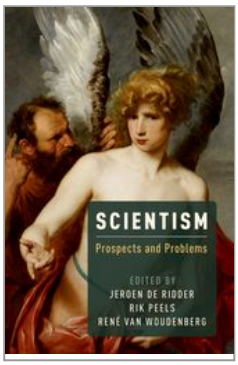

Scientism: Prospects and Problems
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A Conceptual Map of Scientism

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Abstract and Keywords

This chapter provides a conceptual map of scientism: an overview of the varieties of scientism and their relations. It argues that a plausible understanding of scientism is the thesis that the boundaries of natural science should be expanded in order to include academic disciplines or realms of life that are widely considered not to belong to the realm of science. Every participant in the debate on scientism should make clear which variety of scientism she or he adheres to or criticizes by specifying whether she is talking about (a) academic or universal scientism; (b) eliminative, methodological, epistemological, ontological, moral, or existential scientism; (c) full or partial scientism; and (d) in the case of moral and existential scientism: replacement or illusion scientism. The aim of this map is to provide clarity in a debate that is often confused and to help one see what one is committed to in adopting a particular scientistic position.

Keywords: scientism, epistemological scientism, ontological scientism, moral scientism, existential scientism, science, knowledge, entailment, conceptual map

1.1 Introduction

Few people living in Western societies today would deny that science has great value. It is also widely believed, though, that the scope and value of science can be exaggerated; science has its boundaries and those boundaries should not be crossed—below, I say more about how this is to be understood. Philosophers or scientists who *do* cross what are thought to be the boundaries are often referred to as subscribing to or practicing *scientism*. Here is a quote from the American

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historian of science William Provine that many would consider as an instance—or even several instances—of scientism:

> Modern science directly implies that the world is organized strictly in accordance with mechanistic principles. There are no purposive principles whatsoever in nature. There are no gods and no designing forces that are rationally detectable. . . . modern science directly implies that there are no inherent moral or ethical laws, no absolute guiding principles for human society. . . . human beings are marvelously complex machines. . . . when we die, we die and that is the end of us. . . . Free will as it is traditionally conceived—the freedom to make uncoerced and unpredictable choices among alternative possible courses of action—simply does not exist. . . . There is no ultimate meaning for humans. (Provine 1988: 27–29)

I said that many would describe this as a clear case of scientism. But precisely what *is* scientism? If we consider the passage just quoted, **(p.29)** we discover a wide variety of different claims: Science implies that the world is purely mechanistic; that free will, as traditionally conceived, is an illusion; that there is no ultimate meaning for us; and so on. This gives rise to all sorts of questions. Is each of these theses an instance of scientism? Are there other kinds of scientism that are not found in this quote? Is there an underlying basic idea in virtue of which these claims are widely considered to be instances of scientism? How do different kinds of scientism relate to each other?

The aim of this chapter is to provide a framework for answering questions like these by construing a *conceptual map of scientism*. By "scientism" I mean, roughly, the view that the boundaries of science should be expanded in order to encompass other academic disciplines and/or other realms of reality, such as human cognition in general or morality. What such expansion amounts to depends on the variety of scientism in question. It can mean, for instance, that only science can tell us what exists or that science should replace common sense in a domain like morality. In what follows, I confine myself to the natural sciences, such as biology, physics, and cosmology, because paradigm instances of scientism are cashed out in terms of these disciplines, even though one could make similar claims for disciplines such as sociology and economics.

To get sharper into focus what I mean by "scientism," let me formulate three constraints on something to count as an instance of scientism. These constraints are based on how words like "scientism" and "scientistic" are widely used.

First, I treat scientism as a particular *claim* or *thesis*. This is not the only way one could think of scientism. One might also think of scientism as some kind of attitude, affection, stance, or still something else.[1] For two reasons, I nonetheless prefer to treat scientism as a *thesis*. First, as evidenced by the quotations given in this chapter, scientism as a thesis is frequently found in the

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writings of scientists and philosophers. Second, it seems that every attitude, affection, or stance, at least if it is to be up to discussion, can be translated into a thesis, namely, the thesis that it is *good* to have that affection, attitude, or stance. No matter how one understands "scientism," then, it will always imply some scientistic thesis or other.

Second, every instance of scientism puts the natural sciences or even a specific natural science, such as physics, center stage. Each case of scientism, then, is a claim about the relation that should obtain between the natural sciences **(p.30)** on the one hand and something else—another academic discipline or another realm of reality—on the other. This means that the claim that *scientists themselves* are somehow superior to other people falls outside the scope of this chapter, even though this claim might in some way be related to scientism (see Snow 1972: 11, 48).

Third, even though the word "scientism" is often used pejoratively, it need not be. For instance, Don Ross, James Ladyman, and David Spurrett, in *Every Thing Must Go* say *expressis verbis* that they adhere to scientism and go on to defend it (Ross et al. 2007: 1–65; see also Rosenberg 2011: 6). Thus, to claim that something is an instance of scientism is *not* thereby to take a positive or negative stance toward the relevant assertion.[2] In fact, I think that most philosophers and scientists will embrace at least some of the weaker versions of scientism described in this chapter. Thus, a thesis is an instance of scientism only if it is formulated in such a way that it is up to discussion.

When I say that I provide a *conceptual map* of scientism, I mean that I analyze the varieties in which scientism comes and how these varieties relate to each other, in order consequently to display the results of these analyses in a diagram. In doing so, I contrast my view with that of others who have written on scientism, especially Mikael Stenmark, since his valuable work on scientism is both detailed and influential.[3] It is *not* my aim to draw a map of *all* possible instances of scientism. Rather, I aim to draw a map of the most important varieties of scientism that we find in the literature. In construing the map I use the words "variety," "version," and "instance" of scientism. By a "variety of scientism" I mean a *species* of the *genus* scientism: The variety entails scientism, but not *vice versa*. By a "version of scientism" I mean a particular way of understanding a variety of scientism. And by an "instance of scientism" I mean a particular person's written or spoken verbal expression of her scientism.

The project of providing a conceptual map of scientism is important for at least two reasons. First, the word "scientism" is often used in science, philosophy, and in the wider culture and frequently in a pejorative sense. However, it is often unclear what is meant when someone is labeled as an adherent of scientism. We can judge whether such labeling is correct only if we have some grip on the term "scientism" and the varieties in which it comes. Second, it **(p.31)** is important

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to see what an adherent of a particular variety of scientism is committed to. If a particular variety of scientism commits one to another variety with unpalatable implications, the position might be less plausible than initially thought. Or an adherent of scientism might falsely assume that a particular kind of scientism commits her to another kind of scientism. Whether this is indeed the case is something that the conceptual map will tell us.

This chapter is structured as follows. First, I sketch the main varieties of scientism. I distinguish between academic and universal scientism. Academic scientism comes in two varieties: methodological and eliminative scientism; whereas universal scientism comes in four varieties: epistemological, ontological, moral, and existential scientism. Subsequently, I show how these varieties relate to each other. A defense of each of the entailments can be found in the Appendix to this chapter. Next, I argue that there is a nontrivial set of necessary and sufficient conditions that a claim should meet in order to count as an instance of scientism. Finally, I draw the threads of this chapter together by giving four conclusions.

1.2 Varieties of Scientism

1.2.1 Academic Scientism 1 and 2: Methodological and Eliminative Scientism

The main distinction that we need to make is that between what I call *academic* scientism and *universal* scientism. Academic scientism is restricted to the academic disciplines,[4] whereas universal scientism is meant to apply both inside and outside of the academy. We will see in a moment what these claims amount to.

The first distinction we need to make with respect to *academic* scientism is between *methodological* and *eliminative* scientism. Whereas the methodological variety grants that, say, philosophy and psychology are proper academic disciplines that ask sensible questions, it asserts that they are so only if they adopt the methods of the natural sciences, such as observation and experimentation. Thus, the traditional questions of, say, theology or philosophy, can be answered only by using the methods of the natural sciences.[5] The eliminative version is stronger in that it claims that academic disciplines **(p.32)** other than the natural sciences, such as the humanities, have nothing to add to the natural sciences if properly carried out. The questions asked in, say, psychology and philosophy, are nonsensical or obscure. We should abandon the subject matters of these disciplines altogether. For example, Otto Neurath gives a rather rhetorical statement of his view that metaphysics should be given up in favor of physics when he says:

> how does the elimination of metaphysics proceed in practice? Men are induced to give up senseless sentences and freed from metaphysics. But must this always remain so? Must everyone in turn go through metaphysics as through a childhood disease—perhaps the earlier he gets

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> it, the less dangerous it is—to be led back to unified science? No. *Every child can in principle learn to apply the language of physicalism correctly from the outset*, first in a crude form, then in a more refined and precise way. (Neurath 1987: 9)

Neurath is rather explicit about his eliminative academic scientism. Others, such as Patricia Churchland and Stephen Stich, are less explicit. They argue that, since no consensus is forthcoming after two thousand years of discussion, we should abandon traditional philosophical problems, such as how knowledge is to be analyzed.[6] These problems should be left aside altogether, since they cannot be solved by means of natural science. The assumption here is, clearly, that only natural science delivers what we are looking for (consensus) and that we should, therefore, give up any academic disciplines that do not employ the methods of natural science.[7]

A second distinction that is relevant here is that between *partial* and *full* academic scientism. Whereas *partial* academic scientism makes a scientistic claim about only *some* of the academic disciplines that are distinct from the **(p. 33)** natural sciences, *full* academic scientism is a claim about *all* other academic disciplines than the natural sciences. Thus, Churchland's and Stich's claim that traditional epistemology should be replaced with neuroscience and cognitive psychology is an instance of *partial* scientism, whereas E. O. Wilson adopts a version of *full* scientism when he says: "It may not be too much to say that sociology and the other social sciences, as well as the humanities, are the last branches of biology waiting to be included in the Modern Synthesis [that is, Neo-Darwinism; RP]" (Wilson 1975: 4). His idea seems to be that *all* academic disciplines should be reduced to the natural sciences, especially to biology.

An exhaustive map of scientism would encompass different degrees of scientism. For instance, Francis Crick's claim that everything can be explained by physics and chemistry (Crick 1966: 14, 98) seems weaker than Rosenberg's claim that physics is the whole truth (Rosenberg 2011: 25), but stronger than those versions of eliminative scientism that claim that all academic disciplines are reducible to *some* natural science. I leave it to the reader to make these further distinctions, since they will fit into the conceptual map that I provide below.

1.2.2 Universal Scientism 1: Epistemological Scientism

I use the expression "universal scientism" as a term of art in that it refers to a variety of scientism that is supposed to apply *both within and outside of the academy*. Some philosophers call this variety of scientism "academic-external scientism." That seems misguiding, though. For, as we shall see, universal scientism applies not only to matters external to the university, but also *within* the academic realm. However, since universal scientism is as such not a claim about academic methodology or the reduction of one academic discipline to

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another, academic scientism is *not* a variety of universal scientism. In what follows, I distinguish four varieties of universal scientism.[8]

The first kind of universal scientism that we ought to distinguish is *epistemological* scientism. Epistemological scientism is scientism about the **(p. 34)** cognitive realm, both within and outside of the academy. There are numerous versions of epistemological scientism. Here are some of them:

> (a) All genuine knowledge is to be found only through (methods of) natural science.[9]
> (b) Natural science provides the only reliable path to knowledge.[10]
> (c) All questions can in principle be answered by natural science.[11]
> (d) Everything that can be known can be known through natural science.[12]

There is a lot to be said about each of these theses. Here, I will only note that they are *distinct* theses. For instance, to claim that all genuine knowledge is to be found through the natural sciences is different from claiming that the natural sciences are the only reliable path to knowledge, for one might think that other methods than the natural sciences incidentally (unreliably) lead to knowledge.[13] For practical reasons, in what follows, when I mention "epistemological scientism" I confine myself to (a), the claim that all genuine knowledge is to be found only through the (methods of) natural sciences.

As with academic scientism, we can distinguish between *full* and *partial* epistemological universal scientism. Since this might sound somewhat paradoxical—does "universal" not exclude "partial"?—let me explain this. I have used the word "universal" in the rather restricted sense of "applying to both the academic and non-academic realms." Now, one might think, for instance, that all knowledge about anything whatsoever is to be acquired by the natural sciences. That would count as *full* epistemological universal scientism. But one might also make the more restricted claim that all knowledge about, say, consciousness is to be acquired by the natural sciences. That would **(p.35)** be a version of *partial* epistemological universal scientism. An example of the latter is what Bertrand Russell says about God and immortality:

> God and immortality, the central dogmas of the Christian religion, find no support in science. . . . No doubt people will continue to entertain these beliefs, because they are pleasant, just as it is pleasant to think ourselves virtuous and our enemies wicked. But for my part I cannot see any ground for either. . . . no one of these hypotheses is more probable than any other; *they lie outside the region of even probable knowledge, and therefore there is no reason to consider any of them.* (Russell 1967: 44, my italics)

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Russell's point here seems to be that since natural science cannot deliver any knowledge about God and immortality, surely anything other than natural science will not deliver such knowledge either. This is a variety of *partial* epistemological universal scientism, because it is restricted to the supernatural realm, namely, God and immortality. It does not say that the only knowledge we could possibly have about *anything whatsoever* is to be produced by the natural sciences. It is nonetheless *universal* because it applies both within and outside of the academy: If Russell is right, then theology and philosophy will not be able to deliver any knowledge about God or immortality either.

1.2.3 Universal Scientism 2: Ontological Scientism

The second variety of universal scientism is not a claim about our knowledge, but about what does and does not *exist*. Now, some philosophers, such as Roger Trigg, have taken this variety of scientism to amount to the claim that only those things exist that are at some point discovered by science (Trigg 1993: 70). As I said in the Introduction, though, the aim of my conceptual map is to provide an overview of options that could plausibly be defended, *not* an overview of *any possible* position. And the claim that only those things exist that are discovered at some point by science is clearly implausible, given that there are vast stretches of the universe that we might never be able to explore.

Adherents of scientism sometimes conflate epistemological and ontological scientism.[14] Can we nonetheless distinguish ontological scientism as **(p.36)** a separate variety of scientism? I think we can. Take the opening statement of Carl Sagan's classic book *Cosmos*: "The cosmos is all that is or ever was or ever will be" (Sagan 2002: 4). Although he does not say this explicitly, the idea seems to be that every aspect of the cosmos can in principle be investigated by science. Other things, such as free will, universals, and immaterial souls do not exist, for all that exists is matter and can be investigated by science. *Full* varieties of ontological scientism will be rare, but *partial* ones will not. On partial ontological scientism, a specific kind of thing is nothing but (a collection of) those things acknowledged by the natural sciences. Undoubtedly, the most popular variety of partial ontological scientism is scientism *about human beings*. Carl Sagan, for instance, describes himself as a collection of water, calcium, and organic molecules (ibid.: 127).

Francis Crick has called the idea, which he himself advocates, that we are nothing but a pack of neurons "The Astonishing Hypothesis." It is astonishing, because it means that our memories, ambitions, beliefs, desires, choices, and sorrows are nothing but the collection or behavior of a large sum of nerve cells and their associate molecules (Crick 1994: 3, 258–259). Another version of partial ontological scientism is the idea that free will is an illusion because science can explain every decision without appeal to free will, as advocated, for instance, by William Provine in that quote that I gave in the Introduction.

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1.2.4 Universal Scientism 3: Moral Scientism

A third variety of universal scientism is *moral* scientism. There are two varieties of moral scientism. On the first variety, the natural sciences lead or will lead us to the good life. Here are some versions of it:

(a) The natural sciences guide us toward the morally good life.
(b) Common-sense morality should be replaced with scientific morality (Harris 2010).
(c) Our moral personal and social problems can be solved by the natural sciences.[15]

The second variety says something rather different. Here the basic idea is that science shows us or makes it sufficiently probable that morality is an *illusion*. Here are some versions of it:

(p.37)

(a) Science shows us that morality is an illusion.
(b) Science shows us that good and evil are merely social conventions.
(c) Science shows us that moral intuitions and beliefs are nothing but evolutionarily adaptive features of humans.

The second variety of moral scientism is clearly a case of *partial ontological scientism*. I will nonetheless also treat it as a variety of moral scientism, since it is explicitly about morality. I will call these two varieties respectively the *R-variety* (from "Replacement") and *I-variety* (from "Illusion").

According to some philosophers, such as Stenmark, there is a further variety of moral scientism, namely, the claim that evolutionary theory can fully explain our moral sense. I agree that adherents of moral scientism usually also make this claim. But it seems to me misguided to take this claim itself to be an instance or part of moral scientism. Our moral beliefs are a natural phenomenon and it is, thus, not at all controversial that there might be some kind of scientific explanation for many or maybe even all of our moral beliefs (not for *the truth* of those beliefs, but for *our holding* those beliefs), in terms of evolutionary theory or cultural history. In order for a view to count as moral *scientism*, it should make a stronger claim. According to E O. Wilson, for instance, scientists and humanists should seriously consider removing ethics from the hands of philosophers, in order to biologize it (Wilson 1975: 562). The idea seems to be that biological principles can be applied in the social realm and that they can be used to *justify* and not merely *explain* certain moral norms and values.[16]

Now, one might think that moral scientism is partial by its very nature, given that it is restricted to the moral realm. But this is mistaken. In the same way as there can be full and partial *academic* scientism, even though academic scientism is restricted to the academic realm, there can be full and partial moral

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scientism, even though moral scientism is restricted to the moral realm. One might think, for instance, that science can replace *some* of our morality, but not all of it, since we need to start from *some* moral intuitions. It *does* seem true, though, that on its *I-variety*, moral scientism does not come in full and partial varieties. It seems hard to defend that, say, moral obligations are illusions, but that moral intuitions can nonetheless be true. Hence, R-moral **(p.38)** scientism can be full or partial, whereas I-moral scientism can only be full scientism.

1.2.5 Universal Scientism 4: Existential Scientism

The final variety of universal scientism that I would like to distinguish is *existential* scientism. As with moral scientism, this kind of scientism comes in two rather different varieties. The first variety, which I call the *R-variety*, says that science should *replace* religion; mythology; secular ideologies, such as fascism and Marxism; and other nonscientific ways of answering our existential questions. Here are some versions of existential scientism:

> (a) Science should replace traditional religions and secular ideologies.[17]
> (b) Salvation can be achieved by (the methods of) science alone (cf. Midgley 1992: 37).

Richard Dawkins articulates existential scientism when he says that the answers we give to the big questions of life are meaningless unless they are informed by natural science, especially evolutionary biology. The entire intellectual traditions of, say, ancient Greek philosophy and Medieval scholastics are without worth, because they are not based on scientific research (Dawkins 1989: 1).

The second variety, which I will call the *I-variety* says that the idea that there is ultimate meaning or purpose in life is *illusory*. Provine's claim, quoted at the outset of this chapter, that modern science implies that there is no ultimate meaning for humans, that there are no gods, and that there are no absolute guiding principles for human society, is an example of this.

Some versions of the R-variety of existential scientism are full, others partial. One might think that science can answer *all* our existential questions or that science can replace *all* aspects of traditional religions. But one might also think that science can only replace *certain* aspects of traditional religions and secular ideologies, such as their answers to questions about the ultimate origin of human beings, but not answers to questions about meaning and purpose in life. Even its *I-variety* seems to admit of *full* and *partial* varieties. One might think that science shows that God is an illusion, but that there is **(p.39)** nonetheless objective meaning and purpose. One might think that properties concerning value and meaning supervene on natural properties, even though there is no God.

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Some have included other theses under the umbrella of “existential scientism.” According to Stenmark, for instance, the idea that evolutionary theory can explain religious beliefs and the view that it can undermine religious belief also count as part of existential scientism. It is true that adherents of existential scientism are likely to adopt these theses as well, but we should not conclude from that that these theses are instances of existential scientism. Several religious scientists and philosophers embrace the thought that our religious beliefs are produced by something like a *Hyperactive Agency Detection Device*,[18] and many of them would agree that certain ideas that were inspired by religion, such as that the earth is at the center of the universe, have been undermined by science. Still, they do not seem thereby to count as adherents of scientism.

1.2.6 Further Varieties of Universal Scientism?

Are these four versions of universal scientism exhaustive? Let me discuss two proposals for further varieties of universal scientism.

First, Stenmark distinguishes the thesis that a belief is rational only if it is the deliverance of natural science as a separate variety of scientism and calls it *rational* scientism. He interprets “epistemological scientism” as the claim that only the natural sciences can deliver *knowledge* and rightly points out that *that* thesis is conceptually distinct from rational scientism. He fails to acknowledge, though, that the two are closely related to each other. Imagine that you believe that only the natural sciences can deliver knowledge. Imagine also that you consider some proposition *p* that you believe you have no scientific evidence for. Then, if you are rational, you will believe that you cannot *know* that *p*. You will realize that if you nonetheless believe that *p*, you might turn out to be lucky and hold a true belief, but you will also realize that in such a case you will not *know* that *p*. But if you are aware of the fact that you cannot know that *p*, then how could you possibly rationally believe that *p*? On most accounts of rationality, the belief that one cannot know that *p* provides a defeater for rationally believing that *p*. Someone who is sufficiently rational will realize that if (she believes that) she cannot know that *p*, then she **(p.40)** cannot rationally believe that *p*. This means that *epistemological* scientism, in conjunction with some highly plausible principles about knowledge and rationality, entails *rational* scientism. And that means that we have good reason *not* to treat rational scientism as a separate variety of universal scientism, but as a version of epistemological scientism.

Second, Stenmark also distinguishes what he calls *axiological* scientism. The idea here is that natural science is more valuable than other ways of learning. Those other ways usually include at least the humanities, but some adherents of scientism add politics, sports, art, literature, and philosophy to the list.[19] Some philosophers seem to understand scientism almost exclusively along the lines of

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axiological scientism. According to Tom Sorell, for instance, scientism is the view that natural science is much the most valuable part of human learning.[20]

Is axiological scientism truly a separate variety of scientism? I doubt it is. For, one might ask *in what sense* the natural sciences are supposed to be more valuable than other ways of learning. In other words, *what kind of value* is referred to in axiological scientism? Three possibilities come to mind: Such value could be epistemic, moral, or existential. In other words, the natural sciences can be more valuable in that they are more likely to lead to knowledge, in that they guide us in leading the good life, or in that they help us to meet our existential needs. But axiological scientism will then be reducible to respectively epistemological, moral, and existential scientism. The only other kind of value that I can think of is *aesthetic* value: the value that beautiful music, painting, and architecture have. But it seems that (virtually) no one has made the rather bold assertion that science is *aesthetically* more valuable than other ways of learning. That means that we should not treat axiological scientism as an additional variety of scientism.

1.2.7 First Conceptual Map: The Varieties of Scientism

I will now provide the first conceptual map of scientism. It displays scientism's varieties. It should be read from left to right. In order to end up with a thesis **(p. 41)** that is sufficiently precise to be assessed, one should make *three* or, in the case of moral and existential scientism, even *four* choices:

(a) Is it *academic* or *universal* scientism?
(b) In the case of academic scientism: Is it *methodological* or *eliminative* scientism? In the case of universal scientism: Is it *epistemological, ontological, moral*, or *existential* scientism?
(c) Is it *full* or *partial* scientism?
(d) In the case of moral and existential scientism: Is it *Replacement* (*R*)-scientism or *Illusion* (*I*)-scientism?

Given that, as I argued, moral I-scientism will always be full rather than partial, there are *15* varieties of scientism. The difference between *ellipses* and *squares* indicates that one should choose between certain descriptive *adjectives* (say, academic or universal, partial or full) to end up with a specific *thesis* (say, eliminative partial weak scientism). The arrow between methodological and eliminative scientism with a cross over it indicates mutual exclusivity. The other arrows denote implication.

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As I said, this figure displays which choices an adherent of scientism as well as those who critique scientism will have to make in specifying what they are talking about. I suspect that many philosophers and scientists will adhere to at least *some* variety of scientism and quite a few to several of them. The figure makes clear that there are six main varieties of scientism: methodological, eliminative, epistemological, ontological, moral, and existential. Given that there is only one instance of mutual exclusion, namely, that between methodological and eliminative scientism, the adherent of scientism could in principle combine five varieties of scientism: epistemological, ontological, moral, existential, and either eliminative or methodological scientism.

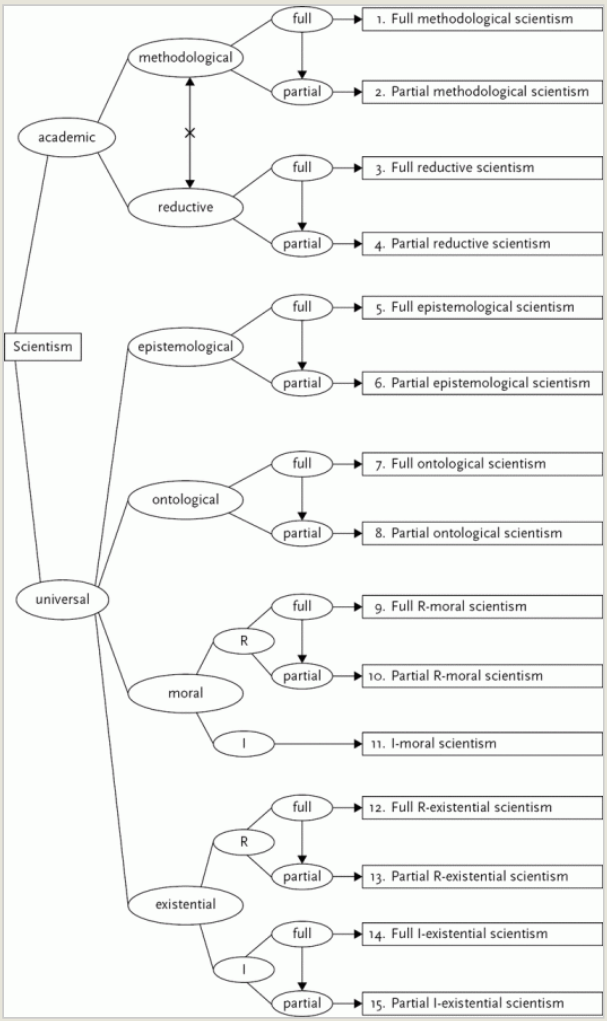

Figure 1.1 Varieties of scientism

1.3 The Interrelations of Scientism's Varieties

How do these varieties of scientism relate to each other, apart from the relation of entailment that holds *by definition* between full and partial scientism? Rather than bothering the reader with a defense of each of the relations that I take to obtain, I merely present the results of my analysis and refer those who want to know more to the Appendix, in which I spell out my reasons for thinking that each of these relations obtains. The implicatory relations among the 15 varieties of scientism described in Section 1.2 and referred to on the right-hand side of Figure 1.1 are also depicted in Figure 1.2. The second **(p.42)** **(p.43)** figure hierarchically displays the relations of implication that hold between different versions of scientism.

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For reasons of simplicity, I have not drawn arrows where a full version of scientism implies a partial version of scientism (that saves us seven arrows). The dotted lines indicate a disjunctive implication. For example, full epistemological scientism entails either full eliminative or full methodological scientism. Let me also point out that partial R-moral scientism and partial R-existential scientism could also have been placed one level higher.

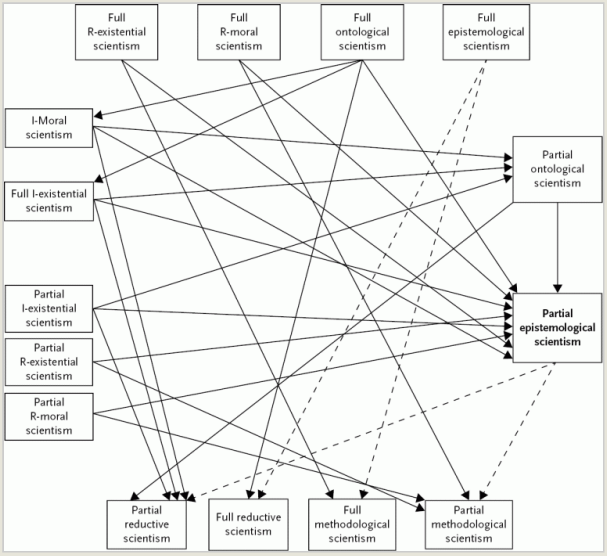

Figure 1.2 Logical relations between the varieties of scientism

A careful look at Figure 1.2 reveals some important facts about the relations between the varieties of scientism, as I defined them. There are *four* kinds of scientism that are at the top of the hierarchy in the sense that they imply other varieties of scientism without being implied by some other kind of scientism. At five different levels, there are nine kinds of scientism that are in the middle in that they are implied by certain kinds of scientism but also imply other kinds of scientism. And there are *two* varieties of scientism that are at the bottom in that they are implied by other kinds of scientism without **(p.44)** implying some other kind of scientism. Also, eliminative scientism and methodological scientism are clearly comparatively *weak* theses in that all of their varieties are found at the bottom of the hierarchy. Epistemological and ontological scientism, as well as the Replacement-varieties of moral and existential scientism are, depending on its specific version, to be found at the top or in the middle and are, therefore comparatively strong or average.

Also, the R-versions of moral and existential scientism are not entailed by any other kind of scientism. They *do* entail certain varieties of epistemological, ontological, eliminative, and methodological scientism, but adopting one of the latter varieties of scientism does not commit one to being an adherent of scientism about morality or existential issues. Next, full ontological scientism and full epistemological scientism are not entailed by any other variety of scientism, but they do entail other kinds of scientism, especially certain varieties of academic scientism. Generally, then, these are fairly strong versions of scientism. The variety of scientism that is implied by the largest number of other varieties of scientism is partial eliminative scientism, the thesis that at least some academic disciplines can be reduced to the natural sciences. It is implied by five other varieties of scientism. Finally, given that eliminative scientism

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seems stronger than methodological scientism in that it leaves no place at all for academic disciplines other than the natural sciences, the strongest position one could adopt is a combination of full epistemological, full ontological, full moral, full existential, and full eliminative scientism. Such a strong version seems adopted by William Provine and Alex Rosenberg (see the quotes earlier in this chapter).

Finally and most importantly, Figure 1.2 gives us good reason, in evaluating scientism, to focus on the variety of *partial epistemological scientism*. After all, it is entailed by most other varieties of scientism. On partial epistemological scientism, in a smaller or larger realm of life that goes significantly beyond what are widely considered to be the borders of the natural sciences, only the natural sciences provide rational belief and knowledge. This is implied by full epistemological scientism, full and partial ontological scientism, I-moral scientism, full and partial R-moral scientism, full and partial R-existential scientism, and by full and partial I existential scientism.

1.4 A Unifying Definition of Scientism

An important question that arises from this overview is whether all these varieties of scientism have something in common such that in virtue of meeting that condition they count as varieties of scientism. Slightly more **(p.45)** precisely, is there a *nontrivial* condition—not a disjunctive condition like being one of these varieties of scientism—that they all satisfy such that they are varieties of scientism because of that? This is an important question, for an answer to it might give us insight into how a conceptual map of scientism is to be drawn. For example, if scientism should be understood as a family resemblance concept, on which something counts as an instance of scientism if it is sufficiently similar to other instances of scientism, the resulting conceptual map will be rather different from the one we get when there is a set of necessary and sufficient conditions for being an instance of scientism.

1.4.1 Peacocke’s Definition

Many definitions of scientism suffer from the fact that they exclude one or several of the varieties of scientism that we distinguished above, theses that are widely thought to be instances of scientism. Take the following definition, provided by Arthur Peacocke:

> Scientism$_1$: The view that the *only* kind of reliable knowledge is that provided by science, coupled with a conviction that all our personal and social problems are “soluble” by enough science. (Peacocke 1993: 8)

With some flexibility, one could interpret the phrase that “our personal and social problems are “soluble” by enough science” as a statement of moral and existential scientism. Even then, though, methodological and eliminative academic scientism are only implicitly present in the definition and ontological scientism is completely absent from the picture. We need a broader definition, in

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order to do justice to the wide variety of scientistic theses that can be found in the writings of philosophers and scientists.

1.4.2 Radnitzky's Definition

More encompassing is Gerard Radnitzsky's definition:

> Scientism$_2$: The view that *science* has no boundaries, i.e. that eventually it will answer all theoretical questions and provide solutions for all our practical problems. (Radnitzky 1978: 1008; cf. also Churchland 2011: 3)

This definition is broad enough to encompass at least eliminative scientism and each of the four varieties of universal scientism. For instance, ontological **(p.46)** and epistemological scientism are each plausibly interpreted as varieties of the view that science can answer all our theoretical questions. Radnitzky's definition faces another problem, though. For it seems that we have now ruled out some versions of partial scientism. One might think, for instance, that only science provides us knowledge about the natural world, including human beings, but that we need our moral faculties rather than science to acquire knowledge about nonnatural properties, such as goodness and badness. Radnitzky's definition would have the implausible implication that such a view would not count as an instance of scientism because it does not say that *all* our questions can be answered by science. Peacocke's definition turned out to be too weak, whereas Radnitzky's analysis of scientism turns out to be too strong.

1.4.3 Stenmark's Definition

Stenmark's definition is broader than Peacocke's but weaker than Radnitzky's:

> Scientism$_3$: The view that the boundaries of science should be expanded to include disciplines (or answers to questions) that have not previously been considered a part of the domain of science. (Stenmark 2001: 20, 133)

The idea that the conceptual core of scientism is the expansion of the natural sciences seems promising to me. After all, both academic and universal scientism claim that the boundaries of the natural sciences should be expanded, either to academic disciplines different from the natural sciences or to other realms of reality. How such an expansion is to be cashed out differs from one variety of scientism to the other. On eliminative academic scientism, for instance, the *methods* of one or several academic disciplines are to be transposed to that of another or several other academic disciplines. And on *epistemological* scientism, the natural sciences are to be expanded in the sense that they should also tell us what to believe about realms of life that seem to be radically different from nature, such as human culture.

Unfortunately, the definition is too strong. Take religious belief. About two centuries ago, the explanation of why people believe in God was not considered to be a proper part of the natural sciences, but rather a proper part of theology.

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During the last few decades, scientists have offered several empirical explanations of belief in God. Justin Barrett, for instance, has argued **(p.47)** that belief in God is the result of a Hyperactive Agency Detection Device, and Deborah Kelemen has argued that people are intuitive theists in that they are born with a strong, although resistible, tendency to give teleological explanations of natural events (Barrett 2012; Kelemen 2004). It seems false, though, to dub these scientific explanations scientistic. Many theists, for instance, have gladly embraced such empirical explanations as giving insight into the mechanisms that God has apparently used to produce belief in him. It seems that such explanations become versions of scientism only if they are debunking in the sense that they are taken to imply that belief in God is an illusion.

1.4.4 A Unifying Definition

Stenmark's definition should be revised in two regards in order to be tenable. First, it should *not* be spelled out in terms of which realms of reality were *previously* considered the domain of science. The history of science displays increasing insight into the proper domain of the sciences. It turned out that that domain was larger than initially thought. What matters, therefore, is not whether something *was* considered to be an autonomous domain, but whether something *is* widely regarded as an autonomous domain. This means that "scientism" is an indexical term; what was once an instance of scientism may no longer be so. Second, it is better to talk about entire "realms of life" and academic disciplines rather than merely "answers to questions." For, as we saw, scientism makes claims not merely about specific questions and answers, but about entire domains. This leads to the following definition:

> Scientism$_4$: The view that the boundaries of the natural sciences should be expanded to include academic disciplines or realms of life that are widely considered *not* to be the domain of science.

Belief in God, for instance, does not fall under "disciplines or realms of life that are widely considered *not* to be the domain of science," for many believers acknowledge that there may well be a good natural explanation of religious belief. Belief in God, after all, should be distinguished from God's existence or the question whether or not God exists.

How precisely we should understand something's "not being the domain of science" differs from the one variety of scientism to the other. When it **(p.48)** comes to *epistemological* scientism, for instance, *X*'s being *not* being the domain of science means that there are nonscientific or maybe even *only* nonscientific ways to acquire knowledge or rational belief about *X*. And in the case of moral scientism, *X*'s not being the domain of science means that the natural sciences cannot replace common-sense morality as a way of dealing with *X* or that natural

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scientific research does not justify the thesis that our moral intuitions and beliefs with regard to *X* are an illusion.

1.5 Conclusions

Let me select what I consider to be the four most important conclusions of this chapter.

First, scientism is the thesis that the boundaries of natural science should be expanded in order to include academic disciplines or realms of life that are widely considered *not* to belong to the realm of science.

Second, every adherent and critic of scientism should make clear which variety of scientism she adheres to or criticizes. In doing so, she should specify whether she is talking about (a) academic or universal scientism; (b) eliminative, methodological, epistemological, ontological, moral, or existential, scientism; (c) full or partial scientism; and (d) in the case of moral and existential scientism: replacement or illusion scientism.

Third, the strongest version of scientism one could defend is a conjunction of the following theses: strong full epistemological scientism, strong full ontological scientism, strong full Illusion-moral scientism, strong Illusion-existential scientism, and strong full eliminative scientism.

Fourth, when it comes to assessing scientism, it makes sense to put partial epistemological scientism center stage, since it is entailed by most other varieties of scientism. On partial epistemological scientism, in a smaller or larger realm of life that goes significantly beyond what are widely considered to be the borders of the natural sciences, only the natural sciences provide rational belief and knowledge.

I have intended throughout this chapter *not* to say anything for or against scientism or some specific version of scientism. I have done that elsewhere (Peels 2016, 2017, 2018). What I have said should be compatible with both a defense and a critique of scientism. It seems to me that the conceptual map of scientism that I have provided in this chapter provides a good starting point providing such a defense or critique. First, it induces every critic and adherent of scientism to make clear which specific variety of scientism she has in mind. Second, it provides insight into which other varieties of scientism **(p.49)** one is committed to defend or criticize in virtue of understanding “scientism” in that particular way.[21]

Appendix

In this Appendix, I defend Figure 1.2, that is, the figure that displays how the varieties of scientism that I distinguished in Figure 1.1 relate to each other.

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1.6 Methodological and Eliminative Academic Scientism

Remember that, on *methodological* scientism, all or some academic disciplines different from the natural sciences should adopt the methods of the natural sciences in order to solve the problems of those fields, whereas on *eliminative* scientism, all or some other academic disciplines are simply reducible to the natural sciences: The problems in those fields are illusory. These are two distinct theses that do not imply each other. Methodological scientism about history as an academic discipline, for instance, says that history should adopt the empirical model of the natural sciences. It does *not* follow that everything historical is a matter of biology, chemistry, or physics. Methodological scientism does not imply any kind of elimination apart from what one could call a methodological elimination. Also, eliminative scientism does not imply methodological scientism. In fact, they exclude each other. If, say, the humanities should adopt the methods of the natural sciences but remain distinct academic disciplines, as methodological scientism implies, then apparently they *should not* be eliminated. Hence, methodological and eliminative scientism are mutually exclusive.

1.7 Academic and Universal Scientism

Clearly, no version of academic scientism implies any kind of universal scientism, for, by definition, academic scientism is restricted to the academy, whereas universal scientism is not. What about the other way around? One **(p.50)** might think universal scientism implies academic scientism *by definition*, because, as I said, universal scientism applies both within and outside of the academy. We should not forget, though, that academic scientism is a claim about *the method* of academic disciplines or whether particular academic discipline should be eliminated, whereas universal scientism is a claim about what we can *know*, what *exists, moral values*, or *meaning*. It cannot be true *by definition*, then, that universal scientism implies academic scientism.

Yet, I *do* think that each variety of universal scientism implies some variety of academic scientism, at least in conjunction with one or two plausible principles. Take partial epistemological scientism. It claims that all possible knowledge about some specific topic that is not normally considered to belong to the realm of natural science, is to be provided by natural science. Such realms could be those of the supernatural, belief and desire attributions, and morality. But it seems right to say that theology, psychology, and ethics also strive for knowledge about respectively God, people’s beliefs and desires, and good and evil. That version of epistemological scientism that says that there is no knowledge to be had in these areas implies eliminative scientism, whereas that version that says that such knowledge is possible, but that only the methods of the natural sciences can deliver such knowledge, implies methodological scientism. If *partial* epistemological scientism has these implications, then, clearly, so does *full* epistemological scientism.

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Does *ontological* scientism also imply some kind of academic scientism? It does, at least in conjunction with some plausible background assumptions. On *full* ontological scientism, only the material cosmos exists that can, in principle, be investigated by science. Consciousness, objective good and evil, beliefs, and so forth, do not exist. That would mean that academic disciplines like philosophical ethics, theology, and psychology need to be given up, for the object of their research would not exist. Hence, full ontological scientism implies eliminative scientism. *Partial* ontological scientism, such as the claim that humans are nothing but molecules, implies *partial* eliminative scientism, for example, eliminative scientism about psychology or philosophical anthropology.

Finally, let us consider moral and existential scientism. If moral scientism says that traditional ethics and common-sense morality should be replaced with a scientific ethics (its R-variety), then ethics should adopt the methods of the natural sciences. And, *mutatis mutandis*, the same applies to existential scientism. On the R-variety of moral and existential scientism, moral and **(p.51)** existential questions are still thought to make sense and, therefore, we should not give up ethics and, say, theology altogether—which would amount to *eliminative* scientism. Rather, these academic disciplines should adopt the methods of the natural sciences, which means that they imply *methodological* scientism. However, even the *full* moral and existential scientism on the R-variety imply at most *partial* methodological scientism, since they do not imply that *all* academic disciplines different from natural science should adopt the methods of natural science.

What about the I-variety of moral and existential scientism? On this variety, morality is an illusion, and meaning and purpose or God is an illusion. The I-variety of *moral* scientism clearly implies partial *eliminative* academic scientism, for if morality is an illusion, then, it seems, we should give up ethics. On the I-variety of *existential* scientism, ultimate meaning and purpose or God or all of these are an illusion. The more of these are an illusion, the more academic disciplines (philosophical ethics, theology) should be given up.

1.8 The Varieties of Universal Scientism

Finally, let us turn toward the relations that hold between the varieties of *universal* scientism.

Let us start with *epistemological scientism*. Clearly, from the thesis that we can know only things by way of natural science, nothing follows about what does or does not exist. It may be that, even if all we can know is the product of natural science, there exist things that we cannot know anything about. Nor does it entail moral or existential scientism, not even on *full* epistemological scientism. From the fact that all knowledge is to be delivered through natural science, it does not follow that morality or God is an illusion, nor that science should provide us with a morality or that it should replace traditional religions. One

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might think, for instance, that science is unable to provide answers to the big questions of life and that we need religions for that, even though they do not provide us with knowledge, but only with helpful answers to live with. Hence, epistemological scientism, whether on its full or partial variety, entails neither ontological, nor moral, nor existential scientism.

What does *ontological* scientism entail? According to Stenmark, ontological scientism entails *epistemological* scientism. For, if the only things that exist are the ones science can in principle discover or the ones that play a role in our **(p. 52)** scientific theories, then the only kind of knowledge we can have is scientific knowledge. Here is how he motivates this claim:

> if something cannot be discovered by science, then we cannot know anything about it either. If, for instance, God cannot be discovered by scientific means, it follows that we cannot know anything about God. We can only know something about people's thoughts about God, because these thoughts are, presumably, real, even though the intended object of these beliefs would not exist. (Stenmark 1991: 18, 24)

This line of reasoning seems somewhat misleading to me. For, the claim that (in some realm) only those things exist that can in principle be investigated by natural science, is perfectly compatible with the claim that we can acquire knowledge about those entities by nonscientific means. Ontological scientism implies at most *partial* epistemological scientism, the idea that in some realms of life only natural science can provide us with knowledge. That will depend, however, on how much one takes the natural sciences to acknowledge to exist. There is good reason to think that the natural sciences do *not* assume or imply certain things to exist that in daily life many of us do believe to exist, such as consciousness, objective good and evil, and God. Given this plausible assumption, we can say that ontological scientism, even full ontological scientism, implies at most *partial* epistemological scientism. If partial ontological scientism about certain areas is correct, then we can have no knowledge about God or consciousness, apart, of course, from knowledge that they do not exist.

Full ontological scientism also implies the I-varieties of moral and existential scientism. If only those things exist that can in principle be investigated by natural science, then, given that natural science does not seem to admit the existence of God, objective meaning, or good and evil, it would follow that morality, God, and objective meaning are illusions. As to *partial* ontological scientism, it seems that as such it does not imply moral or existential scientism. Only those particular versions of it do so that say that there are no objective moral values or that God and objective meaning do not exist, that is, those specific versions that are more or less identical to moral and existential scientism.

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Let us turn to *moral* scientism. Both its R- and I-varieties imply *partial* epistemological scientism. If natural science should replace common-sense ethics, then that is presumably because common-sense ethics does not lead to knowledge. And if morality is an illusion, then nothing can be known about it (again, except for such trivial facts as that it is an illusion). As we **(p.53)** saw, moral scientism on its I-variety implies partial *ontological* scientism. This does not seem to be the case on its R-variety: If science or the methods of the natural sciences should replace traditional ethics, then it is not clear that anything follows about what exists. One might think, for instance, that, for all we know, there are objective moral values, but that we need scientifically construed ethics to know anything about them.

Finally, let us consider *existential* scientism. If there is no God or if there is no objective meaning, as the I-variety says, then we cannot know anything nontrivial about them, so that both partial *ontological* scientism and partial *epistemological* scientism are true. If the R-variety is true, the natural sciences should replace traditional religions and secular ideologies. It would be implausible to claim such a thing while maintaining that knowledge about God through common sense or other mechanisms that are built in human beings is possible.[22] Thus, existential scientism on its R-variety implies partial epistemological scientism. It does *not* imply partial *ontological* scientism, though, for one might think that, for all we know, God exists, but that religions are useless and should be replaced with science.

Does existential scientism imply moral scientism? Stenmark thinks it does, for, "[r]eligions and world views are in general taken to include some ideas about how we should live and what a good human life is" (Stenmark 2001: 19). I think Stenmark is right that most religions also encompass certain ideas about what the good life is. Yet, it does *not* follow that existential scientism implies moral scientism. For, one might think that science should replace traditional religions, with their doctrines about God and life after death, but that we still need common-sense morality. And one might think that God does not exist and that there is no ultimate purpose in life, but that there are still objective facts about what is morally right and wrong. Hence, existential scientism, neither on its R-variety nor on its I-variety, implies moral scientism.

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Notes:

(1.) See, for instance, Haack (2007: 17–18); Rescher (1999: 1); Ross, Ladyman, and Spurrett (2007: 57–59).

(2.) Stevenson and Byerly (1995: 212).

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(3.) For a recent version of his views on the varieties of scientism and how scientism relates to various alternatives, see chapter 2 of this volume.

(4.) Hayek (1979), for instance, treats scientism as a claim about natural science and other academic disciplines.

(5.) Thus also Stenmark (2001: 3).

(6.) See, for instance, Churchland (1987) and Stich (1983). Haack (1995: 158–181) characterizes these two views as *revolutionary scientism*.

(7.) In the same spirit, Stephen Hawking and Leonard Mlodinow open their book *The Grand Design* by asking:

> What is the nature of reality? Where did all this come from? Did the universe need a creator? . . . Traditionally these are questions for philosophy, but philosophy is dead. Philosophy has not kept up with modern developments in science, particularly physics. Scientists have become the bearers of the torch of discovery in our quest for knowledge. (Hawking and Mlodinow 2010: 5)

Hughes (2012: 33) takes *methodological* scientism to be crucial to scientism generally.

(8.) The reader who is familiar with Stenmark's work will notice that I follow him in distinguishing epistemological, ontological, moral, and existential scientism. As we shall see, though, the conceptual map I provide also differs on crucial points from Stenmark's account of scientism.

(9.) For a similar characterization of this version of scientism, see Stenmark (2001: vii–viii). Nielsen (1997: 441), even defines "scientism" entirely along these lines.

(10.) Barbour (1990: 3–5) uses (b) as equivalent with the thesis that the scientific method is the only reliable form of understanding. However, Barbour continues to argue that this view is mistaken. For (b), see Rosenberg (2011: 6).

(11.) This view is sometimes ascribed to Rudolf Carnap on the basis of Carnap (1961: 254; 1967: 290). Carnap, however, makes clear that his claim is limited to questions that are formed from scientific concepts (Carnap 1967: 292). A better example is to be found in Atkins (1995).

(12.) See Russell (1946: 863): "Whatever can be known, can be known by means of science." Russell admits that certain issues are beyond the scope of science, but those issues concern such things as feelings, and in the realm of feelings and values, Russell seems to think, and there is no knowledge to be had.

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(13.) The claim that only natural science provides true *explanations* seems a weaker version of (a). For, this claim can plausibly be interpreted as saying that only natural science provides us with knowledge about *why* some state of affairs obtains.

(14.) For such a conflation, see, for instance, Peterson, Hasker, Reichenbach, and Basinger (1991: 36); Stevenson and Byerly (1995: 212); Quine (1992: 9). And sometimes, we find a blend of epistemological and ontological scientism. According to Wilfrid Sellars, for instance, "in the dimension of describing and explaining the world, science is the measure of all things; of what is that it is and of what is not that it is not." (See Sellars 1963: 173.)

(15.) This is how Peacocke partly characterizes scientism (see Peacocke 1993: 7–8).

(16.) Stenmark (2001: 34) falsely claims that such moral scientism is implied by the project of *sociobiology*. True, many sociobiologists adhere to moral scientism. However, other sociobiologists endorse the project of sociobiology without claiming or even while denying that ethics should or even can be biologized (see, for instance, Ruse 1979: 199–204).

(17.) This is how Stenmark (2001: viii) characterizes existential scientism. This kind of scientism is defended by Wilson (1978: 201–207), who argues that traditional religion and secular ideologies should be replaced with what he calls "scientific materialism."

(18.) For more on this, see Hans van Eyghen, Rik Peels, and Gijsbert van den Brink (2019).

(19.) Radnitzky (1978: 1011) also considers the claim that science is more valuable than other realms of life as a variety of scientism.

(20.) Sorell (1991: 9): "What is crucial to scientism is not the identification of something as scientific or unscientific but the thought that the scientific is much more valuable than the non-scientific, or the thought that the non-scientific is of negligible value." (See also Sorrell 1991: x, 1.)

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(22.) Here, we should think especially of the *sensus* divinitatis, a mechanism, that, according to Alvin Plantinga, God, if he exists, is likely to have implanted in us, in order for us to know him. See especially Plantinga (2000).

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