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WHAT IS SCIENTISM?

Our Western society has been much shaped by scientific thought and discoveries. We not only depend practically on science in our ways of living. Our thinking and attitudes are also shaped by the theories and methods of science. The overwhelming intellectual and practical successes of science that lie behind this impact of science on our culture have led some people to think that there are no real limits to the competence of science, no limits to what can be achieved in the name of science. Or, if there are limits to the scientific enterprise, the idea is that science, at least, sets the boundaries for what we humans can ever achieve or know about reality. There is nothing outside the domain of science, nor is there any area of human life to which science cannot successfully be applied. This view (or similar views) has sometimes been called *scientism*. (It has also been labelled *scientific naturalism* or *scientific materialism*. I will, however, try to show why we should not attribute the same meaning to these three terms.)

Recently, a number of distinguished natural scientists have advocated scientism in one form or another. (The scientists I have in mind in particular are Francis Crick, Richard Dawkins, Stephen Hawking, Carl Sagan, and Edward O. Wilson.) They have sold an enormous number of books. (Hawking's *A Brief History of Time* has, for instance, reached 5.5 million copies.) The views of these scholars have been discussed in newspapers and been broadcast on television. If scientism has been around for a while the great impact these advocates of scientism have had on popular Western culture is new. They have brought not only science but also scientism right into the living room of ordinary people. But of course one need not be a scientist to be a defender of scientism. The view again, in one version or another, is quite popular among philosophers these days.¹ Some politicians can even be viewed as its champions.² This article will focus mainly on the first group.

¹ See, for instance, Paul Churchland, *Scientific Realism and the Plasticity of Mind* (Cambridge: Cambridge University Press, 1979), Daniel C. Dennett, *Consciousness Explained* (New York: Little, Brown, 1991), and Michael Ruse, *Taking Darwin Seriously* (Oxford: Blackwell, 1986).

² Jawaharlal Nehru, the first prime minister of independent India, wrote that: 'It is science alone that can solve the problems of hunger and poverty, of insanitation and illiteracy, of superstition and deadening custom and tradition, of vast resources running to waste, of a rich country inhabited by starving people. ... Who indeed could afford to ignore science today? At every turn we seek its aid. ... The future belongs to science and to those who make friends with science.' Nehru quoted in Tom Sorell, *Scientism* (London: Routledge, 1991), 2.

So we have good reasons for trying to determine more exactly what scientism is. Although the term ‘scientism’ is frequently used, it is often not clear what it signifies. People have in fact given it a number of different meanings. We must therefore distinguish between these different forms of scientism. In this paper I shall explicate some of these conceptions of scientism and relate them to one another.

At least some forms of scientism seem to offer a substitute for traditional religions and thus present science itself as a religion or world view. Another question I will therefore consider is whether scientism and traditional religions (in particular Christianity) are incompatible or if they can be combined in some way. What is the relationship between scientism and a traditional religion such as Christianity? There are also other important questions scientism gives rise to: What are the proper limits of science? Is scientism really science? Is it reasonable to think that science is able to give us salvation, that it can fulfill the role of religion in our lives? What legitimate roles can science play in the formulation of a world view? To consider all of the above questions is naturally beyond the scope of a single article. My aim here is more modest. I will offer some preliminary observations in order to clarify the different meanings the notion of scientism has been given and to plot how these forms of scientism relate to one another and to Christianity.

I. SCIENTISM WITHIN THE ACADEMY

What different meanings has the notion of scientism been given by its advocates and opponents? One way the term has been used is to refer to a program or strategy *within* science or the academy itself. Hence we could call this version of it *academic-internal scientism*. Academic-internal scientism is the attempt to reduce (or translate) an academic discipline into natural science which has not previously been understood as a natural science, or, if that is not attainable, to deny its scientific status or significance (in some way). The defenders of academic-internal scientism all maintain that the boundaries of natural science can be expanded, in one way or another, into fields of inquiry that have not before been considered parts of natural science. The sociobiologist Edward O. Wilson expresses such a view as follows: ‘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 to be included in the Modern Synthesis’.³

Sometimes, however, the reduction (or translation) does not stop there, but continues even within the natural sciences themselves. For instance, not only is, for example, sociology reduced to biology, but biology is also reduced to chemistry, and chemistry to physics.

³ Edward O. Wilson, *On Human Nature* (Cambridge, Mass.: Harvard University Press, 1978), p. 90.

Both of these forms of scientism (let us call the former *academic-internal scientism*₁ and the latter *academic-internal scientism*₂) seem to be endorsed by Francis Crick, the codiscoverer of DNA, who writes that:

eventually one may hope to have the whole of biology ‘explained’ in terms of the level below it, and so on right down to the atomic level ... The knowledge we have already makes it highly unlikely that there is anything that cannot be explained by physics and chemistry.⁴

We can perhaps define ‘academic-internal scientism’ as:

(1) The view that (a) all, or at least some, of the genuine, non-scientific academic disciplines can eventually be reduced to (or translated into) science proper, i.e., natural science (*academic-internal scientism*₁), and that (b) all natural sciences can eventually be reduced to (or translated into) one particular natural science (*academic-internal scientism*₂).

The claim is typically not that it is possible right now to accomplish either (a), or both (a) and (b), but that eventually it will be possible. However, its supporters hold that we do at present possess grounds for believing that this goal is likely to be obtained in the future. Tom Settle says it is ‘a programme, not yet complete, the explanations only promissory notes in some cases, such as the explanation of mentality by neurophysiology’.⁵

1.1 *Methodological Scientism*

One common way of interpreting academic-internal scientism₁ is to understand it as:

(2) The attempt to extend the use of the methods of natural science to other academic disciplines.

Let us call this version, or similar ones, of academic-internal scientism₁, *methodological scientism*. Philip S. Gorski, for example, defines scientism as ‘the attempt to apply the methods of natural science to the study of society’.⁶ And Tom Sorell writes that it is: ‘The thought ... that it is highly desirable for the concepts and methodology of established sciences to be spread, and unsatisfactory for, for example, ethics or history to be left in their prescientific state ... captures the scientism in scientific empiricism’.⁷

The problem, however, with this view of scientism is that it is not really plausible to think that the attempt merely to apply methods of natural

⁴ Francis Crick, *Of Molecules and Men* (Seattle: University of Washington Press, 1966), p. 14 and 98.

⁵ Tom Settle, ‘You Can’t Have Science as Your Religion!’ in I. C. Jarvie and Nathaniel Laor (eds.) *Critical Rationalism, Metaphysics and Science*, Vol. 1. (Dordrecht: Kluwer Academic Publishers, 1995) p. 63.

⁶ Philip S. Gorski, ‘Scientism, Interpretation, and Criticism’ *Zygon*, Vol. 25, No. 3. (1990), p. 279.

⁷ Sorell, *Scientism*, p. 9. See also Helmunt Schoeck and James W. Wiggins (eds), *Scientism and Values* (Princeton: D. van Nostrand Company, 1960), for a collection of essays united by this theme. Helmunt Schoeck writes in the introduction to this volume that ‘the word “scientism” conventionally describes a type of scholarly trespassing, of pseudo-exactitude, of embracing incongruous models of scientific method and conceptualization.’ (p. ix) To some extent Josef Bleicher, *The Hermeneutic Imagination. Outline of a Positive Critique of Scientism and Sociology* (London: Routledge & Kegan Paul, 1982) can also be understood in this way.

science in other academic disciplines would be ‘scientific’. Suppose someone argues for the use of statistics or of inter-subjective procedures (i.e., experimental repeatability) in sociology, and the importance of empirical observations and of mathematics in philosophy – does that make her a defender of scientism? Hardly. We need a stronger requirement than Gorski and Sorell offer to make a claim an example of scientism. However, if the claim is that *only* statistical (and, for example, no hermeneutical) methods are to be used in sociology, then things are clearly different. Or if the idea is that all proper sociological methods *must* yield a result that can be strictly intersubjectively testable (i.e., the study must be repeatable in such way that if somebody else carries out the study a second time in exactly the same way the results must be identical), then this idea can be understood as scientific.

Robert C. Bannister is, therefore, probably correct in classifying a certain view as an expression of scientism if it contains a claim such as ‘a scientific sociology must confine itself to the observable externals of human behaviour ... [He continues, saying that this] goal meant an end to the cataloguing of feelings, interests, or wishes as a principal activity of prewar sociologists’.⁸ Here clearly something more than just the application of some of the methods of natural science is undertaken. What have previously been considered proper objects and methods of sociology are also rejected and replaced. Hence a more appropriate characterization of methodological scientism follows:

(2’) Methodological scientism is the attempt to extend the use of the methods of natural science to other academic disciplines in such way that they exclude (or marginalize) previously used methods considered central to these disciplines.

2. SCIENTISM WITHIN THE BROADER SOCIETY

There are, however, other ways of understanding ‘scientism’ which may or may not be combined with academic-internal scientism. What these other forms of scientism have in common is that they attempt to reduce (or translate) something into science which has *not* previously been understood as science or, if that is not attainable, to deny its significance or possibility. They all maintain that the boundaries of science can be expanded, in one way or another, into non-academic areas of human life (such as art, morality, and religion). They are, therefore, all examples of, what I shall call, *academic-external scientism*. We can define this as:

(3) The view that all or, at least, some of the essential non-academic areas of human life can be reduced to (or translated into) science.

Loren R. Graham, in an influential study, has dubbed views similar to academic-external scientism ‘expansionism’. He writes:

⁸ Robert C. Bannister, *Sociology and Scientism. The American Quest for Objectivity, 1880–1940* (Chapel Hill: University of North Carolina Press, 1987), p. 3.

Expansionists cite evidence within the body of scientific theories and findings which can supposedly be used, either directly or indirectly, to support conclusions about sociopolitical [e.g., moral, political, aesthetic, religious] values. The result of these efforts is to expand the boundaries of science in such a way that they include, at least by implication, value questions.⁹

He defines values as ‘what people think to be good’.¹⁰ In my view, however, Graham unnecessarily limits expansionism (or scientism) to value questions. Hence, the difference between academic-external scientism and expansionism is that the advocate of the former could, but need not like the latter, claim that the boundaries of science can be extended so that it includes values. Instead, she could, for instance, claim that all *beliefs* that can be known, or even rationally maintained, must and can be included within the boundaries of science. So there is a crucial difference between these two concepts not to be overlooked.

Academic-external scientism raises the question of whether there exists any domain or practice-external limits of science.¹¹ Do all the tasks human beings face actually belong to (or are solvable by) science? In its most bold formulation scientism in this form can be taken to maintain that science has no such limits. We will see that there are also weaker versions of academic-external scientism which admit that science has some kind of practice-external limits.

2.1 *Epistemic Scientism*

The first (and probably most common) version of academic-external scientism (or scientism within the broader society) we shall consider consists in the attempt to expand the boundaries of science in such a way that all genuine knowledge must either be scientific or at least be able to be reduced to scientific knowledge. Ian Barbour defines this view as the claim that ‘the scientific method is the only reliable path to knowledge’.¹² Roger Trigg writes that scientism consists of the view that ‘Science is our only means of access to reality’.¹³ Michael Peterson *et al.*, offer a third way of explicating this version of scientism. They write that scientism is ‘the idea that science tells us everything there is to know about what reality consists of ...’.¹⁴ We can call this form of scientism, *epistemic scientism*, and perhaps define it as:

(4) The view that the only reality that we can know anything about is the one science has access to.

The idea is that what lies beyond the reach of scientists cannot count as

⁹ Loren R. Graham, *Between Science and Values* (New York: Columbia University Press, 1981), p. 6.

¹⁰ Graham, *Between Science and Values*, p. 4.

¹¹ See Nicholas Rescher, *The Limits of Science* (Berkeley: University of California Press, 1984) for an excellent discussion of the theoretical limits of science.

¹² Ian Barbour, *Religion in an Age of Science* (New York: Harper & Row, 1990), p. 4.

¹³ Roger Trigg, *Rationality and Science* (Oxford: Blackwell, 1993), p. 90.

¹⁴ Michael Peterson, William Hasker, Bruce Reichenbach, and David Basinger, *Reason and Religious Belief* (Oxford: Oxford University Press, 1991), p. 36.

knowledge. The only sort of knowledge we have is the scientific kind of knowledge. There are no other valid (non-reducible) epistemic activities apart from science. Carnap seems to express this view when he writes that although:

the total range of life still has many other dimensions outside of science, ... within its dimension, science meets no barrier. ... When we say that scientific knowledge is unlimited, we mean: *there is no question whose answer is in principle unattainable by science.*¹⁵

One question of importance for understanding the merits of scientism concerns what academic disciplines should be considered scientific ones. What is *science*? Any discipline within the academy or at the university could, in principle, be called a science. (That is the way the term is typically used in, at least, Swedish and German.) What is characteristic of scientism is that it works with a *narrow* definition of science. Before any reduction or translation has taken place, the advocates of scientism use the notion of science to cover only the natural sciences and perhaps also those areas of the social sciences that are highly similar in methodology to the natural sciences. How broad the definition in the end will be (when the programme is completed) is a matter of how many academic disciplines one thinks could be successfully turned into a natural science.

Thus a claim like ‘All knowledge is scientific’ should be interpreted to mean that we cannot know anything about reality which is not knowable (either directly or after translation) by the methods of inquiry of the natural sciences. We can also see why this is a reasonable way of understanding scientism if we consider the most common philosophical criticism of it, namely that a scientific claim like ‘All knowledge is scientific’ is not itself a scientific but a philosophical claim and is consequently not itself knowable. If science were defined by the advocates of scientism in such a way philosophy is considered a part of science proper, this criticism would lose its point, and of course, scientism would also lose its point; it would not be a very controversial view. Such a scenario does justice neither to scientism nor its opponents. I am therefore inclined to think that a narrow definition of science is a necessary condition for a view counting as scientism.

2.2 *Rationalistic Scientism*

It is not always recognised that it is also possible to maintain a stronger epistemological version of scientism than the above epistemic one. Epistemic scientism only denies that any claim or belief that cannot be scientifically knowable can constitute knowledge. We cannot know anything about reality which transcends the limits of science. Now, many people have some religious beliefs. Let us suppose that their truth cannot be scientifically proved; can these people still be rational in accepting these beliefs? An advocate of

¹⁵ Rudolf Carnap, *The Logical Structure of the World* (Berkeley: University of California Press, 1967), p. 290.

epistemic scientism as defined thus far could accept that. All she is, in fact, claiming is that we cannot *know* whether these beliefs are true. From this proposition alone it does not follow that we are not *rational* in accepting them. What is not scientifically knowable might still be rationally believable. Nevertheless epistemic scientism and what I shall style *rationalistic scientism* are sometimes confused because it is not recognized that knowledge and rationality are two distinct concepts. (Epistemic scientism could only entail rationalistic scientism if these two concepts were shown to be identical.) It is, however, fairly easy to see that the conditions for knowledge and for rationality cannot be the same. In general we think that people 2000 years ago were rational in believing that the earth was flat (their believing satisfying the conditions for rationality), but we would not say that they knew that it was flat (their believing satisfying the conditions for knowledge). If they knew, it follows that the shape of the earth must have changed since then. Hence the conditions for knowledge and rationality cannot be the same.¹⁶ Consequently, one can be rationally entitled to believe things that are not scientifically knowable.

Therefore, a stronger epistemological version of scientism than epistemic scientism can be maintained. In fact, Anders Jeffner seems to define scientism along these lines. He writes that the advocate of scientism ‘accepts as reasons for what one should believe about reality (a) reasons such as those acceptable within empirical natural science and (b) only such reasons!’¹⁷ On such an account science not only sets the limits for what we can know about reality, but also sets the boundaries for what is rational to believe. We have styled this version of scientism *rationalistic scientism* and can now define it as:

(5) The view that we are rationally entitled to believe only what can be scientifically proved or what is scientifically knowable.

Bertrand Russell, for instance, betrays the commitment not only to epistemic but also rationalistic scientism when he writes that:

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. I do not pretend to be able to prove that there is no God. I equally cannot prove that Satan is a fiction. The Christian God may exist; so may the Gods of Olympus, or of ancient Egypt, or of Babylon. But 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.*¹⁸

¹⁶ See my book *Rationality in Science, Religion, and Everyday Life. A Critical Evaluation of Four Models of Rationality* (Notre Dame: The University of Notre Dame Press, 1995), pp. 216–225, for a detailed discussion of the differences between knowledge and rationality.

¹⁷ Anders Jeffner, *Livsåskådningsforskning* [Life-View Studies], (research rapport) (Uppsala, 1978), p. 46, my translation.

¹⁸ Bertrand Russell, *Why I Am Not a Christian* (London: Unwin Paperbacks, 1957), p. 44 (emphasis added).

So, according to Russell, central Christian dogmas do not merely fail to be scientifically knowable, there is not even any reason to consider them at all. We are thus not rationally justified in believing them either. To show that a (religious) belief is not scientific is, on such an account, also sufficient for showing that it is neither knowable nor rationally believable.

Note, however, that defenders of both epistemic scientism and rationalistic scientism accept that science has *some* practice-external limits. They can admit that there are other kinds of questions and enterprises beside scientific ones. They can maintain this point because it does not follow from the claim that there can be no knowledge or no rational beliefs in the spheres of life outside science that these other realms are unimportant or less valuable than science. It might be accepted that human beings do not live by knowledge alone, other valid and important human activities exist and are necessary for our flourishing. It might further be accepted that science cannot set the limits for what exists. For example, God or a Divine Reality might exist. The point according to some is merely that we cannot know (epistemic scientism) or rationally believe (rationalistic scientism) anything about such a reality.

2.3 *Ontological Scientism*

A more ambitious form of scientism, *ontological scientism*, does not merely state that the only reality that we can know (or can rationally believe) anything about is the one science has access to. It maintains further that only the reality science can discover exists. Hence, scientism can involve a claim about what kind of things exist ‘out there’. We can define ontological scientism as:

(6) The view that the only reality that exists is the one science has access to.

Reality is what science says it is. Only entities, causes, or processes with which science deals are real, period. Ontological scientism thus entails epistemic scientism because we could not know anything about what does not exist! We cannot know something about a reality to which science does not have access, because there is simply no such reality.

One way of stating ontological scientism is to maintain that nothing but atoms or material particles exist in the world. This is the idea that the only entities and causes in the world are material objects. Wilson frankly calls this view ‘scientific materialism’.¹⁹ Carl Sagan also writes, seemingly in the name of science, that:

I am a collection of water, calcium and organic molecules called Carl Sagan. You are a collection of almost identical molecules with a different collective label. But is that all? Is there nothing in here but molecules? Some people find this idea somehow demeaning to human dignity. For myself, I find it elevating that our universe permits

¹⁹ Wilson, *On Human Nature*, p. 201.

the evolution of molecular machines as intricate and subtle as we. But the essence of life is not so much the atoms and simple molecules that make us up as the way in which they are put together.²⁰

Sagan apparently thinks that science has shown us that the only things that exist are material objects and their interactions. We are consequently merely ‘molecular machines’ which are not essentially different from artefacts (i.e., machines). Sagan further claims that: ‘The Cosmos is all that is or ever was or ever will be’.²¹ All this, Sagan thinks, is scientifically knowable, not perhaps when the scientific project will be fully developed or completed, but right here and now. Crick calls these ideas the ‘Astonishing Hypothesis’:

The Astonishing Hypothesis is that ‘You’, your joys and your sorrows, your memories and your ambitions, your sense of identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules. As Lewis Carroll’s Alice might have phrased it: ‘You’re nothing but a pack of neutrons’. This hypothesis is so alien to the ideas of most people alive today that it can truly be called astonishing.²²

The ideas of most people have, according to Crick, unfortunately been shaped by pre-scientific illusions of religion, but only science in the long run can free us from the superstitions of our ancestors.

Many people think in the light of statements such as these that scientism and traditional religions such as Christianity and Islam are necessarily incompatible. John F. Haught says that ‘it may not be science but *scientism* that is the enemy of religion [i.e., theism in this case]’.²³ Scientism claims that science tells us everything there is to know about reality; it even tells us what can exist, therefore, religion is seriously undermined or even superfluous. But it is important to notice that this is not necessarily the case.

Recall that there are forms of scientism which admit that science has some practice-external limits. They accept that there are other valid questions and enterprises besides science. Hence, if religion is taken to deal essentially with value questions, religion and scientism (in these forms) can be compatible.²⁴

Of course, many believers are not satisfied with such a ‘narrow’ conception of religion. (Nor is Haught for that matter.) They claim that God really exists and that we can know (or at least are rationally entitled to believe) that God is love, and so on. Is not such a ‘broad’ conception of religion then incompatible with scientism? After all, scientism denies that it is possible to obtain knowledge of God or of a Divine Reality (epistemic scientism) and that there exists a transcendent (or non-physical) reality beyond the physical

²⁰ Carl Sagan, *Cosmos* (New York: Ballantine Books, 1980), p. 105.

²¹ Sagan, *Cosmos*, p. 1.

²² Francis Crick, *The Astonishing Hypothesis: The Scientific Search for the Soul* (New York: Charles Scribner’s Sons, 1994), p. 3.

²³ John F. Haught, *Science and Religion* (New York: Paulist Press, 1995), p. 17.

²⁴ See R. B. Braithwaite, ‘An Empiricist’s View of the Nature of Religious Belief’ in Basil Mitchell (ed.) *The Philosophy of Religion* (London: Oxford University Press, 1971) for a classic defence of this view and Eberhard Herrmann, *Scientific Theory and Religious Belief. An Essay on the Rationality of Views of Life* (Kampen: Kok Pharos, 1995) for more contemporary one.

universe (ontological scientism). But to the contrary, scientism does not *necessarily* deny these things. While Dawkins, Sagan, Wilson, and others think along these lines they could be wrong on *scientific* grounds. This is possible because all scientism claims is that religious beliefs must satisfy the same conditions as scientific hypotheses to be knowable, rationally believable, or real. Hence, people like Dawkins, Sagan, and Wilson take for granted that religious beliefs *cannot* meet these requirements, but this could of course be questioned.

Richard Swinburne, among others, argues that theism *can* be confirmed by evidence in much the same way that evidence supports scientific hypotheses. There exist close similarities between religious theories and large-scale scientific theories.²⁵ Just as science explains phenomena with hypotheses about atoms, genes, forces, etc., theism explains why the universe exists and why it looks the way it looks. Swinburne accordingly writes: ‘The structure of a cumulative case for theism was thus, I claimed [in *The Existence of God*], the same as the structure of a cumulative case for any unobservable entity, such as a quark or a neutrino’.²⁶ Only when one can show that the Swinburnian project (or similar ones) is doomed to fail either because it cannot deliver what it promises or because it misrepresents religious belief (or for some other reason), does (a rich conception of) theism become incompatible with (epistemic, rationalistic, or ontological) scientism.

Hence, scientism cannot right a way be equated with *scientific naturalism* or *scientific materialism*. Given that these are understood as, roughly, the views that:

- (a) matter or physical nature alone is real (all phenomena are merely configurations of matter), and that
- (b) everything that exists (life, mind, morality, religion, and so on) can be completely explained in terms of matter or physical nature.

This is so because an advocate of either epistemic, rationalistic, or ontological scientism need not endorse these views. Another way of putting this is to say that scientific materialism or naturalism only leaves open the possibility that God could exist if he/she/it is identical with the physical world, and hence closes the door for traditional theism or process theism. We have seen, however, that although perhaps epistemic, rationalistic, and ontological scientism often do have such implications, that is not necessarily so.

2.4 *Axiological Scientism*

Yet another form of scientism is distinguished by Sorell who defines it as ‘the belief that science, especially natural science, is much the most valuable part of human learning ...’.²⁷ He continues: ‘What is crucial to scientism is not

²⁵ Richard Swinburne, *The Existence of God* (Oxford: Oxford University Press, 1979), p. 3.

²⁶ Swinburne, ‘Mackie, Induction, and God’ *Religious Studies*. Vol. 19, (1983), p 386.

²⁷ Sorell, *Scientism*, p. 1.

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'.²⁸ Gerard Radnitzky understands scientism in a similar way. He writes that 'the distinction between science and non-science by no means implies that other activities, other realms of life, are less valuable. To draw such a conclusion would be a sure symptom of scientism, a most unscientific attitude'.²⁹

The claim Sorell and Radnitzky identify as scientism is different from the versions of scientism we have discussed so far in that it has nothing to do with knowledge or ontology directly, but deals instead with value questions. Let us, therefore, call this form of scientism or any form that deals with values, *axiological scientism*. Sorell and Radnitzky claim that we should define this form of scientism as something like:

(7) The view that science is the most valuable part of human learning or culture.

It might be true that it is not a scientific conclusion to say that other realms of life are 'less valuable' as Radnitzky writes, or even 'much more valuable' as Sorell, but is it reasonable to interpret such statements as expressions of scientism? Suppose one thinks that science is more valuable than art, literature, philosophy, politics, or sports. Does that make one's view scientific? This is true, I would say, only if these and other human activities are of almost no value or, as Sorell also says, of 'negligible' value. Hence it is one thing to claim that science is (much) more valuable than non-scientific realms of human life and another to propose that the non-scientific realms are of very little or no value at all. Sorell and Radnitzky are thus guilty of conflating (a) believing that science should be valued higher than other human activities and (b) believing that non-scientific activities are of little value. Scientism then involves a *depreciation* (or an underestimation as the critics would say) of the non-scientific realms of life. Hence a better way of defining axiological scientism is:

(7') The view that science is the only truly valuable realm of human life. All other realms are of negligible value.

Sorell also maintains that views of morality like those of Edward O. Wilson and Michael Ruse are scientific.³⁰ Ruse's view represents a form of scientism because he claims that 'on the basis of [a Darwinian] factual theory about the nature and process of evolution, you can provide a total explanation of morality'.³¹ His basic idea seems to be that morality is an evolutionary mechanism that promotes the survival of our genes, no more no

²⁸ Sorell, *Scientism*, p. 9.

²⁹ Gerard Radnitzky, 'The Boundaries of Science and Technology' in Proceedings of the Sixth Internal Conference on the Unity of the Sciences, *The Search for Absolute Values in a Changing World, Vol. II* (New York: The Internal Cultural Foundation Press, 1978), p. 1011.

³⁰ Sorell, *Scientism*, p. 166.

³¹ Michael Ruse, *Taking Darwin Seriously* (Oxford: Blackwell, 1986), p. 256.

less. Wilson writes that ethics will be explained and eventually replaced by biological knowledge. Now science can ‘search for the bedrock of ethics – by which I mean the material basis of natural law’. ‘Morality has no other demonstrable ultimate function [than to keep the genes intact]’.³²

If these views are scientific, they are clearly not examples of axiological scientism as Sorrell defines it above since they do not claim that science is the only truly valuable realm of human life. Perhaps Ruse and Wilson also maintain (7’), but it seems quite possible to defend the form of scientism identified here and deny (7’). That is, one could claim that science can fully explain and provide answers to our moral questions without claiming that the non-scientific realms are of negligible value. This means that there are at least two forms of axiological scientism. Let us call (7’) *axiological scientism*₁ and the one identified here, *axiological scientism*₂. We can define the latter in the following way:

(8) The view that science can completely explain morality and replace traditional ethics.

Ethics can be reduced to or translated into science. However, for a claim to be scientific in this sense, it must maintain more than that science (the theory of evolution in this case) is relevant to ethics. Nobody would deny that. It must rather state that science is the sole, or at least by far the most important, source for developing a moral theory and explaining moral behavior. In this case the appropriate claim is that the morally correct way to conduct one’s life is something that can be derived exclusively from the theory of evolution (or science more broadly speaking).

What is the relation of these forms of scientism to the ones we have already identified? For one thing, *axiological scientism*₂ does not necessarily entail epistemic, rationalistic, or ontological scientism. One could claim that science can explain morality completely and replace traditional ethics, without maintaining that the only reality we can know anything about is the one science has access to, that we are rationally entitled to believe only what is scientifically knowable, or that the only reality that exists is the one science has access to.

With regard to *axiological scientism*₁ things are a little bit less straight forward. It seems logically possible to claim that science is the only really valuable realm of human life, that other realms are of negligible value, and deny, for instance, that the only reality we can know anything about is the one science has access to. However, if we can have non-scientific knowledge, that would be an argument for thinking that the areas in which we can possibly attain this knowledge are of some (and thus not necessarily of negligible) value. Put another way, the belief that the only kind of knowledge accessible to us is scientific knowledge constitutes reason for thinking

³² Wilson, *On Human Nature*, pp. 90 and 167.

that only science is of true importance in human life. This is especially so if one accepts both forms of axiological scientism. If science can provide both knowledge and values, perhaps we do not have to consider any other realms of life significant.

2.5 *Redemptive Scientism*

Some scientists seem to have an almost unlimited confidence in science – especially in their own discipline – and about what could be achieved in the name of science. Richard Dawkins says that since we have modern biology: ‘We no longer have to resort to superstition when faced with the deep problems: Is there a meaning to life? What are we for? What is man?’³³ According to him science is capable of dealing with all these questions and constitutes in addition the only alternative to superstition. Science, he says, tells us that:

We are machines built by DNA whose purpose is to make more copies of the same DNA... That is EXACTLY what we are for. We are machines for propagating DNA, and the propagation of DNA is a self-sustaining process. It is every living object’s sole reason for living...³⁴

Stephen Hawking maintains that scientific cosmological theory will help us answer the question ‘why we are here and where we came from. ... And the goal is nothing less than a complete description of the universe we live in’. In the end we will, with the tools of science, even ‘understand the mind of God’.³⁵

This could not mean anything less, it seems, than that Dawkins and Hawking think that science is able to offer us salvation, to fulfill the role of religion in our lives. We can and must put our faith in science. This is also the way Mary Midgley understands scientism. She writes that scientism is ‘the idea of *salvation through science alone*’. Science is in ‘the business of providing the faith by which people live’.³⁶ We can perhaps call this form of scientism, *redemptive scientism*, and define it as:

(9) The view that science alone is sufficient for dealing with our existential questions or for creating a world view by which we could live.

Another writer who expresses a belief in the ‘salvific’ mission of science is Wilson. He claims that traditional religion (and ethics) will be *explained* and eventually *replaced* by biological knowledge:

let me give again the reasons why I consider the scientific ethos superior to religion: its repeated triumphs in explaining and controlling the physical world; its self-correcting nature open to all competent to devise and conduct the tests; its readiness to examine all subjects sacred and profane; and now the possibility of explaining

³³ Richard Dawkins, *The Selfish Gene* (Oxford: Oxford University Press, 1989 (2nd ed) [1976]), p. 1.

³⁴ Dawkins quoted in Michael, W. Poole, ‘A Critique of Aspects of the Philosophy and Theology of Richard Dawkins’ *Science & Christian Belief*, Vol. 6. No. 1, (1994), p. 58.

³⁵ Stephen, W. Hawking, *A Brief History of Time* (London: Bantam Press, 1988), pp. 13 and 175.

³⁶ Mary Midgley, *Science as Salvation* (London: Routledge, 1992), pp. 37 and 57.

traditional religion by the mechanistic models of evolutionary biology. The last achievement will be crucial. If religion, including the dogmatic secular ideologies, can be systematically analyzed and explained as a product of the brain's evolution, its power as an external source of morality will be gone forever...³⁷

(Perhaps one may be excused for wondering why science itself is not discredited by the same 'logic.' Is it not also a product of the brain's evolution? And will not science's power as a source of knowledge then also be gone forever once we realize this?) Wilson posits that science has shown that religious beliefs 'are really enabling mechanisms for survival', and apparently nothing more. Science can explain religion as 'a wholly material phenomenon'.³⁸ In the place of religion Wilson thinks we should put something he variously styles 'scientific materialism,' 'scientific naturalism', or 'scientific humanism'.³⁹ This is, as I mentioned above the view that matter or physical nature alone is real (all phenomena are merely configurations of matter) and that everything that exists (life, mind, morality, religion, and so on) can be completely explained in terms of matter or physical nature. Scientific materialism can, therefore, also answer, among other things, our existential questions: It can tell us why we are here, where we come from, and where we are going. Since there are really no differences between science and scientific materialism, science can be, and *should* be, our religion, or as I prefer to say, view of life. As I have already argued elsewhere, for something to be a view of life it must satisfy certain requirements.⁴⁰ Is redemptive scientism in the form of scientific materialism able to do this?

A view of life must fulfill, at least, two tasks. First, it must structure and make reality intelligible (the *theoretical function of a view of life*). That is, it must to some degree make the world a cosmos and determine the place of human beings in it, and also state what is of value in life. Second, a view of life must concretely guide people in how they should live their lives, how they should deal practically with their existential experiences of, for instance, meaninglessness, suffering, guilt, and love and their interpersonal relationship with other human beings (the *regulative function of a view of life*). This is so because believing in a view of life is not just a matter of seeing the world in a particular way, but also a matter of choosing a way of living.

Scientific materialism is able to fulfill the theoretical task. It provides its adherents with a map of reality. It tells us where human beings fit in and what the central values of our existence are. It is less certain whether scientific materialism can concretely regulate people's lives in the way traditional religions have been able to do. Wilson himself seems to be aware of this problem. The 'fatal deterioration of the myths of traditional religion' has led to 'a loss of moral consensus, a greater sense of helplessness about the

³⁷ Wilson, *On Human Nature*, p. 201.

³⁸ Wilson, *On Human Nature*, pp. 3 and 192.

³⁹ Wilson, *On Human Nature*, pp. 201 and 206.

⁴⁰ I do not have the space here to argue why these requirements must be fulfilled. For such an account see Stenmark, *Rationality in Science, Religion, and Everyday Life*, chapters 9 and 10.

human condition and a shrinking of concern back toward the self and the immediate future'.⁴¹ Scientific materialism must face this challenge. It must supply people with a new myth powerful enough to overcome these destructive consequences of the deterioration of traditional religious myths. It must be able to provide a faith by which people actually could live, not only with a theoretical map of reality. Scientific materialism must not merely be a vision *of* life but be a vision *for* life. Wilson thus suggests:

a modification of [traditional] scientific humanism through the recognition that the mental processes of religious belief – consecration of personal and group identity, attention to charismatic leaders, mythopoeism, and others – represent programmed predispositions whose self-sufficient components were incorporated into the neural apparatus of the brain by thousands of generations of genetic evolution. As such they are powerful, ineradicable, and at the center of human social existence. ... I suggest further that scientific materialism must accommodate them on two levels: as a scientific puzzle of great complexity and interest, and as a source of energies that can be shifted in new directions when scientific materialism itself is accepted as the more powerful mythology.⁴²

However, it is not possible now to predict the form religious life and rituals will take as 'scientific materialism appropriates the mythopoeic energies to its own ends'.⁴³ So our conclusion must be that redemptive scientism in the form of scientific materialism is indeed a full-fledged view of life (or at least it has the potentiality and ambition to be one).⁴⁴

In this form scientism is in competition with traditional religions. Religion cannot only be *explained* by science, it can also be *replaced* by science. And in this particular form, scientism is equivalent to scientific materialism or scientific naturalism.⁴⁵

2.6 *Comprehensive Scientism*

Although I have shown that one can accept a particular form of scientism without necessarily being committed to the other forms, it is of course possible to accept more or less the whole package. This is also the way scientism sometimes is understood. Radnitzky maintains that: 'Scientism is roughly 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.'⁴⁶ Arthur Peacocke writes:

The tendency of science to imperiousness in our intellectual and cultural life has been dubbed 'scientism' – the attitude 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.⁴⁷

⁴¹ Wilson, *On Human Nature*, p. 195.

⁴² Wilson, *On Human Nature*, pp. 206–207.

⁴³ Wilson, *On Human Nature*, p. 206.

⁴⁴ Whether it is science is of course another matter.

⁴⁵ Although now when the 'naturalizing' of epistemology, ethics, etc., is so popular in philosophy we have to be extra careful with how we understand the latter notion.

⁴⁶ Radnitzky, 'The Boundaries of Science and Technology,' p. 1008.

⁴⁷ Arthur Peacocke, *Theology for a Scientific Age* (Minneapolis: Fortress Press, 1993), pp. 7–8.

The important thing to focus on is the last part of Peacocke's statement: science alone can solve all our personal and social problems. All our personal, social, theoretical, practical, moral, existential, psychological (you name it) problems are soluble by science alone.

Perhaps this is also the way we should understand Settle when he writes that the hallmark of scientism (such as Wilson's scientific materialism) 'is to translate everything into science's terms, as far as it will go – and dump the rest ... [E]verything not within science is to be reduced to science ...'.⁴⁸

Let us call this form of scientism, *comprehensive scientism*, and define it as the view that:

(10) Science alone can and will eventually solve all, or almost all, of our genuine problems.

It is perhaps necessary to give a few comments about the meaning of (10). First, it is not merely that science can solve all these problems. Science now needs no help from any other human practice to do it. Is only science that is able to undertake this task.

Second, comprehensive scientism in its most ambitious formulation (claiming that science can solve all, and not just almost all, of our problems) contains probably all other forms of scientism we have identified. If science alone can deal with all our moral problems, it seems to entail axiological scientism₂. If it can alone solve all our problems, the other realms of human life seem to be of negligible value (axiological scientism₁). If only science can give an answer to all our theoretical and practical questions, it seems to embrace epistemic scientism. It is likely, but not strictly necessary, that comprehensive scientism would then also include rationalistic scientism. If science can solve any problem we face, it is probably because what science cannot discover does not exist (ontological scientism). And since science alone can solve all our problems, the non-scientific academic disciplines must be transformed into natural sciences (academic internal scientism₁). The only form of scientism comprehensive scientism may or may not include is academic-internal scientism₂, that is, the claim the natural sciences themselves can be reduced to one particular natural science.

Third, the qualification 'eventually' is important because the claim could hardly be that contemporary science, or even science within a nearby future, will be able to solve our problems. Instead it must be what we could call *complete science* (that is, what science would be when the scientific project has been carried through to completion and perfection) that will be able to do that.⁴⁹

Finally, a second qualifier is necessary to express appropriately the claim of comprehensive scientism: science only solves the problems that are 'legitimate' or 'genuine'. There is, as Settle pointed out above, a tendency among

⁴⁸ Settle, 'You Can't Have Science as Your Religion!' p. 63.

⁴⁹ Rescher, *The Limits of Science*, pp. 3–4.

the advocates of comprehensive scientism to dismiss everything that cannot be translated into the terms of science. There is an inclination to deny that those problems are genuine or significant and to claim instead that they are pseudo-problems or unimportant problems.

3. SUMMARY

I have tried to show that scientism comes in a variety of different forms. We first have to distinguish between scientism within the academy (academic-internal scientism) and scientism within the broader society (academic-external scientism). We made a distinction between two versions of the former (academic internal scientism₁ and academic internal scientism₂). The first is the view that all, or at least some, of the genuine, non-scientific academic disciplines can eventually be reduced to science proper, i.e., natural science. To this the second adds that all natural sciences can eventually be reduced to one particular natural science.

Among the versions of academic-external scientism we identified epistemic scientism (the view that the only reality that we can know anything about is the one science has access to), rationalistic scientism (the view that we are rationally entitled to believe only what can be scientifically proven or what is scientifically knowable), ontological scientism (the view that the only reality that exists is the one science has access to), and redemptive scientism (the view that science alone is sufficient for dealing with our existential questions or for creating a world view by which we could live). Further, two forms of axiological scientism were distinguished. The first claiming that science is the only truly valuable realm of human life, the second that science can completely explain morality and replace traditional ethics.

We have also seen that these different forms of scientism can be combined in a number of different ways. I called the most ambitious combination ‘comprehensive scientism’ because it contains all or almost all of these different forms of scientism. It claims that science alone can and will eventually solve all, or almost all, of our genuine problems.

In short, a narrow definition of science (when science is identified merely with the natural sciences) plus any of the versions (1) to (10) above would turn a claim into scientism.

This variety of forms of scientism also shows that we should not equate scientism with scientific naturalism or scientific materialism because there are other possible forms of scientism that do not entail an acceptance of scientific materialism or naturalism. This variety among versions of scientism also demonstrates that the relation between scientism and a traditional religion such as Christianity is not a given. Only between redemptive scientism and traditional religions is there a direct conflict. Other forms of scientism may or may not be compatible with traditional religions.

Two further questions of importance are whether it is indeed reasonable to think that science can be one's religion and whether scientism really is science. I hope to return to these in a future paper.⁵⁰

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