

Evolution in Court A Federal Judge Defines Science

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Abstract. This article highlights certain recurring themes in Mariano Artigas's works by examining a judicial decision made in the United States in 1982 concerning the teaching of "creation-science" alongside "evolution-science" in public schools. These themes include: the proper delimitation of the boundaries of science, the importance of philosophy as a bridge between science and religion, and the misunderstandings concerning the limits of science inherent in scientism.

Keywords: creation-science; falsifiability; philosophy as bridge; scientism.

Introduction

Can a judge define what science is? Faced with a case in which he had to adjudicate whether creation science is science, U.S. District Court Judge William R. Overton was obliged to do just that. Obviously, as judge, Overton did not possess the requisite philosophical competence. However, he was able to listen to a host of prominent scientists speaking about their discipline. They were asked about the nature of their work: what is science, how it is done, and how it differs from religion. Consequently, Judge Overton's

ten-page decision¹ includes accounts of the nature of both science and religion and their interrelation, accounts Mariano Artigas deemed worthy of investigation.²

Judge Overton's ruling concerned a challenge to Act 590, which the Governor of Arkansas had signed into law in 1981, entitled "Balanced treatment for Creation-Science and Evolution-Science Act." Its essential mandate is stated in its first sentence: "Public schools within this State shall give balanced treatment to creation-science and to evolution-science" (Overton 1982, 934). Act 590 required that scientific evidence that supports the view that each species was created by God *ex nihilo* be provided alongside scientific evidence that supports evolution, *i.e.*, the notion that new species arose from previously existing species.

Behind this "balanced treatment" is the idea that there is no way to accord the Biblical account of creation with evolution. But many people, scientists and religious believers alike, reject this view. In fact, the trial was named *McLean versus the Arkansas Board of Education* because the first name in the list of plaintiffs who objected to the Arkansas Act was Reverend Bill McLean, a Presbyterian minister. Various Christian churches were also included among the many plaintiffs.

In order to determine what science is, and how it differs from religion, Judge Overton had to hear the testimony of several qualified scientists, who acted in the capacity of expert witnesses. Among them were Francisco Ayala, professor of the University of California, and Stephen Jay Gould, a paleontologist of Harvard University, who was already well known as co-author (with Niles Eldredge) of the theory of punctuated equilibrium.

Act 590 relied upon quite elaborate definitions of "creation-science" and "evolution-science"—whence the need for expert witnesses in the McLean

¹ Overton's decision, was favorably viewed by scientists, and was even reproduced in its entirety in *Science*, the official magazine of the American Association for the Advancement of Science: "Creationism in Schools: The Decision in McLean versus the Arkansas Board of Education."

² This article is drawn in part from what was to be the first chapter in a book that Dr. Artigas and I were collaborating on in 2004. The book, which was never completed, was tentatively entitled "Science and Religion: A Plea for Consonance."

trial. For example, the Act maintained that evolution-science typically affirms “the sufficiency of mutation and natural selection in bringing about development of present living kinds from simple earlier kinds” (Overton 1982, 937). The McLean sentence was able to reject this view relying on the expertise of Ayala and Gould, “both [of whom] stated that biologists know that these processes do not account for all significant evolutionary change. They testified to such phenomena as recombination, the founder effect, genetic drift and the theory of punctuated equilibrium, which are believed to play important evolutionary roles” (Overton 1982, 938).

Throughout Gould’s pre-trial deposition, the attorney representing the Arkansas board of education, David L. Williams, uses the typical tricks of the lawyer in hopes of taking Gould by surprise. His attempts to land Gould in a contradiction or to extract from him some concession to the creationists’ claim elicit from Gould some judicious answers to questions concerning science and religion. A case in point is when Williams interrogates Gould concerning the limits of science:

Q. Do you feel that we know all that there is to know about the natural law?

A. Goodness, if we knew everything that there was about the world I guess we would pack up and play golf for the rest of our lives.

Q. So there is more to learn?

A. By definition in science, there is always more to learn. What a dull world if there weren’t.

Q. Do you think that it would be scientific for a scientist to look at the origin of life or some organism and try to determine whether the origination of that life or organism was possible under the laws of nature?

A. Science, like any other enterprise, has boundaries. Science is that enterprise that attempts to describe and interpret the facts of the world under natural law, therefore attempts to study the origins of things under the laws of nature...

Q. So the study of the limits of the laws of nature would be part of science?

A. The limits are not—the limits are not—limits have to do more with definitions of the enterprise, not with the facts of nature. Therefore, nothing about morality is part of science. Natural law doesn’t deal with morality. But anything about the facts of nature come under the heading of natural law as we understand it.

Q. What was the last statement? I didn't hear it.

A. That the fact of nature as we understand it comes under the province of natural law.

Q. You use the term as we understand it.

A. Science is always tentative. ("Deposition of Dr. Stephen Jay Gould" 1981, 26)

Later in the deposition, Mr. Williams began to ask Gould about Karl Popper's views:

Q. Are you aware that Popper in his autobiography, which is entitled "Unended Quest", says, "I have come to the conclusion that Darwinism is not a testable scientific theory, but a metaphysical research program—a possible framework for testable scientific theories?"

A. Are you aware that he has modified that view since then?... That he now regards it as testable ("Deposition of Dr. Stephen Jay Gould" 1981, 43–44).

Williams knew that Karl Popper, one of the most influential philosophers of science in the 20th century, had expended a great deal of effort to determine what should qualify as science. Williams sought to exploit Popper's highly controversial declarations on the scientific status of evolutionary theory as a means of eliciting from Gould a response that would aid the cause of creation-science.

Popper never proposed a full characterization of science, something which is a very difficult task. He concentrated on the minimum that we should require for something to qualify as science, and proposed *falsifiability* as the criterion of demarcation between science and non-science. A theory is to be considered scientific only if we can deduce from it some consequences that can be *falsified*, *i.e.* that may collide with empirical data. If we say, "It will rain here tomorrow," we can wait and find out later whether this prediction was true or false. Therefore, this prediction is falsifiable, and could form part of a scientific theory. Pseudo-science, on the other hand, claims the status of science, but proposes theories that cannot be falsified.

Even though Popper was an agnostic, he did not deny the validity of metaphysics or religion as knowledge; he only argued that they are not a part

of empirical science. Falsifiability allowed Popper to distinguish empirical science from pseudo-science on the one hand, and from metaphysics on the other. He regarded the demarcation of science to be a central problem in the modern world, given the prestige of empirical science. His intent was to fight pseudo-science, not metaphysics or religion. Pseudo-science presents itself as science and does not meet the requirement of falsifiability, whereas metaphysics or religion does not usually claim the status of science, at least not in the sense of empirical science.

If a theory is falsifiable, it may end up being falsified. In that case it should be abandoned or, at least, modified. Popper concluded that there are no definitive conclusions in empirical science. Nothing is sacred. Everything should be open to criticism. Scientific knowledge is always provisional. It can always be rejected, modified, fine-tuned.

Even though many philosophers of science agreed with the above views, Popper is the one to be credited for putting these ideas in the limelight. Popper considered himself an agnostic and an evolutionist, and established a close parallel between his theory of knowledge and evolution. No wonder, then, that some people became confused and even alarmed when, in his autobiography published in 1974, he claimed that Darwinism was not falsifiable. This was not a remark made in passing; Popper developed this theme at length in a section entitled “Darwinism as a Metaphysical Research Programme:” “I have come to the conclusion that Darwinism is not a testable scientific theory, but a *metaphysical research programme*—a possible framework for testable scientific theories” (Popper 1993, 168).

This was the point that interested Mr. Williams. If no less an evolutionist and philosopher of science than Popper considered Darwinism to be metaphysics, rather than science, this provided ammunition to the creationists, who tried by all means to discredit evolution’s status as science.

Popper continued to reflect on the status of Darwinism, and he eventually came to change his view. He openly recanted in the first Darwin lecture, delivered at Darwin College, Cambridge, on November 8, 1977. In the second section of the lecture, entitled “Natural Selection and its Scientific Status,” Popper says that: “Darwin’s own most important contribution to the theory

of evolution, his theory of natural selection, is difficult to test” (Popper 1987, 143). And he comments that this has led some people to claim that Darwinism could be considered a tautology, even though, at the same time, it has great explanatory power, which seems a contradiction (Popper lists as proponents of this position great Darwinians, such as, Ronald Fisher, J. B. S. Haldane, and George Gaylord Simpson). His further remarks on the tautology issue lead into his retraction of the view that Darwinism is not falsifiable, and thus not science:

I mention this problem because I too belong among the culprits. Influenced by what these authorities say, I have in the past described the theory as “almost tautological”, and I have tried to explain how the theory of natural selection could be untestable (as is a tautology) and yet of great scientific interest. My solution was that the doctrine of natural selection is a most successful metaphysical research program. It raises detailed problems in many fields, and it tells us what we would expect of an acceptable solution of those problems.

I still believe that natural selection works in this way as a research program. Nevertheless, I have changed my mind about the testability and the logical status of the theory of natural selection; and I am glad to have an opportunity to make a recantation. My recantation may, I hope, contribute a little to the understanding of the status of natural selection. (Popper 1987, 144)

The details concerning Popper’s change of view would carry us too far from our main point here,³ which is that it is not always easy to neatly determine what is testable and what is not testable, and therefore what belongs to the province of empirical science and what remains outside it. The latter explains

³ To ascertain whether Popper was justified in changing his view on the falsifiability of natural selection, one would have to determine how Popper understood natural selection and whether his understanding was correct; and then one would have to examine his solution of the tautology problem (“organisms that survive are the fittest, while the fittest are the organisms that survive”). I note briefly that Popper maintained that natural selection was falsifiable because it was in fact falsified (as being universal) in cases of features arising from sexual selection, such as the male peacock’s tail. However, some maintain that sexual selection is a subcategory of nature selection, and some authors, unpersuaded by Popper’s defense of natural selection in face of the tautology problem, propose a different defense of it (see Stamos 1996, 170).

why Mr. Williams could continue to press Gould on different aspects of the problem. Scientific theories often include concepts that can be empirically tested only in a very indirect way. Consider, for example, the principle of special relativity, which posits that all the laws of physics must have the same form when expressed in systems of reference that are inertial. In some way this expresses a fact of experience, namely, that we can walk on a ship as if we were on land (provided the ship's movement is uniformly constant and along a straight line). But when we apply the principle to the laws of physics in general it leads to quite complex formulations that can only be tested very indirectly through some of their consequences.

1. A Definition of Science

Judge Overton did not let difficulties in the application of the criterion to be used to distinguish empirical science from other forms of knowledge prevent him from arriving at a definition of empirical science. After hearing a number of distinguished scientists, historians of science, philosophers of science, and theologians, Overton concluded that the essential characteristics of science are:

- (1) It is guided by natural law;
- (2) It has to be explanatory by reference to natural law;
- (3) It is testable against the empirical world;
- (4) Its conclusions are tentative, *i.e.*, are not necessarily the final word; and
- (5) It is falsifiable. (Overton 1982, 938)

Characteristics (1) and (2) distinguish science from explanations which refer to a personal God who is the author of natural law. Characteristic (3) distinguishes science from philosophy as well as from religion, for although philosophy must take into account the empirical world, it, unlike science, produces explanations that are not testable against the empirical world through experiments. Characteristic (5) is a Popperian variant of (3). Characteristic (4) is a consequence of the empirical method of testing hypotheses against the empirical world; from a logical perspective, application

of this method will never result in a completely final answer. For this form of the hypothetical syllogism is invalid, *i.e.*, its conclusion does not follow of necessity: “If A, then B; B, therefore A.” For, if B is shown to be true, it is not the case that A necessarily follows. For example, if it rains the ground is wet; but the fact the ground is wet does not prove that it has rained (some other cause may account for it, *e.g.*, someone may have watered it). Yet this is the manner in which scientists reason: If hypothesis X is true, then such and such consequences will follow. Scientists then do repeated experiments to find out if such and such consequences do in fact follow. However, even if they do follow, the consequences do not prove that the hypothesis is true; given the logic of the situation, the most they can do is “corroborate” or strengthen the likelihood that the hypothesis is true.

To understand Overton’s application of the criteria for science to the Act we need to first look at the definitions that were used in the Act:

Creation-science includes the scientific evidences and related inferences that indicate: (1) Sudden creation of the universe, energy, and life from nothing; (2) The insufficiency of mutation and natural selection in bringing about the development of all living kinds from a single organism; (3) Changes only within fixed limits of originally created kinds of plants and animals; (4) Separate ancestry for man and apes; (5) Explanation of the earth’s geology by catastrophism, including the occurrence of a worldwide flood; and (6) A relatively recent inception of the earth and living kinds. (Overton1982, 937)

Why did Overton, upon applying the above definition of science to creation-science as described above, conclude that it was not science? First of all, a sudden creation “from nothing” is not a scientific concept, “because it depends upon a supernatural intervention which is not guided by natural law” (Overton 1982, 938). This, of course, is a fair point.

Overton further concludes that creation science fails to qualify as science because, “it is not explanatory by reference to natural law, is not testable and is not falsifiable.” However, aside from the claim about creation *ex nihilo*, this statement is inaccurate. As noted above, the second claim about the sufficiency of mutation and natural selection has already been rejected on

scientific grounds. Also, one can look at fossil and other evidence to verify or falsify the limits of changes of organisms and whether humans have a separate ancestry from other organisms. Similarly, evidence is available to test geological hypotheses concerning the earth's formation, as well as to test the reliability of different forms of dating. On these matters creation-scientists may be wrong, but they are doing science. In some cases, their objections to the theory of evolution are the same evidence-based objections that Darwin himself entertained, such as how the Cambrian explosion is compatible with the Darwinian theory.⁴ Such evidence-based objections are often swept under the carpet. But to insist that they be mentioned is simply to ask that science be properly taught. There is no need for some other form of science instruction.

Overton rightly observes that creation-science fails to meet the criterion of being tentative:

The methodology employed by creationists is another factor which is indicative that their work is not science. A scientific theory must be tentative and always subject to revision or abandonment in light of facts that are inconsistent with, or falsify, the theory. A theory that is by its own terms dogmatic, absolutist, and never subject to revision is not a scientific theory... The Court would never criticize or discredit any person's testimony based on his or her religious beliefs. While anybody is free to approach a scientific inquiry in any fashion they choose, they cannot properly describe the methodology used as scientific, if they start with a conclusion and refuse to change it regardless of the evidence developed during the course of the investigation. (Overton 1982, 939)

Note, however, that this criticism cuts both ways: those arguing in favor of evolution need to also consider the evidence against it, if they are doing science.

At this juncture it is pertinent to speak about a theme important in Artigas's work, namely, the role of philosophy as a bridge between science

⁴ See Darwin 1964, c. 10, "On the Imperfection of the Geological Record," subsections, "On the sudden appearance of groups of species" and "On their sudden appearance in the lowest known fossiliferous strata."

and religion.⁵ Creation-science as defined above includes “scientific evidence and related inferences that indicate” creation *ex nihilo*. While it does not belong to science as such to address creation, the philosophical question of whether or not scientific knowledge has any bearing on this matter is never raised. Here is not the place to embark upon a full treatment of this question, though we can readily note that to the extent that scientific knowledge is tentative and subject to revision, it plainly is incapable of indicating anything further with certitude. However, neglect of this question and other related philosophical questions was at the root of the misguided efforts of the authors of Act 590. Rather than petitioning that students be taught “creation-science” in the biology classroom, the authors of Act 590 would have done better to insist that students take a basic philosophy course in which they would receive instruction as to the relationship between science and religion. Such a course would clarify the limits of science. Such a course—assuming competent instructors—would make students aware that biology teachers have no business portraying scientific teachings concerning evolution as establishing that blind causes alone explain the diversity of life forms (thus undermining the notion of a creator God). In effect such teachers are using science as a platform on which to erect a materialist philosophy without actually addressing the philosophical issues involved.

Philosophy does not offer an entire solution to the atheism explicitly or implicitly disseminated by a certain number of biology teachers, however, insofar as scientific evidence that new species have originated from previously existing species is in conflict with the position that the apparition of all living species is *ex nihilo*.⁶ A “literalist” reading of Genesis concerning the

⁵ See Artigas 2000, 12: “if I stress that a methodological gap exists between empirical science and the questions about transcendence, I do not do so for my own convenience or to prevent the abuses of materialism and naturalism. The gap really exists. Since this is the case, to bridge it we will need to use intellectual tools, which must include elements common to the opposite sides of the bridge. This task cannot be accomplished by empirical science alone. I argue, instead, that it can be accomplished by philosophy.”

⁶ While space does not allow us to take up questions of the relationship between science and religion, I offer this text for reflection drawn from Pope Leo XIII’s encyclical *Providentissimus Deus* (1893). Leo XIII begins by quoting Aquinas: “When philosophers are agreed upon a point, and it is not contrary to our faith, it is safer, in my opinion, neither to

origin of all species is in fact incompatible with evolution. It is theology's business to determine the manner in which scripture is to be interpreted.

2. The Conflict Thesis

Many people would be in overall agreement with Gould and Overton's main views on science and creationism. But the McLean trial raises a very simple question: Why has it taken so long to understand that science and religion are two different domains? How did it come to such a strange impasse that a court judge was called upon to pronounce a verdict on this issue?

The truth is that portraying the relationship between science and religion as a perpetual conflict has been fashionable for a long time. Echoes of this idea can be found even in scientific publications that are usually objective. For instance, the column *Skeptic* in *Scientific American* (September 2004) is devoted to the difficult issue of body and soul, and there the contributing editor, Michael Shermer, writes: "Is scientific monism in conflict with religious dualism? Yes, it is. Either the soul survives death or it does not, and there is no scientific evidence that it does" (Shermer 2004, 24). But empirical science cannot say anything about spiritual realities, either pro or con.

Colin A. Russell, in a fine article on the conflict thesis, reminds us that the considerable literature on the subject commenced with two famous books published in the last decades of the nineteenth century: John William Draper's *History of the Conflict between Religion and Science* (1874), and Andrew Dickson White's *A History of the Warfare of Science with Theology in Christendom* (1896). Both were repeatedly reprinted and widely circulated, apparently sometimes even in free versions paid for by people who intended

lay down such a point as a dogma of faith, even though it is perhaps so presented by the philosophers, nor to reject it as against faith, lest we thus give to the wise of this world an occasion of despising the faith." And continues: "The Catholic interpreter, although he should show that those facts of natural science which investigators affirm to be now quite certain are not contrary to the Scripture rightly explained, must, nevertheless, always bear in mind, that much which has been held and proved as certain has afterwards been called in question and rejected. And if writers on physics travel outside the boundaries of their own branch, and carry their erroneous teaching into the domain of philosophy, let them be handed over to the philosophers for refutation" (no. 19).

to enlighten the ignorant. As a result: “For nearly a century, the notion of mutual hostility (the Draper-White thesis) has been routinely employed in popular-science writing, by the media, and in a few older histories of science. Deeply embedded in the culture of the West, it has been proven extremely hard to dislodge” (Russell 2002, 4).

According to Russell, “the conflict thesis, at least in its simple form, is now widely perceived as a wholly inadequate framework within which to construct a sensitive and realistic historiography of Western science” (Russell 2002, 5). There are at least six notable deficiencies in the conflict thesis:

The shortcomings of the conflict thesis arise from a multiplicity of reasons, some of which can be briefly summarized as follows. First, the conflict thesis hinders the recognition of other relationships between science and religion. At different phases of their history, science and religion were not so much at war as largely independent, mutually encouraging, or even symbiotic...

Second, and more specific, the conflict thesis ignores the many documented examples of science and religion operating in close alliance...

Third, the conflict thesis enshrines a flawed view of history in which “progress” or (in this case) “victory” has been portrayed as inevitable...

Fourth, the conflict thesis obscures the rich diversity of ideas in both science and religion. Neither of these has ever been monolithic, and there was seldom a unified reaction from either...

Fifth, the conflict thesis engenders a distorted view of disputes resulting from causes other than those of religion versus science...

Finally, the conflict thesis exalts minor squabbles, or even differences of opinion, to the status of major conflicts. (Russell 2002, 7–9)

Another contemporary author critical of the conflict thesis, David B. Wilson, examines it from the perspective of the historiography of science and religion. Wilson shows, for instance, that this thesis was completely absent in the work of William Whewell (1794–1866). Whewell was the most prominent historian of science during the first half of the nineteenth century, in addition to being a philosopher of science, a mathematical physicist, and an Anglican clergyman.

Earlier authors of note who criticized the conflict thesis include E. A. Burt in *Metaphysical Foundations of Modern Physical Science* (1924), and Alfred North Whitehead in *Science and the Modern World* (1926). However, the Draper-White thesis found an echo in other authors. And then events, such as the Scopes trial, took place that lent themselves to being interpreted as additional episodes in the series of confrontations between science and religion. Ultimately, “despite the growing number of scholarly modifications and rejections of the conflict model from the 1950s on, the Draper-White thesis proved to be tenacious... At any rate, in the 1970s leading historians of the nineteenth century still felt required to attack it” (Wilson 2002, 21).

3. The Complexity Thesis

In recent times, as Wilson notes, the “complexity thesis” has gained ground. This thesis maintains that science and religion are closely intertwined, and that circumstances of a social and political kind must often be taken into account in order to correctly understand the relationship between the two.⁷ Two books of note in this line are *God and Nature*, a collective work edited by David Limberg and Ronald Numbers, and *Science and Religion* by John Hedley Brooke, first holder of the chair of Science and Religion at the University of Oxford. Brooke explains the complexity thesis, which he illustrates with many particular examples throughout his book, thus:

⁷ One definition of religion is “a set of beliefs, derived from divine revelation, concerning God and what we must do to please him,” but there are others as well. Some of the more recent books on the relationship between science and religion try to reframe the discussion in light of alternate definitions of religion. Matthew Stanley largely equates religion with theism in *Huxley’s Church and Maxwell’s Demon: From Theistic Science to Naturalistic Science*. Peter Harrison in *The Territories of Science and Religion* proposes to “describe how it is that we have come to understand the world in terms of these distinct categories ‘science’ and ‘religion’—how, in other words, we have come to separate the domain of material facts from the realm of moral and religious values” (Harrison 2015, xx). Harrison maintains that religion has been understood in different ways throughout the ages. Plainly, different understandings of what religion is are apt to result in different understandings of how it relates to science.

Serious scholarship in the history of science has revealed so extraordinarily rich and complex a relationship between science and religion in the past that general theses are difficult to sustain. The real lesson turns out to be the complexity. Members of the Christian churches have not all been obscurantists; many scientists of stature have professed a religious faith, even if their theology was sometimes suspect. Conflicts allegedly between science and religion may turn out to be between rival scientific interests, or conversely between rival theological factions. Issues of political power, social prestige, and intellectual authority have repeatedly been at stake. And the histories written by protagonists have reflected their own preoccupations. (Brooke 1991, 5)

4. The absence of proper philosophical analyses keep the conflict thesis alive

This is not to say that the conflict thesis has been completely defeated. It will probably always have defenders. In our day, one of the most prominent advocates of the irreconcilable differences between science and religion is the ethologist Richard Dawkins, first occupant of the Charles Simonyi chair for the Public Understanding of Science at the University of Oxford. On the occasion of a conciliatory statement on evolution made by Pope John Paul II in 1996, Dawkins criticized Gould's attempt to reconcile science and religion by relegating factual claims to science and ethical claims to religion. Dawkins' main argument is that religion, and more specifically Catholicism, "make existence claims, and this means scientific claims" (Dawkins 2003, 208).

The first example Dawkins gives to support his thesis is the Catholic doctrine that God directly intervenes to create a human soul for each human being, a teaching which amounts to claiming that there is a gulf between *Homo sapiens* and the rest of the animal kingdom. Dawkins takes the position that: "Such a gulf is fundamentally antievolutionary. The sudden injection of an immortal soul in the time line is an antievolutionary intrusion into the domain of science." As for major doctrines of the Roman Catholic Church, such as the Virgin birth, the bodily Assumption of the Blessed Virgin Mary, the Resurrection of Jesus, Dawkins asserts that: "These are all claims of

a clearly scientific nature... So is the theory that our souls survive bodily death and so are all the stories of angelic visitations, Marian manifestations, and miracles of all types” (Dawkins 2003, 208–209). Dawkins goes on to conclude that:

There is something dishonestly self-serving in the tactic of claiming that all religious beliefs are outside the domain of science. On the one hand miracle stories and the promise of life after death are used to impress simple people, win converts, and swell congregations. It is precisely their scientific power that gives these stories their popular appeal. But at the same time it is considered below the belt to subject the same stories to the ordinary rigors of scientific criticism: these are religious matters and therefore outside the domain of science. But you cannot have it both ways. (Dawkins 2003, 209)

As a matter of fact, the Catholic Church has taught all the doctrines mentioned by Dawkins many centuries before modern empirical science was born. Therefore, it is difficult to understand how they could derive their appeal from “their scientific power,” or why Dawkins says that “these are all claims of a clearly scientific nature.” The explanation may lie in an implicit assumption on Dawkins’ part that there cannot be any reality apart from the reality studied by science, nor any valid knowledge apart from scientific knowledge. But this assumption cannot be considered science. It is a well-known philosophical thesis that usually goes by the name of *scientism*.

5. Science and Scientism

There are many varieties of scientism, and whole books on the subject. In its most general form, scientism is the idea that scientific knowledge is the only valid kind of knowledge, or at least that any other knowledge claims should follow, or try to imitate, the methods of science. The problem is that scientism itself does not meet this requirement. It is neither science nor even a consequence of science. Therefore, scientism is self-defeating. This *philosophical* position generally stems from giving exaggerated importance

to the methods and achievements of science, while depreciating the value of other realms of knowledge.⁸

Specific forms of scientism usually highlight one particular science as the key to all the rest. For instance, *physicalism* presents physics as the source of all the sciences, and of all knowledge in general. In the 1930's, some members of the Vienna Circle promoted this view.⁹ Not only did they maintain that all scientific propositions should be derived from physics, and in the final analysis from sensory experiences, they maintained that all knowledge should be "reduced" to physics. Not surprisingly the different attempts to work out this idea failed. During the 1990s a new kind of *non-reductive physicalism* became popular among some philosophers who found in this formulation a way of disavowing reductionism, while at the same time admitting some kind of materialism. But views such as these cannot be considered scientific. Empirical science deals with matter, but we cannot conclude from this that only matter exists.

Dawkins would be right if he only meant that many mysteries and miracles in Christianity imply empirical claims. Miracles are facts that presumably do not follow natural law. However, if one admits that God exists, and that He is the First Cause of all that exists, then there is no difficulty in admitting that He is the author of the natural laws, and that, if He wishes to do so, He can act to suspend those laws.

Without doubt, empirical science presupposes that there exists a natural order governed by natural law. This assumption, contrary to what Dawkins would have one believe, is closely connected with the Christian notions of an infinitely wise and powerful God as the First Cause of an ordered world, and of the human being created in God's likeness, with the ability to know the order of the natural world. These Christian views were embraced by the

⁸ Artigas points out the patent deficiencies of scientism in many of his works, for example: "The claim that there is no valuable knowledge outside science certainly cannot be supported from within science. This is an extremely simple philosophical error, akin to a child claiming that because all the people he knows are in his house, that there cannot be people outside his house. When we reflect on science—its aims, its values, its limits—we are doing philosophy, not science" (Artigas 2007, 40). See also, Artigas 2006, 196–199.

⁹ In (2006, 30–35) Artigas discusses the influence of the Vienna Circle at length.

vast majority of the pioneers of modern empirical science in the seventeenth century: Kepler, Galileo, Newton, and many others. From a Christian perspective, God's activity in the world is not limited to particular punctual interventions. God acts continually on everything, as everything depends on Him as the First Cause of all being. Usually He acts on the natural world following the laws that He himself has impressed on it. But there is no difficulty in admitting that sometimes He can act otherwise, and we call this a miracle.

The Christian position on the spiritual nature of the human soul also does not conflict with any methodological principle or conclusion of science. Science cannot tell us one way or the other whether each human individual is in fact a single being that possesses both material and spiritual dimensions. For if spiritual realities exist, they cannot be the subject of empirical science, which considers only those theories that can be submitted to empirical control by repeatable experiments. Here again we see the crucial need for philosophical reflection which does not proceed by way of experiment, but rather reasons from common experience to address certain questions science cannot address, such as what human intelligence consists in and whether some part of the human being continues in existence after death.

Scientism simplifies the world and our arguments, at the price of leaving aside dimensions of reality that must be taken into account if we are to provide a more complete explanation of it. Simplifying is a good method for studying particular issues. But a good simplification never forgets what it has left aside. If there are human dimensions that have a spiritual character, we should not try to explain them away. We should admit their reality, and try to understand them using methods commensurate with their nature.

Conclusion

"Evolution does not presuppose the absence of a creator or God," said Judge Overton in his sentence. For the same reasons, we may say more generally, "Empirical science does not presuppose the absence of a creator or God." The conflict thesis is untenable. At the very same moment that one

begins to argue that empirical science is not compatible with spirituality and therefore with religion, one must face the inescapable contradictions that scientism, in its different varieties, is bound to produce. If the authors of Act 590 had recognized the rightful place of philosophy in discussions concerning science and religion, not only would they have never embarked on their misguided attempt to pass off religion as science, they would also have realized that a better tack to circumvent the attempts by certain science teachers to foist atheism on students under the pretext of teaching them evolutionary science is to introduce into schools some basic philosophical instruction as to what constitutes science and what are the limits of science and of religion. Again, although this would not entirely dispel the tension between science and religion, as the theological issue of the correct manner of interpreting scripture would remain, it would have helped many students recognize the needlessness of opposing the two domains.

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