



The Philosophy Page

Methodological Naturalism?*

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Unmatched for sweep and eloquence, St. Augustine's *De Civitas Dei* is a magnificently powerful expression of a view of human history that has been taken up by a host of later Christians.¹ According to that view, human history involves a struggle, a contest, a battle between what he calls the *Civitas Dei*, the City of God, on the one hand, and, on the other, the City of the World or the City of Man. The former is devoted to the worship and service of the Lord; the latter serves quite a different master. Augustine believes that all of human history is to be understood in terms of this struggle, and nearly any cultural endeavor of any size or significance is involved in it. Now modern natural science is an enormously important aspect of contemporary intellectual life. There are of course those naysayers who see in it no more than technology, no more than a means of serving such practical ends as fighting disease and building bridges or space vehicles. But surely they are wrong. Science has indeed done these important things, but it has done more: it has also given us powerful insights into ourselves and into the world God has created. Science has transformed our intellectual landscape; it is difficult even to imagine what our intellectual life would be without it. If we follow Augustine, we should therefore expect that science, too, plays an important role in the contest he describes.

According to an idea widely popular ever since the Enlightenment, however, science (at least when properly pursued) is a cool, reasoned, wholly dispassionate² attempt to figure out the truth about ourselves and our world, entirely independent of ideology, or moral convictions, or religious or theological commitments. Of course this picture has lately developed some cracks. It is worth noting, however, that sixteen centuries ago Augustine provided the materials for seeing that this common conception cannot really be correct. It would be excessively naive to think that contemporary science is religiously and theologically neutral, standing serenely above that Augustinian struggle and wholly irrelevant to it. Perhaps *parts* of science are like that: the size and shape of the earth and its distance from the sun, the periodic table of elements, the proof of the Pythagorean Theorem - these are all in a sensible sense religiously neutral. But many other areas of science are very different; they are obviously and deeply involved in this clash between opposed worldviews. There is no neat recipe for telling which parts of science are neutral with respect to this contest and which are not, and of course what we have here is a continuum rather than a simple distinction. But here is a rough rule of thumb: the relevance of a bit of science to this contest depends upon how closely

that bit is involved in the attempt to come to understand ourselves as human beings. Perhaps there is also another variable: how theoretical the bit in question is, in the sense of being directed at *understanding* as opposed to control.

It would be of great interest to explore this area further, to try to say precisely what I mean in saying that science is not religiously neutral, to see in exactly what ways Christianity bears on the understanding and practice of the many relevantly different sciences and parts of science. The first is not the focus of this paper, however; and the second question (of course) requires vastly more knowledge of science than I can muster. That is a question not just for philosophers, but for the Christian community of scientists and philosophers working together. What I shall do instead is vastly more programmatic. I shall argue that a Christian academic and scientific community ought to pursue science in its own way, *starting from* and taking for granted what we know as Christians. (This suggestion suffers from the considerable disadvantage of being at present both unpopular and heretical; I shall argue, however, that it also has the considerable advantage of being correct.) Now one objection to this suggestion is enshrined in the dictum that science done properly necessarily involves methodological naturalism or (as Basil Willey calls it) provisional atheism.³ This is the idea that science, properly so-called, cannot involve religious belief or commitment. My main aim in this paper is to explore, understand, discuss, and evaluate this claim and the arguments for it. I am painfully aware that what I have to say is tentative and incomplete, no more than a series of suggestions for research programs in Christian philosophy.

Weak Arguments for Methodological Naturalism

The natural thing to think is that (in principle, at any rate) the Christian scholarly community should do science, or parts of science, in its own way and from its own perspective. What the Christian community really needs is a science that takes into account what we know as Christians. Indeed, this seems the rational thing in any event; surely the rational thing is to use *all* that you know in trying to understand a given phenomenon. But then in coming to a scientific understanding of hostility, or aggression, for example, should Christian psychologists not make use of the notion of sin? In trying to achieve scientific understanding of love in its many and protean manifestations, for example, or play, or music, or humor, or our sense of adventure, should we also not use what we know about human beings being created in the image of God, who is himself the very source of love, beauty, and the like? And the same for morality? Consider that enormous, and impressive, and disastrous Bolshevik experiment of the twentieth century, perhaps the outstanding feature of the twentieth century political landscape: in coming to a scientific understanding of it, should Christians not use all that they know about human beings, including what they know by faith?

True: there could be *practical* obstacles standing in the way of doing this; but in principle, and abstracting from these practical difficulties (which in any event may be more bark than bite), the right way for the Christian community to attain scientific understanding of, say, the way human beings are and behave, would be to start from what we know about human beings, including what we know by way of faith. Hence the sorts of hypotheses we investigate might very well involve such facts (as the Christian thinks) as that we human beings have been created by God in his image, and have fallen into sin. These religious ideas might take a place in our science by way of explicitly entering various hypotheses. They might also play other roles: for example, they might be part of the background information with respect to which we evaluate the various scientific hypotheses and myths that come our way.

I say this is the natural thing to think: oddly enough, however, the *denial* of this claim is widely taken for granted; as a matter of fact, it has achieved the status of philosophical orthodoxy. Among those who object to

this claim are Christian thinkers with impressive credentials. Thus Ernan McMullin:

But, of course, methodological naturalism does not restrict our study of nature; it just lays down which sort of study qualifies as *scientific*. If someone wants to pursue another approach to nature - and there are many others - the methodological naturalist has no reason to object. Scientists *have* to proceed in this way; the methodology of natural science gives no purchase on the claim that a particular event or type of event is to be explained by invoking God's creative action directly.⁴

Part of the problem, of course, is to see more clearly what this methodological naturalism *is*. Precisely what does it come to? Does it involve an embargo only on such claims as that a particular event is to be explained by invoking God's creative action *directly*, without the employment of secondary causes? Does it also proscribe invoking God's *indirect* creative action in explaining something scientifically? Does it pertain only to scientific *explanations*, but not to other scientific assertions and claims? Does it also preclude using claims about God's creative action, or other religious claims as part of the background information with respect to which one tries to assess the probability of a proposed scientific explanation or account? We shall have to look into these matters later. At the moment however, I want to look into a different question: what reason is there for accepting the claim that science does indeed involve such a methodological naturalism, however exactly we construe the latter? I shall examine some proposed reasons for this claim and find them wanting. I shall then argue that nevertheless a couple of very sensible reasons lie behind at least part of this claim. These reasons, however, do not support the suggestion that science is religiously neutral.

...proper science, as seen by the Enlightenment, is restricted to the deliverances of reason and sense (perception) which are the same for all people.

Well then, what underlies the idea that science in some way necessarily involves this principle of methodological naturalism? First, and perhaps most important: this conception of science is an integral and venerable part of the whole conception of faith and reason we have inherited from the Enlightenment. I do not have the space to treat this topic with anything like the fullness it deserves; but the central idea, here, is that science is objective, public, sharable, publicly verifiable, and equally available to anyone, whatever their religious or metaphysical proclivities. We may be Buddhist, Hindu, Protestant, Catholic, Muslim, Jew, Bahai, none of the above: the findings of science hold equally for all of us. This is because proper science, as seen by the Enlightenment, is restricted to the deliverances of *reason* and *sense* (perception) which are the same for all people. Religion, on the other hand, is private, subjective, and obviously subject to considerable individual differences. But then if science *is* indeed public and sharable by all, then of course one cannot properly pursue it by starting from some bit of religious belief or dogma.

One root of this way of thinking about science is a consequence of the modern foundationalism stemming from Descartes and perhaps even more importantly, Locke. Modern classical foundationalism has come in for a lot of criticism lately, and I do not propose to add my voice to the howling mob.⁵ And since the classical foundationalism upon which methodological naturalism is based has run aground, I shall instead consider some more local, less grand and cosmic reasons for accepting methodological naturalism.

Methodological Naturalism Is True by Definition

So *why* must a scientist proceed in accordance with methodological naturalism? Michael Ruse suggests that methodological naturalism or at any rate part of it is *true by definition*:

Furthermore, even if Scientific Creationism were totally successful in making its case as science, it would not yield a *scientific* explanation of origins. Rather, at most, it could prove that science shows that there can be *no* scientific explanation of origins. The Creationists believe that the world started miraculously. But miracles lie outside of science, which by definition deals only with the natural, the repeatable, that which is governed by law.⁶

Ruse suggests that methodological naturalism is true by definition of the term science one supposes; Ruse apparently holds there is a correct definition of science, such that from the definition it follows that science deals only with what is natural, repeatable, and governed by law. (Note that this claim does not bear on the suggestions that a Christian scientist can propose hypotheses involving such religious doctrines as, say, original sin, and can evaluate the epistemic probability of a scientific hypothesis relative to background belief that includes Christian belief.) Ruse's claim apparently rules out hypotheses that include references to God: God is a supernatural being, hypotheses referring to him therefore deal with something besides the natural; hence such hypotheses cannot be part of science.

Three things are particularly puzzling about Ruse's claim. First, enormous energy has been expended, for at least several centuries, on the demarcation problem: the problem of giving necessary and sufficient conditions for distinguishing science from other human activities.⁷ This effort has apparently failed; but if in fact there *were* a definition of the sort Ruse is appealing to, then presumably there would be available a set of necessary and sufficient conditions for something as being science. Ruse does not address the many and (I think) successful arguments for the conclusion that there is no such set of necessary and sufficient conditions, let alone such a definition of the term science; he simply declares that - by definition - science has the properties he mentions.

Second, Ruse here proposes three properties that he says are by definition characteristic of any bit of science: that bit deals with things that (a) are repeatable, (b) are merely natural, and (c) are governed by natural law. But take repeatability, and consider this passage by Andrei Linde: speaking of the Big Bang, he says, One might think it very difficult to extract useful and reliable information from the unique experiment carried out about 10^{10} years ago.⁸ According to Linde, the Big Bang is unique and therefore, presumably, unrepeatable - at any rate it *might* turn out to be unrepeatable. If so, would we be obliged to conclude that contemporary cosmological inquiries into the nature of the Big Bang and into the early development of the universe are not really part of science?

Ruse suggests that methodological naturalism is true by definition of the term science one supposes; Ruse apparently holds there is a correct definition of science, such that from the definition it follows that science deals only with what is natural, repeatable, and governed by law.

Consider next the property of being governed by law. The first point, here, would be that the very existence of natural law is controversial; Bas van Fraassen, for example, has given an extended and formidable argument for the conclusion that there are no natural laws.⁹ There are *regularities*, of course, but a regularity

is not yet a law; a law is what is supposed to *explain and ground* a regularity. Furthermore, a law is supposed to hold with some kind of *necessity*, typically thought to be less stringent than broadly logical necessity, but necessity nonetheless.¹⁰ This idea of lawfulness, I think, is an inheritance of Enlightenment deism (see below, p. 148); and perhaps here as elsewhere Enlightenment deism misses the mark. Perhaps the demand for law cannot be met. Perhaps there are regularities, but no laws; perhaps there is nothing like the necessity allegedly attaching to laws. Perhaps the best way to think of these alleged laws is as universally or nearly universally quantified counterfactuals of divine freedom.¹¹ So suppose van Fraassen is right and there are no natural laws: would it follow by definition that there is not any science? That seems a bit strong. Further, it could be, for all we know, that there are some laws, but not everything is governed by them (or wholly governed by them). Perhaps this is how it is with earthquakes, the weather, and radioactive decay. Would it follow that one could not study these things scientifically?

The third puzzling thing about Ruse's claim: it is hard to see how anything like a reasonably serious dispute about what is and is not science could be settled just by appealing to a *definition*. One thinks this would work only if the original query were really a *verbal* question - a question like *Is the English word science properly applicable to a hypothesis that makes reference to God?* But that was not the question: the question is instead *Could a hypothesis that makes reference to God be part of science?* That question cannot be answered just by citing a definition.

Functional Integrity Requires Methodological Naturalism?

Diogenes Allen, John Stek, and Howard Van Till give answers of that sort. According to Van Till, God has created a world characterized by functional integrity:

By this term I mean to denote a created world that has no functional deficiencies, no gaps in its economy of the sort that would require God to act immediately, temporarily assuming the role of creature to perform functions within the economy of the created world that other creatures have not been equipped to perform.¹²

Note first that Van Till seems to be directing his fire at only one of the several ways in which Christians might employ what they know by faith in pursuing natural science; he is arguing that a scientific hypothesis cannot properly claim that God does something or other *immediately or directly*. (Note also that the claim here is not that such a hypothesis would not be *scientific*, but that it would be false.) What he says seems to be consistent, so far as I can tell, with the claim (say) that in doing their psychology Christian psychologists can properly appeal to the fact that human beings have been created in the image of God, or are subject to original sin.

So suppose we turn to Van Till's proscription of hypotheses to the effect that God has done something or other immediately or directly. This idea of direct action conceals pitfalls and deserves more by way of concentrated attention than I can give it here.¹³ The basic idea, however, is fairly clear. An example of *indirect* divine creation would be my building a house; we may say that *God* creates the house, but does so indirectly, by employing *my* activity as a means. So God acts indirectly if he brings about some effect by employing as a means the activity of something else he has created. God acts directly, then, if and only if he brings about some effect, and does not do so by way of employing as a means the activity of some created being.

[Van Till argues] that a scientific hypothesis cannot properly claim that God does something or other *immediately* or *directly*.

Now Van Till suggests that God does nothing at all in the world *directly*; only *creatures* do anything directly. But no doubt Van Till, like any other theist, would agree that God directly conserves the world and all its creatures in being; he is directly active in the Big Bang, but also in the sparrow's fall. Were he to suspend this constant conserving activity, the world would disappear like a dream upon awakening. And no doubt Van Till would also agree (on pain of infinite regress) that if God does anything in the world indirectly, he also does something directly: presumably he cannot cause an effect indirectly without also, at some point, acting directly, creating something directly. Van Till must therefore be understood in some other way. Perhaps his idea is that God created the universe at some time in the *past* (acting directly at that time) but since then he never acts directly in the world, except for conserving his creation in being, and miracles connected with salvation history. But why think a thing like that? Consider the fact that Christians as diverse as Pope Pius XII and John Calvin have thought that God created human souls directly; can we simply assume without argument that they are mistaken? What is the warrant for supposing that God no longer acts directly in the world?

Van Till appeals for support, for this theological position, to Allen and Stek; Allen asserts that

God can never properly be used in scientific accounts, which are formulated in terms of the relations between the members of the universe, because that would reduce God to the status of a creature. According to a Christian conception of God as creator of a universe that is rational through and through, there are no missing relations between the members of nature. If in our study of nature, we run into what seems to be an instance of a connection missing between members of nature, the Christian doctrine of creation implies that we should keep looking for one.¹⁴

Allen's suggestion seems to imply, not just that Christians cannot properly propose, as part of science, that God has done something directly, but also that it would be out of order to appeal, in science, to such ideas as that human beings have been created in God's image. For this idea is not a matter of saying how things in the world are related to each other; it is instead a matter of saying how some things in the world - we human beings - are related to God. Allen believes that scientific accounts must always be formulated in terms of the relationships between members of the created universe (and if that is true, then perhaps, as he says, referring to God in science would be to reduce him to a creature). Taken at face value, however, this seems hasty. A textbook on astronomy may tell you what the diameter of Jupiter is (or how old the earth, or the sun, or the Milky Way is). This does not tell you how things in the world stand related to each other, but instead just tells you something about one of those things; it is science nonetheless.

Allen's main point...is that a scientific account cannot properly be formulated in terms of the relationship of anything to God.

Allen's main point, of course, is that a scientific account cannot properly be formulated in terms of the relationship of anything to God. But why not? What is the authority for this claim? Does not it seem arbitrary? Consider the truth that human beings have been created in the image of God, but have also fallen

into sin. This dual truth might turn out to be very useful in giving psychological explanations of various phenomena. If it is, why should a Christian psychologist not employ it? Why would the result not be science? It could be that investigation would suggest that God created life directly; that it did not arise through the agency of other created things. If that is how things turn out, or how things appear at a given time, why not say so? And why not say so as part of science? As a Christian you believe, of course, that God made the world and could have done so in many different ways; why not employ this knowledge in evaluating the probability of various hypotheses (for example, the Grand Evolutionary Myth)? Christians also have beliefs about what is rational in Simon's sense - i.e., about what sorts of goals a properly functioning human being will have. Christians also have beliefs about what sorts of actions are in their own or someone else's best interests. Why not employ these beliefs in making a scientific evaluation of the probability of, say, Simon's account of altruism, or in giving her own account of these phenomena?

Finally, consider John Stek:

Since the created realm is replete with its own economy that is neither incomplete (God is not a component within it) nor defective, - Àunderstanding based on both practical experience and scientific endeavors - *we must methodologically exclude all notions of immediate divine causality*. As stewards of the creation, we must methodologically honor the principle that creation interprets creation; indeed, we must honor that principle as religiously as the theologian must honor the principle that "Scripture interprets Scripture" - or, since Scripture presupposes general revelation, that revelation interprets revelation. In pursuit of a stewardly understanding of the creation, we may not introduce a "God of the gaps," not even in the as-yet mysterious realm of subatomic particles. We may not do so (1) because God is not an internal component within the economy of the created realm, and (2) because to do so would be to presume to exercise power over God - the presumptuous folly of those in many cultures who have claimed to be specialists in the manipulation of divine powers (e.g., shamans in Russian folk religion and medicine men in primitive cultures).¹⁵

Stek insists that we must methodologically exclude all notions of immediate divine causality in our understanding of the economy of the created realm. One of his reasons seems to be that to appeal to a notion of immediate divine causality would be to introduce a God of the gaps, and to do *that* would be to presume to exercise power over God. But am I really presuming to exercise power over God by, for example, concurring with John Calvin and Pope Pius XII, and many others, that God directly creates human beings? Or in claiming that he created life specially? At best, this requires more argument.

As Stek says, God is not an internal component within the created realm. It hardly follows, however, that he does not act immediately or directly in the created realm; like any theist, Stek too would agree that God directly and immediately conserves his creation in existence. And would not he also agree that if God creates anything indirectly, then he creates some things directly? So I am not sure why Stek thinks that we must observe this methodological naturalism. Why think that God does not do anything directly or create anything directly? What is the reason for thinking this? Scripture does not suggest it; there do not seem to be arguments from any other source; why then accept it?

These reasons, then, for the necessity or advisability of methodological naturalism do not seem strong; and since they *are* so weak, it is perhaps reasonable to surmise that they do not really represent what is going on in the minds of those who offer them. I suggest that there is a different and unspoken reason for this obeisance to methodological naturalism: *fear and loathing of God-of-the-gaps theology*. As we saw above,

Stek declares that In pursuit of a stewardly understanding of the creation, we may not introduce a 'God of the gaps'; he, together with the other three authors I have cited in this connection (McMullin, Van Till and Allen), explicitly mention God-of-the-gaps theology and explicitly connect it with methodological naturalism via the suggestion that God has done this or that immediately. The idea seems to be that to hold that God acts directly in creation is to fall into, or anyway lean dangerously close to this sort of theology. But is this true? Precisely what *is* God-of-the-gaps theology?

Stek insists that "we must methodologically exclude all notions of immediate divine causality" in our understanding of the economy of the created realm.

There is not anything that it is *precisely*; it is not that sort of thing. Somewhat vaguely, however, it can be characterized as follows. The God-of-the-gaps theologian is an Enlightenment semideist who thinks of the universe as a vast machine working according to a set of necessary and inviolable natural laws. (Perhaps a God has created the universe: but if he did, it is now for the most part self-sufficient and self-contained.) These natural laws, furthermore, have a kind of august majesty; they are necessary in some strong sense; perhaps not even God, if there is such a person, could violate them; but even if he could, he almost certainly would not. (Hence the otherwise inexplicable worry about miracles characteristic of this sort of thought.) Natural science investigates and lays out the structure of this cosmic machine, in particular by trying to discover and lay bare those laws, and to explain the phenomena in terms of them. There seem to be *some* phenomena, however, that resist a naturalistic explanation - so far, at any rate. We should therefore postulate a deity in terms of whose actions we can explain these things that current science cannot. Newton's suggestion that God periodically adjusts the orbits of the planets is often cited as just such an example of God-of-the-gaps theology.

The following, therefore, are the essential points of God-of-the-gaps theology. First, the world is a vast machine that is almost entirely self-sufficient; divine activity in nature is limited to those phenomena for which there is no scientific, i.e., mechanical and naturalistic explanation. Second, the existence of God is a kind of large-scale hypothesis postulated to explain what cannot be explained otherwise, i.e., naturalistically.¹⁶ Third, there is the apologetic emphasis: the best or one of the best reasons for believing that there is such a person as God is the fact that there are phenomena that natural science cannot (so far) explain naturalistically.

I suggest that there is a different and unspoken reason for this obeisance to methodological naturalism: fear and loathing of God-of-the-gaps theology.

Now McMullin, Stek, Van Till, and Allen all object strenuously to God-of-the-gaps theology- and rightly so. This line of thought is at best a kind of anemic and watered-down semideism that inserts God's activity into the gaps in scientific knowledge; it is associated, furthermore, with a weak and pallid apologetics according to which perhaps the main source or motivation for belief in God is that there are some things science cannot presently explain. A far cry indeed from what the Scriptures teach! God-of-the-gaps theology is worlds apart from serious Christian theism. This is evident at (at least) the following points. First and most important, according to serious theism, God is constantly, immediately, intimately, and directly active in his creation: he

constantly upholds it in existence and providentially governs it. He is immediately and directly active in everything from the Big Bang to the sparrow's fall. Literally nothing happens without his upholding hand.¹⁷ Second, natural laws are not in any way independent of God, and are perhaps best thought of as regularities in the ways in which he treats the stuff he has made, or perhaps as counterfactuals of divine freedom. (Hence there is nothing in the least untoward in the thought that on some occasions God might do something in a way different from his usual way- e.g., raise someone from the dead or change water into wine.) Indeed, the whole *interventionist* terminology- speaking of God as *intervening* in nature, or *intruding* into it, or *interfering* with it, or *violating* natural law- all this goes with God-of-the-gaps theology, not with serious theism. According to the latter, God is already and always intimately acting in nature, which depends from moment to moment for its existence upon immediate divine activity; there is not and could not be any such thing as his intervening in nature.

These are broadly speaking metaphysical differences between Christian theism and God-of-the-gaps thought; but there are equally significant epistemological differences. First, the thought that there is such a person as God is not, according to Christian theism, a hypothesis postulated to *explain* something or other,¹⁸ nor is the main reason for believing that there is such a person as God the fact that there are phenomena that elude the best efforts of current science.¹⁹ Rather, our knowledge of God comes by way of *general* revelation, which involves something like Aquinas's general knowledge of God or Calvin's *sensus divinitatis*, and also, and more importantly, by way of God's *special* revelation, in the Scriptures and through the church, of his plan for dealing with our fall into sin.

According to [serious theism], God is already and always intimately acting in nature, which depends from moment to moment for its existence upon immediate divine activity; there is not and could not be any such thing as his intervening in nature.

God-of-the-gaps theology, therefore, is every bit as bad as McMullin, Van Till, Stek, and Allen think. (Indeed, it may be worse than Van Till and Stek think, since some of the things they think- in particular their ban on God's acting directly in nature- seem to me to display a decided list in the direction of such theology.) Serious Christians should indeed resolutely reject this way of thinking. The Christian community knows that God is constantly active in his creation, that natural laws, if there are any, are not independent of God, and that the existence of God is certainly not a hypothesis designed to explain what science cannot. Furthermore, the Christian community begins the scientific enterprise already believing in God; it does not (or at any rate need not) engage in it for apologetic reasons, either with respect to itself or with respect to non-Christians. But of course from these things it does not follow for an instant that the Christian scientific community should endorse methodological naturalism. The Christian community faces these questions: How shall we best understand this creation God has made, and in which he has placed us? What is the best way to proceed? What information can we or shall we use? Well, is it not clear initially, at any rate, that we should employ whatever is useful and enlightening, including what we know about God and his relationship to the world, and including what we know by way of special revelation? Could we not sensibly conclude, for example, that God created life, or human life, or something else specially? (I do not say we *should* conclude that: I say only that we *could*, and should if that is what the evidence most strongly suggests.) Should we not use our knowledge of sin and creation in psychology, sociology, and the human sciences in general? Should we not evaluate various scientific theories by way of a background body of belief that includes what we know about

God and what we know specifically as Christians? Should we not decide what needs explanation against that same background body of beliefs?

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Scriptures and through the church, of his plan for dealing with our fall into sin.**

Well, why not? That certainly seems initially to be the rational thing to do (one should make use of all that one knows in trying to come to an understanding of some phenomenon); and it is hard to see anything like strong reasons against it. We certainly do not fall into any of the unhappy ways of thinking characteristic of God-of-the-gaps theology just by doing one of these things. In doing these things, we do not thereby commit ourselves, for example, to the idea that God does almost nothing directly in nature, or that the universe is something like a vast machine in whose workings God could intervene only with some difficulty; nor are we thereby committed to the idea that one of our main reasons for belief in God is just that there are things science cannot explain, or that the idea of God is really something like a large-scale hypothesis postulated to explain those things. Not at all. Indeed, the whole God-of-the-gaps issue is nothing but a red herring in the present context.²⁰

Two Stronger Arguments for Methodological Naturalism

These arguments, therefore, are not very convincing; but there are two quite different, and I think, stronger arguments or lines of reasoning for embracing methodological naturalism in the practice of science. The first of these really deserves a paper all to itself; here, unfortunately, I shall have to give it relatively short shrift.

Duhemian Science

We can approach this argument by thinking about some striking passages in Pierre Duhem's *The Aim and Structure of Physical Theory*.²¹ Duhem was both a serious Catholic and a serious scientist; he was accused (as he thought) by Abel Rey of allowing his religious and metaphysical views as a Christian to enter his physics in an improper way.²² Duhem repudiated this suggestion, claiming that his Christianity did not enter his physics in an improper way, because it did not enter his physics in any way at all.²³ Furthermore, he thought the *correct* or *proper* way to pursue physical theory was the way in which he had in fact done it; physical theory should be completely independent of religious or metaphysical views or commitments.

He thought this for two reasons. First, he thought religion bore little relevance to physical theory: Was it not a glaring fact to us, as to any man of good sense, that the object and nature of physical theory are things foreign to religious doctrines and without any contact with them?²⁴

But there is something else, and something perhaps deeper. Although Duhem may have thought that *religious* doctrines had little to do with physical theory, he did not at all think the same thing about metaphysical doctrines. In fact he believed that *metaphysical* doctrines had often entered deeply into physical theory. Many theoretical physicists, as he saw it, took it that the principal aim of physics is to *explain* observable phenomena. Explanation is a slippery notion and a complex phenomenon; but here at any rate the relevant variety of explanation involves giving an account of the phenomena, the appearances, in terms of the nature

or constitution of the underlying material reality. He goes on to give a striking illustration, recounting how atomists, Aristotelians, Newtonians, and Cartesians differ in the explanations or accounts they give of the phenomena of magnetism: atomists give the requisite explanation, naturally enough, in terms of atoms; Cartesians in terms of pure extensions; and Aristotelians in terms of matter and form.²⁵ The differences among these explanations, he says, are metaphysical; they pertain to the ultimate nature or constitution of matter. But of course if the aim is to explain the phenomena in terms of the ultimate nature or constitution of matter, then it is crucially important to get the latter right, to get the right answer to the metaphysical question *What is the nature or constitution of matter?* In this way, he says, physical theory is subordinated to metaphysics: Therefore, if the aim of physical theories is to explain experimental laws, theoretical physics is not an autonomous science; it is subordinate to metaphysics.²⁶

Well, what is the matter with that? The problem, says Duhem, is that if you think of physics in this way, then your estimate of the worth of a physical theory will depend upon the metaphysics you adopt. Physical theory will be dependent upon metaphysics in such a way that someone who does not accept the metaphysics involved in a given physical theory cannot accept the physical theory either. And the problem with that is that the disagreements that run riot in metaphysics will ingress into physics, so that the latter cannot be an activity we can all work at together, regardless of our metaphysical views:

Now to make physical theories depend on metaphysics is surely not the way to let them enjoy the privilege of universal consent. If theoretical physics is subordinated to metaphysics, the divisions separating the diverse metaphysical systems will extend into the domain of physics. A physical theory reputed to be satisfactory by the sectarians of one metaphysical school will be rejected by the partisans of another school.²⁷

So here we have another argument for methodological naturalism, and a simple, commonsense one at that: it is important that we all- Christian, naturalist, creative antirealist, whatever- be able to work at physics and the other sciences together and cooperatively; therefore we should not employ in science views, commitments, and assumptions only some of us accept- that is, we should not employ them in a way that would make the bit of science in question unacceptable or less acceptable to someone who did not share the commitment or assumption in question.²⁸ But then we cannot employ, in that way, such ideas as that the world and things therein have been designed and created by God. Proper science, insofar as it is to be common to all of us, will have to eschew any dependence upon metaphysical and religious views held by only some of us; therefore we should endorse methodological naturalism. We do not, of course, have to be metaphysical naturalists in order to pursue Duhemian science; but if science is to be properly universal, it cannot employ assumptions or commitments that are not universally shared.

Duhemian science, therefore, is maximally inclusive; we can all do it together and agree on its results. But what about those who, like Simon, for example, think it is important also to do a sort of human science which starts, not from methodological naturalism, but from metaphysical naturalism? And what about those who, like the atomists, Cartesians, and Aristotelians think it is important to pursue a sort of science in which the aim is successful explanation in terms of underlying unobservable realities? And what about Christians or theists, who propose to investigate human reality employing all that they know, including what they know as Christians or theists? So far as Duhem's claims go, there is nothing improper about any of this. Should we call this kind of activity science; does it deserve that honorific term? There is no reason in Duhem for a negative answer. It is important, to be sure, to see that science of this sort is not *Duhemian* science and does not have the claim to universal assent enjoyed by the latter; but of course that is nothing against it.

[In Duhemian science, science] cannot employ assumptions or commitments that are not universally shared.

According to the fuller Duhemian picture, then, we would all work together on Duhemian science; but each of the groups involved- naturalists and theists, for example, but perhaps others as well- could then go on to incorporate Duhemian science into a fuller context that includes the metaphysical or religious principles specific to that group. Let us call this broader science Augustinian science. Of course the motivation for doing this will vary enormously from area to area. Physics and chemistry are overwhelmingly Duhemian²⁹ (of course the same might not be true for *philosophy* of physics); here perhaps Augustinian science would be for the most part otiose. The same goes for biological sciences: surely much that goes on there could be thought of as Duhemian science. On the other hand, there are also non-Duhemian elements in the neighborhood, such as those declarations of certainty and the claims that evolutionary biology shows that human and other forms of life must be seen as a result of chance (and hence cannot be thought of as designed). In the human sciences, however, vast stretches are clearly non-Duhemian; it is in these areas that Augustinian science would be most relevant and important.

So return to our central question: should the Christian scientific community observe the constraints of methodological naturalism? So far as this argument is concerned, the answer seems to be: yes, of course, in those areas where Duhemian science is possible and valuable. But nothing here suggests that the Christian scientific community should not also engage in non-Duhemian, Augustinian science where that is relevant. There is nothing here to suggest that if it ain't Duhemian, it ain't science.

Science Stoppers?

There is still another reason for methodological naturalism; this one, too, is common sense simplicity itself. God has created this whole wonderful and awful (both taken in their etymological senses) world of ours. One of the things we want to do as his creatures is to understand the world he has made, see (to the extent that we can) how it is made, what its structure is, and how it works. This is not, of course, the only thing God's children must do with the world; we must also appreciate it, care for it, love it, thank the Lord for it, and see his hand in it. But understanding it is valuable, and so is understanding it in a theoretical way. One way of understanding something is to see how it is made, how it is put together, and how it works. That is what goes on in natural science. The object of this science is nature; for Christians, its aim (one of its aims) is to see what the structure of this world is and how it works; this is a way of appreciating God's creation, and part of what it is to exercise the image of God in which we have been created.

But there will be little advance along this front if, in answer to the question, Why does so and so work the way it does? or What is the explanation of so and so? we regularly and often reply Because God did it that way or Because it pleased God that it should be like that. This will often be true,³⁰ but it is not the sort of answer we want at that juncture. It goes without saying that God has in one way or another brought it about that the universe displays the character it does; but what we want to know in science are the answers to questions like What is this made out of? What is its structure? How does it work? How is it connected with other parts of God's creation? Claims to the effect that God has done this or that (created life, or created human life) *directly* are in a sense science stoppers. If this claim is true, then presumably we cannot go on to learn something further about how it was done or how the phenomenon in question works; if God did it directly, there will be nothing further to find out. How does it happen that there is such a thing as light? Well, God said, Let there be light and there was light. This is of course true, and of enormous importance, but if

taken as science it is not helpful; it does not help us find out more about light, what its physical character is, how it is related to other things, and the like. Ascribing something to the direct action of God tends to cut off further inquiry.

Ascribing something to the direct action of God tends to cut off further inquiry.

Of course this is a reason for only *part* of methodological naturalism. There are several *different* ways in which Christianity might enter into the texture of science: (1) stating and employing hypotheses according to which God does things directly; (2) stating and employing hypotheses according to which he does something indirectly; (3) evaluating theories with respect to background information that includes Christian theism; (4) employing such propositions as *human beings have been created in God's image*, either directly or as background; (5) doing the same for such doctrines as that of original sin, which do not involve any direct mention of God at all; and (6) deciding what needs explanation by way of referring to that same background. The considerations cited in the last paragraph are at best a reason for a proscription of (1).

But they are not even much of a reason for that. The claim that God has directly created life, for example, may be a science stopper; it does not follow that God *did not* directly create life. Obviously we have no guarantee that God has done everything by way of employing secondary causes, or in such a way as to encourage further scientific inquiry, or for our convenience as scientists, or for the benefit of the National Science Foundation. Clearly we cannot sensibly insist in advance that whatever we are confronted with is to be explained in terms of something *else* God did; he must have done *some* things directly. It would be worth knowing, if possible, which things he *did* do directly; to know this would be an important part of a serious and profound knowledge of the universe. The fact that such claims are science stoppers means that as a general rule they will not be helpful; it does not mean that they are never true, and it does not mean that they can never be part of a proper scientific theory. (And of course it does not even bear on the other ways in which Christianity or Christian theism can be relevant to science.) It is a giant and unwarranted step from the recognition that claims of direct divine activity are science stoppers to the insistence that science must pretend that the created universe is just there, refusing to recognize that it is indeed *created*.

So there is little to be said for methodological naturalism. Taken at its best, it tells us only that Duhemian science must be metaphysically neutral and that claims of direct divine action will not ordinarily make for good science. And even in these two cases, what we have reason for is not a principled proscription but a general counsel that in some circumstances is quite clearly inapplicable. There is no reason to proscribe a question like: Did God create life specially?; there is no reason why such a question cannot be investigated empirically;³¹ and there is no reason to proscribe in advance an affirmative answer.

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Christian thought (particularly since the High Middle Ages) as opposed to Greek (and in particular

Aristotelian thought)³² contains a strong tendency to see the world as through and through *contingent*. The world need not have existed; that is, God need not have created it. The world need not have had just the structure it does have; that is, God could have created it differently. This sense of the contingency of nature has been one important source of the emphasis upon the **empirical** character of modern science. As a sort of rough rule of thumb, we can say that it is by *reason*, by a priori thought, that we learn of what cannot be otherwise; it is by the senses, by way of a posteriori inquiry that we learn about what is contingent.³³ But the world as God created it is full of contingencies. Therefore we do not merely think about it in our armchairs, trying to infer from first principles how many teeth there are in a horse's mouth; instead we take a look. The same should go for the question how God acts in the world: here we should rely less upon a priori theology and more upon empirical inquiry. We have no good grounds for insisting that God *must* do things one specific way; so far as we can see, he is free to do things in many different ways. So perhaps he did create human life specially; or perhaps he has done other things specially. We cannot properly rule this out in advance by way of appeal to speculative theology; we should look and see.

My main point, therefore, can be summarized as follows. According to Augustine, Kuyper, and many others, human history is dominated by a battle, a contest between the *Civitas Dei* and the City of Man. Part of the task of the Christian academic community is to discern the limits and lineaments of this contest, to see how it plays out in intellectual life generally, and to pursue the various areas of intellectual life as citizens of the *Civitas Dei*. This naturally suggests pursuing science using all that we know: what we know about God as well as what we know about his creation, and what we know by faith as well as what we know in other ways. That natural suggestion is proscribed by the Principle of Methodological Naturalism. Methodological naturalism, however, though widely accepted and indeed exalted, has little to be said for it; when examined coolly in the light of day, the arguments for it seem weak indeed. We should therefore reject it, taken in its full generality. Perhaps we should join others in Duhemian science; but we should also pursue our own Augustinian science.

By way of conclusion, I call attention to something else John Stek has said:

Theology must take account of all that humanity comes to know about the world, and science must equally take account of all that we come to know about God. In fact, we cannot, without denying our being and vocation as stewards, pursue theology without bringing to that study all that we know about the world, nor can we, without denying our being and vocation as stewards, pursue science without bringing to that study all that we know about God.³⁴

Just so.

Notes

¹For example, many Reformed Christians follow Abraham Kuyper in holding that intellectual endeavor in general and natural science in particular are not independent of religious commitment. Perhaps the credit for this idea should go not to Augustine, but to Tertullian. Tertullian has suffered from a bad press; one of his major emphases, however, is that scholarship- intellectual endeavor- is not religiously neutral.

²The idea is not, of course, that a scientist will not be passionate either about science generally, or his favorite theories, or his reputation; it is rather that none of these properly enters into the evaluation of a scientific theory or explanation.

³Science must be provisionally atheistic or cease to be itself. B. Willey, Darwin's Place in the History of Thought, in *Darwinism and the Study of Society*, edited by M. Banton (Chicago: Quadrangle Books, 1961), 1 - 16. Willey does not mean, of course, that one who proceeds in this way is properly accused of atheism. In the same way, to call this procedure or proscription methodological naturalism is not to imply that one who proceeds in this way is really a naturalist. See E. McMullin, Plantinga's Defense of Special Creation, *Christian Scholar's Review* 21 (September, 1991): 57.

⁴McMullin, Plantinga's Defence, 57.

⁵I have argued elsewhere that one condition of rationality laid down by modern classical foundationalism is in fact self-referentially incoherent. See, for example, A. Plantinga, Reason and Belief in God, in *Faith and Rationality*, edited by A. Plantinga and N. Wolterstorff (Notre Dame: University of Notre Dame Press, 1983), 60ff.

⁶Ruse, *Darwinism Defended* (Reading: Addison-Wesley, 1982), 322 (my italics).

⁷See, for example, L. Laudan, The Demise of the Demarcation Problem, in *But is it Science?* edited by M. Ruse (New York: Prometheus Books, 1988), 337-350.

⁸A.D. Linde, "Particle Physics and Inflationary Cosmology," *Physics Today* (September, 1987): 61.

⁹See B. van Fraassen, *Laws and Symmetry* (Oxford: Oxford University Press, 1989), chaps. 2 - 5.

¹⁰See, for example, D. Armstrong, *What is a Law of Nature?* (Cambridge: Cambridge University Press, 1983), 39ff.

¹¹That is, propositions that state how God (freely) treats the things he has made, and how he would have treated them had things been relevantly different. Nearly universally quantified: if we think of them this way, we can think of miracles as going contrary to law without thinking of them (inconsistently) as exceptions to some universal and necessary proposition.

¹²H.J. Van Till, When Faith and Reason Cooperate, *Christian Scholar's Review* 21 (September, 1991): 42.

¹³See, for example, W. P. Alston, Divine and Human Action, in *Divine and Human Action: Essays in the Metaphysics of Theism*, edited by T. Morris (Ithaca: Cornell University Press, 1988), 257-280.

¹⁴D. Allen, *Christian Belief in a Postmodern World* (Louisville: Westminster/John Knox Press, 1989), 45.

¹⁵J. H. Stek, What Says the Scriptures? in *Portraits of Creation: Biblical and Scientific Perspectives on the World's Formation*, edited by H. J. Van Till, R. E. Snow, J. H. Stek, and D. A. Young (Grand Rapids: William B. Eerdmans Publishing Company, 1990), 261.

¹⁶I do not mean to suggest that one who espouses or advocates God-of-the-gaps theology herself believes in God only as such a hypothesis: that is quite another question.

¹⁷In addition, most medieval Christian thinkers have also insisted on a separate divine activity of God's; any causal transaction in the world requires his *concurrence*. Problems arise here; to some ears it sounds as if this doctrine is motivated less by the relevant evidence than by a desire to pay metaphysical compliments to God.

¹⁸ See my "Is Theism Really a Miracle?" *Faith and Philosophy* 3 no. 2 (1986): 132ff

¹⁹A further problem with this way of thinking: as science explains more and more, the scope for God's activity is less and less; it is in danger of being squeezed out of the world altogether, thus making more and more tenuous one's reasons (on this way of thinking) for believing that there is such a person as God at all. (Of course it must also be acknowledged on the other side that things sometimes go in the opposite direction; for example, it is much harder now than it was in Darwin's day to see how it could be that life should arise just by way of the regularities recognized in physics and chemistry.)

²⁰Further, Newton seems to me to have suffered a bum rap. He suggested that God made periodic adjustments in the orbits of the planets: true enough. But he did not propose this as a reason for believing in God; it is rather that (of course) he already believed in God, and could not think of any other explanation for the movements of the planets. He turned out to be wrong; he could have been right, however, and in any event he was not endorsing any of the characteristic ideas of God-of-the-gaps thought.

²¹P. Duhem, (1906) *The Aim and Structure of Physical Theory*, translated by P. P. Wiener, with the foreword by Prince Louis de Broglie (Princeton: Princeton University Press, 1954).

²²A. Rey, *La Philosophie Scientifique de M. Duhem*, *Revue de Metaphysique et de Morale* 12 (July, 1904): 699ff.

²³See the appendix to *The Aim and Structure of Physical Theory*, which is entitled Physics of a Believer and is a reprint of Duhem's reply to Rey; it was originally published in the *Annales de Philosophie Chrtienne* 1 (October and November, 1905): 44f. and 133f.

²⁴Duhem, 278.

²⁵Duhem, 10 - 18.

²⁶Duhem, 10.

²⁷Duhem, 10.

²⁸This would not preclude, of course, employing such ideas in theories proposed, not as true, but only as empirically adequate.

²⁹The Principle of Indifference is non-Duhemian, but it is not easy to find other examples. (I am assuming that *interpretations* of quantum mechanics [as opposed to quantum mechanics itself] belong to philosophy rather than physics.)

³⁰Though not always: if the question is Why was there such a thing as WW II? the answer is not Because it

pleased God to do things that way. God of course *permitted* World War II to take place; but it was not pleasing to him.

³¹Why could a scientist not think as follows? God has created the world, and of course has created everything in it directly or indirectly. After a great deal of study, we cannot see how he created some phenomenon P (life, for example) indirectly; thus probably he has created it directly.

³²See Aristotle, *Posterior Analytics*, bk. I, 1 - 4, where Aristotle declares that *scientia* is a matter of seeing what necessarily follows from what one sees to be necessarily true. (Of course Aristotle's own practice is not always easy to square with this suggestion.)

³³Of course, this is at best a rough and general characterization: we can obviously learn of necessities a posteriori (for example, by using computers to prove complicated theorems) and perhaps also of contingencies a priori. This question of the connection between the a priori and the necessary, on the one hand, and the contingent and the a posteriori on the other (the question of the relationship between the a priori/a posteriori distinction and the necessary/ contingent distinction) is as deep as it is fascinating.

³⁴Stek, 260 - 1.
