accept some version of this instrumentalist view of theories as metaphors, it hardly adds any weight to theories entirely unfounded by the usual considerations. The long-standing debate about realism and the "pessimistic meta-induction" from the history of science have no bearing on Ruse's central thesis. That is, anti-realism gives no comfort to doctrines that have no support based on evidence, explanatory comprehensiveness, elegance, parsimony and so on. Appeal to history of science is not only the basis for philosophers' "pessimistic meta-induction" but also the gambit of naïve purveyors of the paranormal: Whereas anti-realists claim that our best theories might be false, psychics claim that our worst theories could be true.

7 Instrumentalism

Ruse approaches his theme of the "limitations of a science-based knowledge" (p. 10) through the history of science and, therefore, the overwhelming bulk of the book is an exposition of key ideas in the emergence of modern scientific theories of the world, organisms and the mind. In his characteristic expository style, Ruse gives an excellent overview of the theories in these areas of inquiry, but his history is avowedly a selective one intended to serve a special philosophical purpose. Throughout, there is a subtle *leit-motif* concerning the "nature of science generally" that prepares the ground for Ruse's metaphysical, religious thesis:

> What I am saying is that science is a dance, an interplay between the given and the found, the subjective and the objective, the mind-directing and the directed-mind.
>
> This softens the way for an even more important point. Scientists try to build models; they try to provide pictures of the way things might be. Then they go out to see how their models fare when they are tested against the empirical world. To do this, they do above all what comes naturally in human thinking, they provide and use metaphors (p. 20, 21).

There is no doubt that metaphors and models are central to scientific discovery and explanation. However, Ruse defends the stronger claim that

> Strictly speaking, they are false. They are not literal descriptions of reality. They are ways of looking at reality that give or yield great insights (p. 118).

This is a kind of instrumentalism—the doctrine that scientific explanations are convenient fictions. Ruse's position bears a similarity to Craig's stance when the science seems to require unwelcome conclusions from a religious point of view. When the mathematics of Big Bang cosmology seems to contradict Christian doctrine, Craig resorts to instrumentalism in order to insinuate theories that go beyond the warrant of our best science.

> I can only regard cosmological models based on a metaphysic of superspace as mathematical constructs having no correspondence with reality (Craig 1993, p. 159).
>
> Simply because a mathematical model is operationally successful, we are not entitled to construe its representations physically. … One can use the equations without taking them as literal representations of reality (Craig 1990, p. 481).

Instrumentalism has illustrious defenders such as van Fraassen (1980) but it is irrelevant in the present context because it can have no bearing on the merits of specific, substantive conjectures. Whether or not the Higgs Boson exists remains open, but it is not resolved by taking a stand on the realism-instrumentalism dispute. Ditto for God. Even if instrumentalism is preferred as a philosophical view of theories, not all fictions are equal.

Thus, for Ruse to say that theories as metaphorical are "strictly speaking" false is a bit mischievous by insinuating a lack of warrant that does not follow from any thesis about metaphors, models and realism. The merit of the claim that water is H_2O is not diminished by such doctrines, just as religious claims are not thereby strengthened. Unsupported theories are not improved in their standing just because our best theories are held tentatively, perhaps even as metaphors.

8 Magisteria

On the face of it, Ruse would seem to be advocating a key lesson from the Galileo affair, namely, that the conflict between science and religion may be avoided because, Ruse (p. 8) says, "traditional Christianity has always insisted that truth cannot be opposed to truth". Galileo's famous 1615 *Letter to Grand Duchess Christina* argued persuasively that we need not see matters of 'faith and morals' in conflict with science. Stephen J. Gould (1999) makes such an attempt, with his doctrine of Non-Overlapping Magisteria (NOMA), memorably captured in Galileo's quote from Cardinal Cesare Baronio, "the intention of the Holy Spirit is to teach us how one goes to heaven and not how heaven goes".[2] Essentially the same point was, of course, made in David Hume's *Treatise* in his famous distinction between 'is' and 'ought': Facts can never entail values. Of course, if the empirical findings of science can provide no moral, evaluative principles, this leaves open the question of their foundation. Here, indeed, religion makes claims that deserve scrutiny but these will conflict with science only to the extent that the claims rest on empirical grounds regarding the existence and attributes of God. Ruse (p. 130) agrees with Hume and quotes his famous passage in which he claims to "subvert all the vulgar systems of morality" by showing "that the distinction of vice and virtue is not founded merely on the relations of objects, nor is perceived by reason".

However, Ruse is not happy with confining religious claims to the realm of morality and value. Ruse joins Gould in rejecting the "warfare" thesis embraced by many advocates of science, but Ruse expresses his residual disagreement with mild sarcasm: He protests that, although Gould "supposedly defended the integrity of religion in the face of science" (p. 5), in fact, he was merely "an illusionist", relegating religious claims to the sphere of

[2] Recently, Finocchiaro (2010) asserts that Galileo was "basically correct" in holding the principle but I have suggested (Slezak 2011) that Finocchiaro's justification begs the question concerning the *standards* that are relevant in making such an evaluation. It may be largely to Galileo's credit that we mostly accept this principle today, but Galileo's misfortune was trying to establish a principle when it was, *ipso facto*, not yet accepted even among the most eminent scientists such as Clavius. Subsequent vindication by the Church itself by Pope Leo XIII's *Providentissimus Deus* (1893) and Pope John Paul II's 1992 address to the Pontifical Academy of Science, does not alter the fundamental point that the standards themselves shift with a scientific revolution as Kuhn (1962) noted.

morality while maintaining that important questions about the universe belong to the domain of science. In other words, Ruse wants affirmative action for religious claims because he thinks they deserve to be accorded cognitive significance beyond the realm of values. In these differences with Gould, Ruse shows his hand, departing from Galileo too, rejecting the picture of human existence as a cosmic and biological accident having no higher purpose. Of course, even the Catholic Church has come to accept Galileo's position in his *Letter to Christina* but Ruse would evidently retract Galileo's *Letter* and have the Church rescind Pope Leo XIII's encyclical *Providentissimus Deus* of 1893.

9 Different Source?

Ruse does not wish to make the general, bland claim that religion in some inclusive, universal sense may be reconciled with science. Rather, Ruse identifies four specific claims that are constitutive of being a Christian:

1. There is a God who is creator.
2. Humans have duties, moral tasks here in earth on which we will be judged.

3a. Jesus Christ came to earth and suffered because we humans are special.

3b. We have souls.

4. There is the promise of everlasting life in heaven.

Ruse makes the bold assertion,

> I want to show that you can hold these, if you so wish, in the light of modern science—if you prefer, in the face of modern science. In other words, the Christian's claims are not refuted by modern science—or indeed threatened or made less probable by modern science (p. 182).

Following Plantinga, Ruse (p. 183) defends these claims on the grounds that Christianity asks different questions and looks for answers in a quite different direction than that of science. Moreover, forestalling Positivist dismissiveness, he insists that the questions are genuine questions falling into "certain areas that modern science not only does not answer but, as it is at the moment, does not even speak to" (p. 182).

> … the Christian claims to be giving a faith-based answer, one that comes from a different source than the reason and empirical experience (through the senses) that yields science (p. 183).

What other source? Ruse doesn't say. Indeed, Ruse (p. 183) suggests that making the usual rational, scientific demands on Christian claims is unfair because "it is open for others to attempt answers to these questions [about ultimate origins etc.]" but "these must be answers of a different type in some way: non-scientific answers". It is difficult to see that Ruse offers anything more persuasive than van Inwagen's assertion that Christians have incommunicable, self-certifying insights, though he does speculate whether mathematical intuition might be analogous to Christian faith (p. 193). Apart from the intrinsic difficulties with this view, there is also the obvious question of how people with contrary insights might settle, or even discuss, their differences, especially in light of Ruse's suggestion that "In a sense, therefore, faith is akin to reason in the sense that it leads to truths of the same logical type" (p. 183).

10 Ruse's Ruse

In relation to Davies (1992), I suggested (Slezak 1996) it is a highly suspect idea that we might meaningfully go beyond what our best science itself can certify. The appropriate

humility would refuse to even ask questions which are not supported by our science. In his *Tractatus*, Wittgenstein famously addressed the question of limits of scientific knowledge that is the theme of Ruse's book. He wrote "Whereof one cannot speak, thereof one should remain silent".

However, notwithstanding his metaphysical temptations, the tenets essential to Christianity seem to be eminently empirical claims. Why should the existence of God be different from the existence of Dark Matter or the Higgs Boson and immune to the usual standards of rational belief? How can claims about the existence of souls or heaven be anything other than an empirical claim of the ordinary kind? Ruse wishes to turn the tables by suggesting that such claims have *better* credentials precisely because they fall outside the domain of rational belief. However, Ruse's speculation that God is eternal and, therefore, "like the truths of mathematics" (p. 188) is very hard to take seriously, especially if one is a Christian. A god that is like $2 + 2 = 4$ (p. 121) hardly seems to provide grounds for the central tenets of Christian faith concerning souls, afterlife and redemption. Falling outside the domain of science does not insulate the claims of Christianity from science as Ruse hopes in seeking "to make room for it in the face of science" (p. 193). Christianity loses any claim to our assent precisely by becoming indistinguishable from all the other conceivable doctrines that have the same status.

11 Miracles

The central difficulty with Ruse's central thesis is illustrated clearly in his treatment of miracles (p. 207). He suggests "The Christian miracles are not trying to do the work of science at all. They are about something entirely different, and they are simply laid across the world of science". It's not clear exactly what this means, but Ruse suggests that even trying to give evidence or proof of miracles "gets you into the domain of science, and that is a sucker's game" (p. 207). Evidently, one such sucker must be David Hume whose argument against belief in miracles remains cogent as a matter of weighing evidence and making judgements of plausibility or, in other words, doing science. Instead, Ruse suggests "Better simply to accept the miracles on faith and leave it at that" (p. 207). If that were all, one might leave it at that, but Ruse goes further to claim that the Catholic miracle of transubstantiation "is something not open to empirical check or refutation" (p. 207). Hume and Ruse's readers deserve a better answer.

12 Before the Big Bang?

We see the inadequacy of Ruse's effort to quarantine Christian beliefs from science where he professes to finding it "deeply meaningful" to ask the "Primordial Existential Question": Why is there something rather than nothing? (p. 120) But even if we accept Ruse's avowal, it's not clear how this can provide warrant for any of the specific claims of Christianity. None of the central tenets cited by Ruse follow from this question, and Ruse goes significantly beyond professing to understanding this puzzling question to offering speculations that are not as independent of modern science as he evidently thinks.

That is, although Ruse's central thesis concerns the transcendence of religious claims beyond the domain of rational science, not only the specific Christian doctrines are squarely in the realm of empirical assertions. Ruse (p. 120) uses the limitations of the machine metaphor as his excuse for slipping substantive scientific claims in while

pretending, at the same time, that they are beyond science altogether. For example, his case for a First Cause is neither beyond the realm of science nor something on which science remains silent:

> We can certainly take the causal chain back to the Big Bang. … For myself, I am hesitant to stop there. I don't really see why there should not be something earlier … (p. 120).

However, the reason why there should not be something earlier is not a matter of naïve intuition. Although Ruse may be hesitant to "stop there" at the Big Bang, the reason to do so is a matter of theoretical physics. Or, alternatively, if there are grounds for going back "earlier" it is also a matter of theoretical physics. Quentin Smith (1993) and Grünbaum (1989) have drawn attention to the illegitimacy of talking about causes or other events prior to the big bang. As Grünbaum (1989) and Smith (1993) have noted, the concept of a cause itself is illegitimately extrapolated from the familiar notions of event and agent causation in the world to serve as explanation of the origin of the entire universe. This is, at the very least, an extension which requires defence, since it is not simply the unproblematic application of the ordinary notion of cause as it may appear. That is, the problem of the cause of the entire universe is not the same as the problem of the cause of any other event. Ruse pays no attention to these subtle but essential questions perhaps on the naïve grounds that science has nothing to say about them. First, as Grünbaum (1989, p. 379) notes, even if one could legitimately posit an external cause of the entire universe, it by no means follows that such a cause must be the intentions of any being as Ruse intimates. The temptation to postulate causes of this kind is the sort of anthropomorphism that Einstein derided. Second, and more fundamental, ordinary agent causation involves only the *transformation* of matter-energy and not its creation 'ex nihilo'. Thus, the kind of cause being supposed to explain the origin of the universe is quite different from its everyday counterpart.

Ruse suggests "our history gives us a very good reason why it [a First Cause] is not a subject for science" (p. 121). He offers the "traditional answer" to explain the cause of the "whole kit and caboodle" as "outside time", but this is hardly a subject on which modern science has nothing to say. Ruse makes the same gambit as Davies (1992, p. 58) who suggests with apparent equanimity that "if one insists on a reason for the big bang, then this reason must lie beyond physics". However, there can be no rational appeal "beyond physics" which is, in any case, to make a substantive scientific claim. The illegitimacy of supposing an external cause of the universe is essentially the difficulty posed by *any* claims which go beyond what is strictly warranted by our best available scientific theories. This difficulty confronts the very notion of a Creator of the universe who was responsible for the Big Bang since there was not only no matter, but no time before the Big Bang either. However difficult to comprehend in an intuitive sense, modern cosmological theories assert that the universe began to exist over twelve billion years ago out of literally nothing, without being caused to do so. Smith (1993) explains that the singularity is not even an event, that is, a point in 4-dimensional space–time. Rather it must be understood, not as a part of, but as a boundary or edge of, the four-dimensional space–time continuum. Craig and Sinclair (2009, p. 186) have parodied Smith's account as "a sort of Gettysburg address of atheism": Smith sums up the apparent implications of modern Big Bang cosmology saying "the most reasonable belief is that we came from nothing, by nothing, and for nothing" (Smith, 1993, p. 135).

Despite the fact that our best explanatory theories exclude causes of the Big Bang because there was no space or time "before" the singularity, in the face of the undeniable bizarreness of the claims, Craig (1993) describes such conclusions as "metaphysically problematic" and "metaphysical nonsense" (1993, 156). However, it will not do to mystify

by referring to "ultimate questions" and "metaphysics" since these are empty labels without further explanation. For the reasons indicated, modern physics is not *silent* about causes of the universe prior to the Big Bang as Ruse suggests. As we have just noted, questions such as 'what happened before t = 0?' or 'What caused the big bang? are based on assumptions which are denied by the model to which these questions are being posed. If Ruse wishes to pose such questions, he is entitled to reject the physical models in question by giving theoretically good reasons for postulating the existence of causes and times before t = 0. But, it is not possible to take the physics to be correct and, at the same time, to complain that the model fails to answer the questions which it actually rules out as illegitimate. Ruse clearly wants to have it both ways.

13 True Religiosity

Einstein spoke of the sentiments that "constitute true religiosity" as "the awareness and a glimpse of the marvellous structure of the existing world". These views do not seek to go beyond the apprehension of an order in the world or even beyond our sense of mystery to anything else transcendent. Elsewhere, Einstein explained that the attitude which he took to be religious "in the highest sense of the word" was derived from the experience of science itself for someone who "is moved by profound reverence for the rationality made manifest in existence". Einstein addressed himself explicitly to Ruse's motivation for belief in a transcendent being, arguing on the contrary:

> The more a man is imbued with the ordered regularity of all events the firmer becomes his conviction that there is no room left by the side of this ordered regularity for causes of a different nature. For him neither the rule of human nor the rule of divine will exist as an independent cause of natural events (1954, p. 28).

Einstein is expressing a view which Russell (1961) called "A Free Man's Worship"—the reverence of an atheist based on science. There is, after all, a sense in which religious doctrines are incompatible with science. Even where such propositions are not directly contradicted by scientific claims, belief in them is profoundly irrational because they are unfounded. For this reason, it is no virtue that the "central core claims" of Christianity "by their very nature go beyond the reach of science" as Ruse suggests. He concludes,

> I do not say that you must be a Christian, but I do say that in the light of modern science you can be a Christian. We have seen no sound arguments to the contrary (p. 233).

However, the sound arguments to the contrary may be found in Hume's *Enquiry*:

> … in matters of religion, whatever is different is contrary; and … it is impossible the religions of ancient Rome, of Turkey, of Siam, and of China should, all of them, be established on any solid foundation (1777/1961, p. 121).

Ruse's own ecumenicalism or compatibilism backfires because on his own account, even if it were sustainable, we may assert "I do not say that you must be a Zoroastrian, but I do say that in the light of modern science you can be a Zoroastrian". Ditto for every other religion.

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