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THE CULTURAL DANGERS OF SCIENTISM AND COMMON SENSE SOLUTIONS

Who can deny the extraordinary achievements of science? The technology that we rely on everyday and the life-saving medical procedures that were unavailable to previous times are all the fruit of scientific research. Whether it is intellectually, in universities, where science receives great attention and funding, or more generally, in the culture, where the fruits of science are often revered and consumed en masse, science exerts tremendous influence over our lives. It is so easy to be proud of our scientific achievements that many have come to view science as the pinnacle of human knowledge. In fact, some scientists (and even some philosophers) hold that science is the only way to knowledge.[1] This view is usually called 'scientism' and, as I will argue, it is a serious obstacle to renewing the Western culture.

Although there is much that is good in modern science, misunderstanding its proper role in our intellectual and everyday lives is a serious danger, and the cause of much decline and confusion in the West. Unfortunately, some famous scientists have misused discoveries in science to promote the reductionism, materialism, and secularism we find today in the West. For example, scientists such as Richard Dawkins and Sam Harris have targeted general audiences with the message that we should look to modern science to treat questions about ethics and the existence of God.[2] In

[1] Jaegwon Kim notes that naturalism is at the heart of much of contemporary analytic philosophy and that the core of naturalism "seems to be something like this: [the] scientific method is the only method for acquiring knowledge or reliable information in all spheres including philosophy." Jaegwon Kim, "The American Origins of Philosophical Naturalism," *Journal of Philosophical Research* 28:supplement (2003): 87.

this way, for many, scientists have become the new high priests of our age—replacing the theologians, philosophers, and poets of prior ages. As I will explain later, such a situation is dire and calls for cultural renewal.

I will begin, first, by defining what is meant by 'science' and 'scientism.' Second, I will discuss some of the cultural dangers of scientism. Third, I will give several arguments why scientism should be rejected and why science needs metaphysics. Fourth, and finally, I conclude by noting how some of the questions and arguments I raised in the previous sections can be appropriated to help the general public understand the limits of science and the dangers of scientism.

Science vs. Scientism

Unfortunately, philosophers of science have struggled to reach consensus on an acceptable definition of science. In fact, some philosophers of science, such as Larry Laudan, have argued that all known attempts to distinguish science from non-science have failed.[3] Nevertheless, I think the key to understanding the difference between modern sciences, such as biology and physics, and other disciplines, such as philosophy and theology, lies in both its object of study and in its methodology. Modern science uses hypothetico-deductive reasoning and the experimental method pioneered by Galileo in order to study different kinds of changes that occur in the natural world. Although some experimentation occurred in ancient Greece and during the Middle Ages, it did not become a central feature of science until the Scientific Revolution of the seventeenth century.

Generally speaking, the scientific method is as follows. First, one forms a hypothesis about how things work in the world. Second, one deduces a prediction (or predictions) from the hypothesis. Third, tests are performed to determine whether or not these predictions are confirmed by experiment or observation. Scientists prefer hypotheses and theories that are well confirmed and tend to abandon those that are not. However, strictly speaking, as Karl Popper has argued, the hypothetico-deductive reasoning cannot be used to prove a hypothesis or theory true in a defini-

[2] See Richard Dawkins, *The God Delusion* (New York: Houghton Mifflin Company, 2006), and Sam Harris, *The Moral Landscape: How Science Can Determine Human Values*, (New York: Free Press, 2010).

[3] Larry Laudan, "The Demise of the Demarcation Problem," in *But Is It Science?: The Philosophical Question in the Creation/Evolution Controversy* (Amherst, NY: Prometheus Books, 1996), 337–350.

tive sense.[4] While the scientific method does not allow for proof, Popper argued that it does allow for falsification. For example, Newtonian physics was very well confirmed for three centuries, but it eventually was falsified by Einstein's relativity. Still, much in Newtonian physics was able to be incorporated in Einstein's physics, and so philosophers of science who describe themselves as realists hold that very well-confirmed theories approximate the truth, if falling short of total truth.

The above discussion enumerates some of the limitations of the scientific method and therefore of the modern sciences. Another important limitation argued by Popper was that if a hypothesis or theory is not empirically testable, then it is not a scientific hypothesis. This will be an important point in our discussion of scientism below. For if something is claimed in the name of science that is not testable by the methods of science, what is put forth is no longer science. As we shall see, metaphysical materialism disguised as science is one of the cultural dangers of scientism.

Turning to scientism, Mikael Stenmark has identified many different kinds of scientism, including epistemic scientism, ontological scientism, axiological scientism, and existential scientism.[5] To discuss all of these in the depth that they deserve would require more space than I have here. Therefore, I will focus mainly on the first two because they are, arguably, the most important and common kinds of scientism. However, I will briefly comment on the others as well.

Let us begin with *epistemic scientism*, which is the view that "the only reality that we can know anything about is the one science has access to."[6] This kind of scientism tries to reduce all knowledge to scientific knowledge. Under this view, other disciplines, such as philosophy and theology, must either be absorbed into science, and thereby undergo significant changes, or be denied the status of knowledge. The biologist Edward O. Wilson, for example, espouses this view in his book *Consilience: The Unity of Knowledge*.[7]

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[4] Popper argues that "[A] statement can never be finally established by establishing some of its consequences." Karl Popper, *The Logic of Scientific Discovery* (New York: Harper, 1959), 259. See also, Karl Popper, *Conjectures and Refutations* (New York: Harper, 1963).

[5] Mikael Stenmark, *Scientism: Science, Ethics and Religion* (Aldershort: Ashgate, 2001), 1–17.

[6] Id., 4.

[7] Edward O. Wilson, *Consilience: The Unity of Knowledge* (New York: Vintage, 1999). In chapter two of his book, Wilson explicitly pleads guilty to the charge of scientism and says one of his goals is to turn "as much philosophy as possible into science." Id., 11–12.

Although epistemic scientism puts limits on human knowledge, it at least leaves open the possibility that some realities exist that science cannot discover, such as God. In contrast, *ontological scientism* puts limits on what exists objectively because it holds that "the only reality that exists is the one science has access to."[8] As Stenmark notes, Carl Sagan's famous remark that "the Cosmos is all that is or ever was or ever will be" is an example of ontological scientism. The reason is that in order to make such a claim, a scientist like Sagan must hold that science gives us complete knowledge of reality. If science does not give us complete knowledge of reality, or if we are unsure that it does, then we are not warranted in drawing a conclusion like that of Sagan's above. I will return to this point later.

The next kind of scientism that Stenmark discusses he calls *axiological scientism*, and he defines it as the view that "science alone can explain morality and replace traditional ethics."[9] Finally, there is *existential scientism*. According to Mary Midgley, this is "the idea of *salvation through science alone*," though Stenmark defines it as the view that "science alone can explain and replace religion."[10]

Cultural Dangers of Scientism

It should not be difficult to see the cultural dangers of scientism. First, let us consider the dangers of ontological scientism. History shows that some scientists, who have ascribed to ontological scientism, whether consciously or not, have claimed that scientific discoveries imply metaphysical materialism. That is, the view that only matter and energy exist. This, of course, leads to several serious problems. First, it leads to the loss of God and with that the loss of hope for an afterlife, ultimate justice, and ultimate meaning. Second, materialism leads to an understanding of human nature bereft of freedom and dignity. Consider the comments made by William B. Provine, a biologist and historian of science, about a quarter of a century ago:

> Modern science directly implies that the world is organized strictly in accordance with deterministic principles or chance. There are no purposeful principles whatsoever in nature. There are no gods and

[8] Stenmark, *Scientism: Science, Ethics and Religion*, 8.
[9] Id., 12.
[10] Mary Midgley, *Science as Salvation* (London: Routledge, 1992), 37; Stenmark, *Scientism: Science, Ethics and Religion*, 14.

> no designing forces that are rationally detectable . . . Second, modern science directly implies that there are no inherent moral or ethical laws . . . Third, human beings are marvelously complex machines . . . we must conclude that when we die, we die and that is the end of us . . . There is no hope of life everlasting . . . The universe cares nothing for us . . . There is no ultimate meaning for humans.[11]

In a similar vein, consider the comments made two years ago by Jerry Coyne, a professor of biology, in the *Chronicle of Higher Education*:

> [F]ree will is ruled out, simply and decisively, by the laws of physics . . . Your decisions result from molecular-based electrical impulses and chemical substances transmitted from one brain cell to another. These molecules must obey the laws of physics, so the outputs of our brain—our "choices"—are dictated by those laws . . . So what are the consequences of realizing that physical determinism negates our ability to choose freely? . . . What is seriously affected is our idea of moral responsibility, which should be discarded along with the idea of free will.[12]

Finally, consider the comments of Steven Pinker, a professor of psychology, who, last year, espoused axiological scientism, while flirting with existential scientism:

> [T]he worldview that guides the moral and spiritual values of an educated person today is the worldview given to us by science . . . The facts of science, by exposing the absence of purpose in the laws governing the universe, force us to take responsibility for the welfare of ourselves, our species, and our planet. For the same reason, they undercut any moral or political system based on mystical forces, quests, destinies, dialectics, struggles, or messianic ages. And in combination with a few unexceptionable convictions—that all of us value our own welfare and that we are social beings who impinge on each other and can negotiate codes of conduct—the scientific facts militate toward a defensible morality, namely adhering

[11] William B. Provine, "Progress in Evolution and Meaning in Life" in *Evolutionary Progress*, ed. Matthew H. Nitecki (Chicago: University of Chicago Press, 1988), 64–66; 70.
[12] Jerry A. Coyne, "You Don't Have Free Will," *The Chronicle of Higher Education*, March 18, 2012 [http://chronicle.com/article/Jerry–A–Coyne/131165/, accessed on 18.08.2014].

> to principles that maximize the flourishing of humans and other sentient beings. This humanism, which is inextricable from a scientific understanding of the world, is becoming the de facto morality of modern democracies, international organizations, and liberalizing religions, and its unfulfilled promises define the moral imperatives we face today.[13]

Of course, it is possible to espouse epistemic scientism alone, and reject the other kinds of scientism mentioned above. However, the cultural dangers of espousing epistemic scientism alone are not much better. As I mentioned above, under epistemic scientism other disciplines, such as philosophy and theology, must either be absorbed into science, and thereby undergo significant changes, or be denied the status of knowledge. The effect of this is to disorder the hierarchy of disciplines of knowledge. For example, metaphysics is either eliminated or reduced to something else. As a case in point, consider the position of James Ladyman and Don Ross, both proud defenders of scientism. They argue that metaphysics should be the hand-maiden of the modern sciences, defining metaphysics as "the enterprise of critically elucidating consilience networks across the sciences."[14]

Unfortunately, the elimination or reduction of different disciplines to science prevents a proper understanding of reality and precludes the attainment of wisdom. As Mortimer J. Adler argued, if science, philosophy, and religion are not "properly distinguished, they cannot be properly related . . . [and if they are not properly related] cultural disorder, such as that of modern times, inevitably results."[15] Of course, defenders of scientism do not see it this way. They see scientism as "the true foundation for an enlightened understanding of the world," to borrow a phrase from Pope Benedict XVI.[16] But is scientism the true foundation for an enlightened

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[13] Steven Pinker, "Science is not Your Enemy" *New Republic*, August 6, 2013 [http://www.newrepublic.com/article/114127/science–not–enemy–humanities, accessed on 18.08.2014].

[14] James Ladyman and Don Ross, with David Spurrett and John Collier, *Everything Must Go: Metaphysics Naturalized* (Oxford: Oxford University Press, 2007), 28. Chapter one of this book is titled "In Defence of Scientism."

[15] Mortimer J. Adler, "God and the Professors," *Philosophy is Everybody's Business* 9:3 (2003): 8.

[16] This was delivered in 1999 at a lecture at the Sorbonne in Paris, and was later published in the book *Truth and Tolerance: Christian Belief And World Religions* (San Francisco: Ignatius Press, 2004), 178.

understanding of the world? I shall argue it is not, demonstrating that both epistemic scientism and ontological scientism are intellectually indefensible.

Scientism and Its Problems

Let us begin with ontological scientism, which is the view that "the only reality that exists is the one science has access to." Recall that earlier, I made the point that if science does not give us complete knowledge of reality, or if we are unsure that it does, then ontological scientism is unwarranted. So let me raise the following questions. Do we know for certain, that science does or can give us complete knowledge of reality? Or is this merely an assumption? If it is an assumption then, obviously, there is no guarantee that it is true. And if it is claimed that it is not an assumption, then it must be knowable by scientific means since ontological scientism entails epistemic scientism. Unfortunately, for proponents of ontological scientism, it does not seem possible to determine through scientific experiment that the scientific method can give us complete knowledge of reality. Stenmark discusses the problem in detail:

> [H]ow do you set up a scientific experiment to demonstrate that science or a particular scientific method gives an exhaustive account of reality? I cannot see how this could be done in a non-question begging way. What we want to know is whether science sets the limits for reality. The problem is that since we can only obtain knowledge about reality by means of scientific methods . . . we must use those methods whose scope is in question to determine the scope of these very same methods. If we used *non*-scientific methods we could never come to *know* the answer to our question . . . We are therefore forced to admit either that we cannot avoid arguing in a circle or that the acceptance of [ontological scientism] . . . is a matter of superstition or blind faith.[17]

This is a serious problem for ontological scientism. Ironically, ontological scientism itself has turned out not to be a scientific view. And views that assume ontological scientism, such as Sagan's view of reality, are also not scientific views. Instead, they are metaphysical views that may or may not be true. Since the scientific method cannot be used to determine

[17] Stenmark, *Scientism: Science, Ethics and Religion*, 22–23.

whether or not such views are true, another non-scientific discipline, namely metaphysics, would have to make the attempt. But this is only possible if one chooses to reject both ontological and epistemic scientism. Epistemic scientism must be rejected since it denies that status of knowledge to metaphysics.

However, there is another option. Scientists can reject both ontological scientism and metaphysics, while continuing to accept epistemic scientism. Of course, scientists who take this option must refrain, unlike Sagan, from taking any metaphysical positions. But this raises another question, namely, is the retreat into epistemic scientism defensible? Stenmark gives two reasons why the answer is "no."

First, he argues that epistemic scientism is self-refuting.[18] This is because, once again, we cannot use scientific experimentation to know that "the only reality that we can know anything about is the one science has access to." As such, epistemic scientism collapses under its own weight. Second, Stenmark notes that if we are able to know some things independently of science then epistemic scientism is falsified. He gives detailed arguments, which I cannot reproduce here, that there are indeed things we know apart from science. These include memory, observational knowledge, introspective knowledge, linguistic knowledge, and intentional knowledge.[19] Moreover, he argues that the activity of science itself presupposes these more basic kinds of knowledge.[20]

While Stenmark's arguments above are enough to undermine epistemic scientism, I want to make the additional argument that science needs metaphysics. The key to such argumentation can be found in the fact that science itself presupposes metaphysical knowledge and metaphysical views that are not reducible to science. Let us examine some of these presuppositions.

The Necessity of Metaphysics

One reason why scientists cannot escape metaphysics is because the activity of science itself presupposes some metaphysical notions and principles. As the philosopher of science Del Ratzsch explains:

[18] Id., 32.
[19] Id., 26–31.
[20] Id., 18–33.

> One simply cannot do significant science without presuppositions concerning, for example, what types of concepts are rationally legitimate, what evaluative criteria theories must answer to, and what resolution procedures are justifiable when those criteria conflict, as well as answers to deeper questions concerning aspects of the character of reality itself, concerning the nature and earmarks of truth and of knowledge, concerning what science is about and what it is for, concerning human sensory and cognitive and reasoning capabilities, and other matters . . . Science cannot be done without a substantial fund of nonempirical principles and presuppositions.[21]

Ratzsch argues that some of the metaphysical principles that scientists adopt are empirically at risk, and therefore they can be rejected given certain discoveries. For example, he discusses how the philosophical principle that natural explanations must be deterministic was ultimately rejected due to the discovery of quantum physics.[22] I agree with Ratzsch on this point. However, I would add that there are at least some metaphysical principles and notions that are necessary presuppositions of science and therefore they cannot be rejected unless one is willing to reject science itself.

In making this claim, I should note that I am presupposing a realist conception of science, namely, the view that the aim of science is to discover objective truths about reality, at least approximately, where reality is understood as that which exists independently of our minds.[23] As examples of such necessary presuppositions of science, I would offer the principle of non-contradiction and the notion of truth, which we shall examine next.

For Aristotle, the principle of non-contradiction is ultimately a metaphysical principle, which he formulates as follows: "[I]t is impossible for anything at the same time to be and not to be."[24] If scientists hold that the metaphysical principle of non-contradiction is false, then we are led to absurdity. This is because a denial of non-contradiction means that it is

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[21] Del Ratzsch, *Nature, Design, and Science: The Status of Design in Natural Science* (Albany, NY: State University of New York Press, 2001), 82.
[22] Id., 110.
[23] Realism in one form or another has been the dominant view of science for most of history and it is currently the dominant view among philosophers of science. See Frederick Suppe, *The Structure of Scientific Theories* (Urbana: University of Illinois Press, 2nd ed., 1977), 652, 716–728.
[24] Aristotle, *Metaphysics*, 1006a2–3, trans. W. D. Ross, in *The Basic Works of Aristotle*, ed. Richard McKeon (New York: Random House, 1941), 737.

possible for anything at the same time to be and not to be. So, for example, the planet earth can be both 10,000 years old and 4.5 billion years old at the same time for the same observer. Under these conditions, reality itself is so bizarre that I would argue it is no longer capable of being investigated scientifically.

To demonstrate this, consider another metaphysical notion that is presupposed by science, namely, truth. If truth is the conformity of a proposition with reality and reality itself exists in a contradictory way then there will be double truths. For example, if the planet earth can be both 10,000 years old and 4.5 billion years old at the same time then it will be true that the planet earth is 10,000 years old and it will *also* be true that the earth is 4.5 billion years old. Of course, we could deny that truth is the conformity of a proposition with reality but that, it seems, would lead us to some kind of relativism.

As the above makes clear, the activity of science, at least when it is understood in a realist way, presupposes a specific kind of philosophical foundation. And elements of this foundation such as the principle of non-contradiction and the notion of truth cannot be investigated or justified through the scientific method. As such, they will have to be treated in another discipline, namely philosophy, and, more specifically, metaphysics. This treatment is necessary to the extent that scientists want to hold that their theories are true, or at least approximately true, and in order to respond to the postmodernist attacks on science that have challenged its status as knowledge.

Modern science needs metaphysics, then, because a realist conception of science requires a philosophical foundation, part of which must be metaphysical. Because metaphysics is inescapable, scientists and metaphysicians should engage in interdisciplinary work. But in order for that to happen the current climate must change. Elsewhere, I have argued for a neutral metaphysical framework for scientists and members of other disciplines to conduct their investigations.[25] The goals of this framework are to clarify the connections between different disciplines, preserve the autonomy of each discipline, prevent disciplines from overstepping their bounds, and facilitate interdisciplinary work among disciplines. An important part of my framework is called the principle of methodological neu-

[25] Robert A. Delfino, "Scientific Naturalism and the Need for a Neutral Metaphysical Framework," in *Science and Faith within Reason: Reality, Creation, Life and Design*, ed. Jaume Navarro (Surrey, England: Ashgate, 2011), 43–59.

tralism. One aspect of the principle of methodological neutralism is the following. If the methods of science, for example, cannot handle a particular issue then scientists must remain neutral on that issue and hand it over to a discipline (or disciplines) that can handle it. Similarly, other disciplines must also turn over questions that they cannot handle.

This methodological principle, along with the method, subject, perspective, and aim of the various disciplines, helps to clarify the boundary lines between disciplines. And clarifying the boundary lines should help to reduce some of the tension between science and other disciplines since much of this tension arises when disciplines overstep their bounds. Accordingly, my framework helps to prevent scientism and it also helps to distinguish and relate the various disciplines of knowledge, all of which is necessary to bring about cultural renewal.

Common Sense Solutions

Let me end, then, by summarizing some common sense questions and arguments that can be addressed to the general public in order to combat scientism. After explaining the general outlines of the scientific method to the general public, the following seven points should be raised.

1. Is it not absurd to say that only modern science gives us knowledge? Modern science only came into existence in the seventeenth century or, perhaps, a little earlier. Did human beings really have no knowledge prior to that?

2. Is it not true that human beings had and still have various kinds of knowledge independently from modern science? Consider, as examples, your own observational knowledge, introspective knowledge, linguistic knowledge, and intentional knowledge.

3. Is it not true that for modern science to be possible requires that we possess different kinds of non-scientific knowledge, some of which are listed above?

4. Is it not also impossible to do science without some metaphysical knowledge such as the principle of non-contradiction and the notion of truth?

5. Is it not absurd to hold that if science cannot detect something then it does not exist? Science would have to give us total knowledge of reality for that inference to be valid.

6. But you cannot set up a scientific experiment to prove that science gives total knowledge of reality or that only science gives us knowl-

edge. Because scientism, as a view, is not testable by the methods of science it is not a scientific view and therefore is self-refuting.

7. Therefore, we encourage you to think carefully about what is claimed in the name of science. Sometimes what is claimed goes beyond what the methods of science can determine.[26]

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SUMMARY

In his article the author begins by defining what is meant by 'science' and 'scientism.' Second, he discusses some of the cultural dangers of scientism. Third, he gives several arguments why scientism should be rejected and why science needs metaphysics. Fourth, and finally, he concludes by noting how some of the questions and arguments raised in the article can be appropriated to help the general public understand the limits of science and the dangers of scientism.

KEYWORDS: scientism, science, religion, philosophy, metaphysics, culture, common sense.

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