

# Naturalism

Humanism is a naturalistic worldview. The British Humanist Association explains on its website that humanists believe, “that the universe is a natural phenomenon with no supernatural side.”<sup>1</sup>

Naturalism, then, excludes the supernatural. This much is clear, but when philosophers and scientists develop positive versions of naturalism, it divides into many varieties, from a minimal rejection of magic through to thoroughgoing scientific physicalism or materialism. Faced with this plurality, the way forward is to examine the root philosophical motivation for naturalism to see what it commits us to, and at what cost.

## What is naturalism and why does it matter?

Naturalism is the view that the sciences of nature are the best (in some versions, the only) guides to what there is, what it is like, and why. Naturalism is sometimes cast as the claim that there is nothing supernatural, nothing 'spooky' in the world. There are, for naturalists, no gods, fairies, Platonic forms or immaterial souls. However, this claim about what there is derives from the claim that the natural sciences are our best, perhaps our only sources of knowledge and explanation. To see that this is so, consider the list of things that naturalists regard as spooky and more especially the things that do *not* count as spooky. There are some very strange and, from a human perspective, elusive things in the world, such as sub-atomic particles and radio waves, but these are not spooky because physics can detect them, model them mathematically and to some degree explain their properties. If we had telepathic powers, they would be spooky only if they operated in a way that left no trace detectable by natural science. Mobile telephony is not spooky. Imagine creatures that had evolved radio receivers and transmitters as parts of their bodies. They would be telepathic, but this would not be spooky. The natural sciences have the cultural authority to rule on what is or is not spooky just because they enjoy such striking success, compared with other discourses, in supplying knowledge and explanations and resolving their internal disputes. Broadly speaking, naturalist epistemology (theory of knowledge) is logically prior to naturalist ontology (account of what there is).

Naturalism exists as an –ism, as a philosophical thesis, because it lives as a tendency, a stance, a cast of mind, a constellation of mental habits and reflexes. This life feeds on the spectacular successes of the natural sciences. No other intellectual enterprise except pure mathematics has such reliable and effective means for correcting error and achieving stable results. Moreover, through the technologies that it enables, natural science shapes the life of everyone on Earth. This gives natural scientists an authority beyond the borders of their disciplines. In public controversy, the principal opposition to organised religion seems to come from natural science. This is not because other disciplines are irrelevant or lack arguments. For example, there is an aesthetic case against the established monotheisms. As bodies of practice that promise to turn the highly contingent joys and inevitable sorrows of finite creatures into tales worth telling, the Mosaic monotheisms can be found wanting compared to art and literature. The religious traditions have insight and inspiration to offer, but shackled as they are with doctrine and limited to a fixed canon of Holy Scripture, they will always lack depth and subtlety compared with the traditions of practice that produced Sophocles and Shakespeare, Goya and Beethoven, and the rest of the best of art and literature. Suspend, for a moment, the question of whether an anti-theistic argument of this sort could succeed. The point to note is that it is rarely even explored, in spite of the fact that it reaches the heart of the matter. Making sense of human life is the principal business of organised religion, including those varieties of religion that take care to avoid conflict with natural science by not saying anything testable about the natural world. One might have expected opponents of organised religion to seek out arguments

to show that it is not very good at its main business. Critics of organised religion rarely deploy arguments rooted in literary or art criticism, because aesthetics does not have sufficient cultural credibility to carry conviction among the undecided. This is because aestheticians produce shifting, conflicting semi-subjective readings of artworks rather than stable, agreed knowledge.

To consider another alternative, there is an ethical case against organised religion. Many atheists feel that, far from supplying reasons for behaving decently and a practical specification of what decency means, orthodox religions fail to meet our ethical standards. Ancient religious texts encourage attitudes that we now find prejudiced, and for the most part fail to condemn slavery. Even those versions of monotheism that have had these unattractive features reformed out of them usually retain an insistence on the importance of gratitude and obedience towards God, regardless of what God chooses to visit upon us. This looks, to many humanists, like a failure to appreciate the ethical importance of the dignity and autonomy of individual persons. Uncritical, indiscriminating gratitude and obedience seem, from a humanist point of view, like servility. Besides, to act well for the sake of God is to miss the point of ethics, and to misdirect our attention away from the proper objects of ethical concern. When I treat someone well, my principal reason for doing so should be something to do with that person—her needs, rights, sensibility or interests, depending on the case. I may also have a regard for my own integrity and the good of society. These are all proper objects of my ethical concern, from which thoughts of God can only be a distraction. This, in outline, is an objection to organised religion that (like the aesthetic objection) cuts close to the core of what religion and humanism are both about. Compared with such considerations, the points of dispute between some natural sciences and some versions of theism are about as relevant to most people's lives as the controversies among physicists over string theory. Indeed, the ethical shortcomings of the established monotheisms are often a motive for becoming a campaigning humanist. However, we live in a culture that is unsure of the status and sources of ethics, so this line of argument too seems insufficiently robust for the task of refuting religion in public.

Historical criticism is another road rarely travelled by campaigning humanists. The Abrahamic religions all make claims about the past, if only about the origins of their scriptures and the lives of their founders. Historians, though they dispute explanations and interpretations, have reliable means of establishing some facts about some events in the past. One might think that here is a solid basis for anti-theistic argument. Indeed, the development in the nineteenth century of rigorous critical history was vital to the emergence of the contemporary secular spirit. However, historical argument has features that make it unsuitable for public controversy. In order to understand a historical event, one has to reconstruct in thought the significantly related features of the world in which it took place. Crossing a river may mean nothing—or the river may be the Rubicon and the traveller a Roman military commander, in which case this act may have a very specific significance. Laying out the background against which an act becomes intelligible tends to be a wordy business. Historical theses are responsible to masses of available evidence, in ways that depend on judgments about what is significantly related to the events in question and how. Debates about historical theses involve contesting such matters of detail and rarely issue in a clear winner. Moreover, the origins of religions, the lives of their founders and the composition histories of their texts tend to be obscure. It is rarely possible to find independent testimony sufficient to establish beyond dispute that this miracle did not happen or that those events did not take place as described. Usually, historical criticism has to be satisfied with indirect arguments such as appeals to: the presence in an allegedly new, original faith of elements from previous religious cultures; the historical specificity of supposedly universal religions; or the failure of independent contemporary chronicles to mention publicly performed miracles. Such arguments are often sound, but they do not offer killer debating points to public polemicists. In general, historical argument requires too much patience and attention to detail for campaigning purposes. Invited to endorse a simple claim, historians usually

say, “It’s actually more complicated than that...” This is not helpful for campaigning humanists. Finally, historians differ in their interpretations of the available evidence in ways that natural scientists do not. More precisely, historians go on disagreeing indefinitely, whereas disputes in natural science usually reach a conclusion. Historians do not have reliable means for resolving their larger disagreements and hence find themselves unfairly tossed into the same box as art critics and ethicists—the box labelled ‘it’s all a matter of opinion’.

Thus, in spite of the fact that there are promising aesthetic, ethical and historical arguments that strike against the core narratives and claims of the main organised religions, public opinion regards natural science as the effective opposition to organised religion. Natural science alone has the authority to offer an account of reality so powerful and comprehensive that it may leave no room for alternatives—or at least, it sets conditions on what alternatives there may be.<sup>2</sup> Naturalism is the name this conviction takes when it crystallises as doctrine. As Wilfred Sellars put it, “Science is the measure of all things, of what is that it is, and of what is not that it is not.”<sup>3</sup>

## Is Naturalism true?

We have seen that naturalism has two aspects: it makes claims about what there is (or rather, what there is not: it says that there is nothing ‘spooky’) and it makes claims about knowledge and explanation. Here I shall consider the ontological aspect (the part about what there is not) first, so that we can see what is at stake when we come to the second, epistemological aspect.

### Naturalist Ontology

Many things are invisible to natural science. Money, for example, is real. A person’s level of wealth or indebtedness is a matter of fact no less than his or her weight. Natural science can detect physical tokens and the electronic recordings in banks’ computers, but it cannot recognise these as money. This is particularly obvious in the case of obsolete currencies. On 1 January 2002, my small pile of French francs and centimes ceased to be money, but there was no physical alteration in these tokens, nor was there any event that natural science could identify as the cause of my old French coins ceasing to be money, because the relevant concepts are social and political, not natural. Naturalist inclinations might tempt us to say that money is *merely* social or political, but this is a temptation we should resist. Anyone who seriously doubts the reality of money should try telling creditors that money is merely a social construction.

Music is another reality that escapes natural scientific scrutiny. Physics can detect sound waves, and neurologists can study the effect of music on brains, but there is no way for natural science to distinguish between music and other kinds of sound. In some avant garde contexts, the sound of a helicopter can be music, and many musical performances include silences. We need not consider the extreme case of a performance that consists entirely of silence—any piece of music that includes a rest between one phrase and another will make the point. If the music of which a rest is a part is in common time and C-major, then it is not absurd to say that the silent rest is in the same rhythm and key. Natural science has no hope of distinguishing a musical silence from a non-musical one, because ‘music’ is a cultural category, not a natural one.

Still, one might say, money and music are not spooky. They exist in space and time. For money to exist, there must be physical tokens (coins, electronic records or perhaps, in an alien species incapable of forgetfulness or deceit, brain-states), there must be some society of physically embodied people who use these tokens as money, and there must be physically-mediated communication among these people. We make music by beating, scraping or blowing—all physical actions. The relevant philosophical technical concept here is *supervenience*. One domain (say,

money) *supervenes on* another (say, physics) if, for every change that takes place in the first, there is a corresponding change in the second. If I pay a restaurant bill (which is an alteration in the domain of money), there is a corresponding physical change—it could be a movement of notes and coin from my pocket to the cash-register, or it could be alterations to the electronic records of the relevant banks. Any change in the world of money has a corresponding change in the world of physical nature—or to use the technical term, money supervenes on physical nature. Philosophers put it this way in order to avoid suggesting that there is some regular pattern between these two domains. Given a purely financial description of a financial event—say, that I paid my restaurant bill—you could not identify the molecules that participated in the corresponding physical event (though you could guess that molecules in my brain probably did play a role, and confidently identify some that were not involved, such as the molecules in distant stars). Physical nature does not supervene on money, because there can be physical changes without corresponding financial changes. Notice that the supervenience relation between the corresponding physical and financial events is not like the causal relation between temporally discrete events. Suppose that two astronomers have a bet on the date of an expected supernova. Shortly after they observe the supernova, one astronomer passes a banknote to the other. The supernova causes a financial transaction, but the financial event does not supervene on it (rather it supervenes on the movement of the banknote). One way of thinking about the supervenience relation is to say that the financial event (paying a bill) and the corresponding physical event (changes in electronic potential in bank's computers) are the same event, but differently described. Not all philosophers accept this.

Similarly, music supervenes on physical nature. For every musical event, there is a corresponding physical event. This normally includes a propagation of sound waves, but it could be the brain activity of a musician silently reading a score, or that of a composer who inwardly hears the solution to a musical riddle. Thus, although music and money are invisible to natural science, they depend on (supervene on) things that the natural sciences can detect. This dependency suggests that the objects of natural science are somehow more basic or more real than music and money. I shall return to this in a moment. First, here are some other examples of things that escape detection by the natural sciences.

Arguments are essential to the practice of science. We are obliged to believe the conclusion of a scientific enquiry only insofar as there is a good-quality argument that takes us from the data that the argument relies on to the conclusion of the enquiry. The standard account in philosophy of logic is that a good-quality argument is one with the right kind of logical relations between the propositions that make up its premises and the proposition that is its conclusion. An argument is a relation between propositions. It helps at this point to appreciate some standard distinctions between propositions, sentences and statements. A statement is a datable event at a specific location—as in, “the lawyer made a statement on the steps of the court at 3.30 today.” Sentences differ from statements in that they are not spatially and temporally specific. British prime ministers reply to some questions in Parliament with the sentence, “I refer the honourable gentleman to the statement I made some moments ago.”— it is always the very same sentence, even though the PM says it many times. So a sentence is more abstract than a statement. However, a sentence is a specific chain of words. A proposition is not. One could express the same proposition by different sentences in the same language (‘Paul is taller than John’ and ‘John is shorter than Paul’ express the same proposition) or by sentences in different languages. Propositions are thus more abstract than sentences and not easily detectable (as such) by natural science. But remember, we are interested in arguments. An argument consists of logically related propositions. So if we want to detect arguments, we have to detect not only propositions but also the logical relations between them. Natural science cannot do this directly. In order for natural science to detect logical relations even

indirectly, we would have to discover a law-like connection between logical relations and something that natural science can detect. There are no plausible candidates for this 'something'.

This matters because natural science is a great collection of arguments. So although arguments, and the distinction of quality between the ones we ought to believe and the others, are invisible to natural science, they are an inescapable part of the world of anyone who practices natural science. Therefore, they are an inescapable part of the world of anyone who wishes to take natural science as the measure of all things, of what is that it is, and of what is not that it is not. Of course, *making* arguments involves objects and processes that natural science *can* detect (ink on paper, sound-waves, changes in electronic records, etc.). Argument-making supervenes on physics in something like the way that music does. But it does not follow from this that arguments themselves supervene on physics. It is not uncommon for the same argument to turn up independently in different times and places, because people living in societies separated in space and time nevertheless inhabit the same planet and belong to the same species, and consequently face many of the same problems and questions. Suppose that some priest X thought of *an* argument in Persia in 600BC, but *that argument* was later forgotten and all records of it destroyed. Now suppose that Celtic monk Y *rediscovered it* in 600AD. It seems that to speak of a *rediscovery*, we have to accord this argument a kind of existence that is independent of any physical expression or record. In other words, arguments are spooky. Either that, or we have to find an interpretation of the grammar of sentences about the rediscovery of arguments that shows how they are not (in spite of appearances) talking about a single item, the argument, which was found, then lost, then found again as if it were a physical object. This is not impossible, but such a re-reading of ordinary English grammar would have to have some independent motivation, aside from satisfying the naturalist inclinations of the re-reader. In any case, arguments are not the only abstract objects that science seems to need.

What are naturalists to say about mathematics? One tempting line is to say that when mathematicians seem to talk about mathematical objects, they are really talking indirectly about spatial-temporal objects. On this view, theorems about numbers are really facts about collections of things, and theorems in geometry are really facts about physical space, or perhaps space-time, or perhaps a model of space-time. The trouble with this line is that much of pure mathematics is about objects that have no spatial-temporal correlates. For example, in solid geometry, there are just five regular polyhedra (the tetrahedron, octahedron, cube, dodecahedron and icosahedron—the 'Platonic' solids). Perhaps we could think of this result as a fact about physical space (or a certain useful model of it). However, we can ask the same question (how many regular shapes?) about spaces with more than three dimensions. There are objects like regular polyhedra in higher dimensions (they are called 'convex regular polytopes'). In the case of four dimensions, there are precisely six convex regular polytopes. In all dimensions higher than four, there are just three convex regular polytopes. This result is not about physical space or spatial-temporal objects. There is nothing physical or spatial-temporal that these theorems are 'really' about. Convex regular polytopes in higher dimensions do not supervene on anything physical (they do not change, so the definition of supervenience does not apply to them). There is no prospect of translating facts about them into facts about things that natural science can detect. They leave no physical trace. They seem spooky. Nevertheless, natural science depends on some highly abstract mathematics.

For all this, one may feel that the objects studied by the natural sciences are *really* real in a way that these other things are not. After all, as we noted, many of the items that are undetectable by natural science nevertheless supervene on objects and processes that natural science can detect. So what does 'real' mean? How can we judge which objects are *really* real? There are some reality-tests we can apply to things that we suspect may or may not be real. One is resistance to my will: something is real if I cannot change it just by wishing—fantasies fail this test, but money, music,

arguments and mathematical objects all pass it. Certainly, I can change the first two if I work on them, but this is also true of physical objects. On this test, abstract objects are more real than physical objects. Another reality-test is independence of my consciousness—dreams fail this. But our four non-natural objects do quite well on this test. For example, our financial condition does not change when we fall asleep. A third reality-test is that a real object should have more than one mode of presentation (for example, some philosophers<sup>4</sup> have argued that the shape of a physical object is an objective feature because you can feel it and see it, touch and sight being two modes of presentation). This is true of some of the most important mathematical constants—you can think of  $\pi$  as the ratio of the circumference of a circle to its diameter, or you can define it in terms of power series that seem to have nothing to do with circles. There are many ways of calculating a person's wealth, and you can hear music, feel it through the floor, or read it from a score.

There is another class of items, rather less abstract than the objects of pure mathematics, which also seem to fall outside the scope of the natural sciences. These are our empirical perceptions, our experiences of colour, sound, balance, movement and so on. These do seem to supervene on physical events (for every change in perception, there must be a change in the perceiver's brain). However, perceptions are problematic for naturalism because their spatial locations are hard to pin down. Is the redness of a red ball in the ball or in the eye of the beholder? Is the pain of my sore toe in my toe or in my brain? This question about location is pressing so long as we insist, on naturalist grounds, that everything must have a spatial-temporal location. But we know that this is not true of some things. Suppose the bank takes my savings, combines them with the savings of other depositors and lends this aggregate to several different borrowers. Where is my money? It is not in the bank, because the bank loaned it to someone else. But because the bank aggregated my money with that of other savers, we cannot track it to this or that borrower. My money is in no place. Nevertheless, in spite of being nowhere, my money exists, and there is nothing spooky about it. Perhaps perceptions, numbers and arguments are also nowhere.

Professional naturalist philosophers do not stand helpless before these considerations. There are long-running philosophical research-programmes aimed at making all these objects and phenomena safe for naturalism. Naturalist philosophers of mind can offer reasons to hope that neurology will one day explain everything about our perceptual experience. Naturalist philosophers of mathematics have a range of options: they can insist that mathematics is a collection of conditional truths (*if* there were things of this sort *then* they would necessarily have these properties), or they can argue that mathematics does not really have objects, or that the objects of mathematics are useful fictions (other options are available too). Naturalist philosophers of logic and language have elaborated interpretations of the central logical terms like 'proposition', 'argument' and 'valid' that make no reference to abstracta. Naturalist philosophers can insist that music and money are complex systems of meanings, conventions and intentions, and that these are all ultimately states of the brains of the people who participate in these institutions, and would be captured and explained by a comprehensive knowledge of those brain-states, were such knowledge possible.

This is not the moment to evaluate these efforts, but merely to note that they are *strenuous*. Showing that mathematics can do without mathematical objects, for example, requires an enormous technical labour. Naturalists face an especially difficult task with normativity (the question of what we ought to do). I said earlier that we *ought* to be convinced by good arguments, and that we cannot understand the practice of science without recognising this. Where in the-world-as-described-by-natural-science is that 'ought' to be found? The leading naturalist reply is to make this ought into a conditional imperative.<sup>5</sup> It says: *if* you are trying to understand the natural world, *then* the most efficient strategy is to do it like this. However, this reply seems insufficient. If someone shows me a good argument, I ought to find it rationally compelling, regardless of my aims. In the

philosophy of mind, defending naturalism entails claiming that if we knew all the natural facts, we would know everything. For example, a naturalist might claim that if we knew all the natural facts about all the brains of all the musicians in the world (and any other relevant natural facts, for example about sound and the instruments we use to make it), then we would know everything about music. The antecedent of this if-then statement can never be true; we can never know all the natural facts about all the brains of all the musicians in the world. For reasons of this sort, naturalist philosophy of mind depends on thought- experiments that are often counter-intuitive and difficult to think about. Arguing for naturalism is strenuous—it strains the philosophical imagination and it is not outrageous to suggest that at times it strains credibility. All I want to claim here is that naturalism as a claim about what there is in the world is not an obvious, unproblematic truth that only a person corrupted by superstition or religion could dispute. On the contrary, naturalism is far from obvious and full of unsolved problems, in spite of the best efforts of thousands of professional philosophers.

So far, in this section, I have discussed naturalism as a claim about what there is. However, as I suggested at the outset, naturalist ontology gains its credibility from the epistemological and explanatory successes of natural science. This point is, I hope, more obvious now that we have sketched the extensive and arduous tasks that lie before philosophers who wish to insist on naturalist ontology. The professional philosophers who undertake the job of vindicating naturalist ontology find their motivation in the epistemological and explanatory successes of the natural sciences. The worldview that naturalist philosophers draw from the natural sciences may face all sorts of difficulties and objections, but, the naturalists think, something like it *must* be true because the natural sciences enjoy such prodigious success and enable the manufacture of such extraordinary technologies. This tension is one of the central drivers of contemporary philosophy. On one hand, the successes of natural science suggest that some version of naturalism must be true. On the other hand, reconciling naturalism with everything else that we know is very difficult. It is time to examine the other aspect of naturalism, that is, its epistemology.

### **Naturalist Epistemology**

No-one seriously disputes that the natural sciences are successful in finding knowledge of and explanations for natural phenomena. But are the natural sciences the *only* sources of knowledge and explanation worthy of the name? One of the most serious challenges to this view comes from the discipline of history. (In fact, I think it is *the* most serious challenge, for reasons explained below.) Historians do seem to gain knowledge, understanding and explanations of events in the past by thinking rigorously about the evidence available to them now, in the present. A naturalist who thinks that natural scientific knowledge is the only sort of knowledge available must say that insofar as historians do know and explain, they do so using some version of the methods of the natural sciences, and that the explanations they offer work the same way as explanations in natural science. This claim takes some arguing because it requires us to (1) understand the underlying logic (in the broad, methodological sense of 'logic') of explanations in the natural sciences, (2) understand the underlying logic of explanations in history, and (3) compare them to show that they are, at bottom, the same. This is a tall order. Task (1) assumes that all the natural sciences have the same underlying logic<sup>6</sup>, and task (2) assumes that all historical explanations have the same underlying logic. This is not obvious, because not all natural scientists work the same way, and not all historians work the same way. However, setting these variations within the two camps aside for a moment, there do seem to be some deep differences between the way the natural scientists and historians pursue their investigations.

One difference is that historians understand events by setting them in historical context. For example, Martin Luther nailed his convictions to the Wittenburg church door. Our understanding of this deed shifts when we learn that this was the normal way of publishing academic theses in advance of a public debate, and deepens a little further on learning that the church in question housed a large and profitable collection of holy relics. Deeper understanding still would come from further contextualisation. In the natural sciences, it is not usually necessary to contextualise events in order to understand them (though it may be necessary to say something about the environment in which they take place—for example, the temperature). The difference between environment and context is that environmental factors such as temperature can only make a difference causally. Context does not work this way. Perhaps the relics in the Wittenburg church made no causal difference to Luther's nailing up of his theses, but they change the nature of his act nevertheless. When two particles collide, physicists can understand the collision without needing to know when and where they collided, whether this collision was planned or accidental, or whether the particles have collided previously. When two people meet, the nature (and in some cases, the legality) of the meeting may depend on whether it was a chance encounter or a rendezvous, and whether this was the first time they had met. The place and time of the meeting may be important. There is a photograph taken in 2007 of the northern Irish politicians Ian Paisley and Martin McGuinness sharing a joke in public. It is possible that they had laughed long and hard together in private before then, but if they did, their private laughter had none of the significance of that one public moment of mirth. The distinction between private and public contexts does not apply to particles.

Another difference is that the objects of historical enquiry, that is, human beings, have memories and purposes. In order to understand what people did, we have to consider what it was they were trying to do, and the experiences and beliefs that informed these efforts. This is obvious in the sort of narrative history that considers the actions of individuals. But human purposes play a role even in the sort of long-duration history that looks for structural explanations for the rise and fall of entire societies over centuries. Histories of this sort may not consider the beliefs and motives of individuals but they must invoke shared ideologies, group memories and collective purposes.

A third difference, that the first two go some way toward explaining, is that, as Galileo put it, the book of nature is written in the language of mathematics.<sup>7</sup> Measurement and mathematical modelling do play roles in history, but they are not the exclusive language of history as they are in most of the natural sciences. One might, for example, use a mathematical model to show that a particular society was in economic decline, but one could not understand what was happening without knowing something about the religious outlook and ideological orientation of the society. There are many different ways of responding to an economic decline—denial, change of economic policy, invasion of neighbouring territories, intensification of religious devotions and so on. A society that believes that misfortune is invariably a divine punishment may respond differently from a society that associates wealth with military valour, and economic models do not capture such differences. When the price of bread rises, people may respond with textbook economic behaviour such as switching to potatoes or importing more grain—or they may riot. What they do will depend in part on their beliefs about themselves and the world they live in, for example, they may have an understanding of kingship that makes some courses of action impossible. The prospect of developing a general formal model of political authority that would be of any use at all in explaining specific events is remote. (To get a sense of how deeply ideological and religious convictions can structure behaviour, consider the pharaohs of ancient Egypt. For centuries, they worked very hard to protect their mummified corpses from thieves and developed all manner of ingenious strategies, but, for ideological and religious reasons, they never considered the simple option of not being buried with an immense hoard of treasure.) Contexts, purposes and memories are specific to times,



places and people. In the natural sciences, in contrast, general mathematical models are powerful precisely because they abstract from particular details.

It is plausible that these differences mark the study of human history as a different sort of enquiry from the natural sciences, with radically different, methods and modes of argument because they have radically subject-matter. To make this vivid, consider the very different course that disagreements take in history from the way that natural scientists attempt to resolve controversies. If this is right, then the natural sciences are not the only sources of knowledge and explanations worthy of the name. In other words, if historical knowledge and explanation is not a branch of natural science, then naturalism is false. This point is especially sharp, because naturalists find themselves obliged to make historical arguments. To see why that is, it is worth considering the mildest form of naturalism: methodological naturalism.

Methodological naturalism is the approach to the study of nature that treats the world *as if* it had nothing in it but spatial-temporal objects and their natural properties and *as if* all causes were natural causes. It is the minimal requirement for natural scientists. When natural scientists seek the cause of an event, they have to look for natural causes, even if there does not seem to be one or if a non-natural explanation makes more sense. If someone recovers from a disease for no obvious reason, scientists cannot declare a miracle (even if they personally believe in miracles). Methodological naturalism requires them to say that the patient recovered as a result of some unknown natural process. If a person chooses an apple rather than a cake, non-scientists might be satisfied with the explanation that this person has the *aim* of losing some weight, and natural scientists might be satisfied with this too, outside their scientific work. But a natural scientific explanation of this decision must cite only natural causes, such as brain chemistry and evolutionary pressures (aims are not natural causes). The great advantage of methodological naturalism is that it leaves open the question of whether full-strength, unconditional naturalism is true. It allows most varieties of atheist and religious believer to work together as scientists. As long as everyone in the laboratory is intent on seeking natural explanations for phenomena, it may not matter that they disagree about whether these are the only kind of explanation possible. They can agree that *from the point of view of natural science* there are no non-natural objects, processes or properties. They need not, for day-to-day scientific purposes, broach the question of whether the point of view of natural science is the only properly objective or informative perspective.

Full-strength naturalists, of course, are not satisfied with merely methodological (as-if) naturalism. They insist that the sciences that proceed on naturalist assumptions are successful because those assumptions are true. When pressed, however, they run the risk of arguing in a circle. If the natural sciences assume methodological naturalism as a premise, it is hardly surprising or impressive when they conclude that the world has nothing but natural objects, properties and causes in it. The dramatic successes of the natural sciences and the technologies they enable do suggest very strongly that the natural world is much as the natural sciences describe it, but this does not establish naturalism. Non-naturalists who think that there are other aspects to reality aside from those revealed by the natural sciences need not (and ought not) deny that the natural sciences get nature right. It is quite possible to recognise the successes of the natural sciences while insisting that there are non-natural domains, which might include culture, the economy, ethics, mathematics, logic, spirituality or religion. On this sort of view, the discourse that explains how sound waves propagate is simply disjoint from the discourse that seeks to understand what it is about the music of WA Mozart that makes it on the whole better than the music that his father wrote. Theists (other than scriptural literalists) can agree that the natural world operates according to laws that we can formulate mathematically and discover experimentally, and add that, from a religious point of view, it is suffused with love and mercy. Platonists can agree with the results of natural science and add

that only their commitment to really existing abstracta can explain how such sciences are possible. And so on. Methodological naturalism is compatible with all manner of non-naturalist metaphysics. Therefore, full-strength, unconditional naturalists have to make an argument.

There is an argument available to full-strength naturalists that tells against the major religious non-naturalist worldviews. It is this: these worldviews have been tried and found wanting. Methodological naturalism did not spring from nowhere. It is the product of a centuries-long process that began in societies that saw the world (including the aspects of the world that we now think of as nature) in religious terms. The shift away from the mental habit of understanding natural phenomena in terms of divine purpose did not happen quickly, nor was it the result of a single innovation. The earliest Greek philosopher that we know of, Thales of Miletus, is said to have claimed that “Everything is full of gods”—that is, change and movement in nature are explained as the activity of myriad purposeful agents. In this, Thales seems to have intellectualised the popular religion of his day. Even a phlegmatic and worldly thinker such as Aristotle thought that everything has a *telos*, that is, a purpose or direction. Spin forward to the end of the thirteenth century. When the Dominican monk Theodoric of Freiburg wrote on the nature of rainbows, he combined the biblical account (that the rainbow is a sign of God’s covenant with man) with geometrical analyses of the incidence of sunlight on raindrops. (Theodoric seems to have been an early experimentalist, using glass globes to model raindrops.) As the centuries advanced and the physico-mathematical explanations became more sophisticated, the role of divine purpose receded and became vague. Leibniz was sure that everything happens as part of the divine plan, but saw no point in trying to associate particular natural phenomena with particular divine purposes. The last flicker of animism in natural science was vitalism (the view that living matter contains some non-physical vital spark or is somehow essentially different from non-living matter), and this finally died out in the early years of the twentieth century.

There are many different versions of the story of the emergence of natural science from natural philosophy, magic, speculation and myth.<sup>8</sup> The central point is this: it is a story of progress. Naturalists can point out that religious views of the natural world have fallen out of favour because they lost a fair contest. In other words, naturalism may be among the methodological assumptions of any individual piece of *current* work in natural science. However, it is also the *conclusion* of a historical argument that does not assume naturalism. On the contrary, the history of science starts from radically non-naturalist beginnings, and reveals naturalism to be the *outcome* of the best efforts of serious-minded people to understand the world. Many of the great scientists of the past were religious, but this shows that the historical contest was a fair test (or if it was unfair, the bias was against naturalism, which won anyway).

The price that naturalists pay for this argument is that they have to recognise historical explanation as explanation worthy of the name. We can understand the process that drove divine (spooky) purposes out of our understanding of nature only by reconstructing and contextualising the aims and arguments of generations of scientists. The hard and pure naturalism that insists that natural science offers the only genuine explanations, and that historical explanations are not real explanations, cannot win this argument. The most it can do is to offer a promissory note to the effect that on some unspecified future date it will successfully rewrite historical explanations as natural scientific explanations. There is no reason why anyone should take such a bill, underwritten as it is by little more than the philosophical intuitions of convinced naturalists. It is also worth noting that the argument from the history of science works only against the (specifically religious) forms of non-naturalism that lost their historical contest with natural science. It may leave other non-naturalisms untouched.

In short, the serious opposition to full-strength naturalism does not come from religion. Religious non-naturalists insist that there is a dimension of divinity in addition to the aspects of the world that natural science explores, but they struggle to show it to anyone who does not already see it. Philosophical non-naturalists have good grounds for doubting that naturalists can deliver on their promises but struggle to offer persuasive arguments for their own positions. Rather, the most serious opposition to naturalism comes from the discipline of history. The best argument for the superiority of the scientific worldview over its rivals is the history of its rise to dominance—but this is a historical argument. It offers properly historical explanations that appeal to semantic, cultural and logical patterns as well as purely physical causes. It therefore presents a counterexample to the claim that natural science is the only source of knowledge and explanations worthy of the name.

### **What is spooky?**

For the sake of argument, suppose that the debates mentioned here turn out badly for full-strength naturalism. Suppose, that is, that the best account of the logic of historical explanation shows it to be fundamentally different from the logic of natural science; that the best philosophies of logic and mathematics posit arguments and mathematical objects that do not reduce to anything spatial-temporal; that the best philosophy of perception sets our sensory experiences outside the purview of natural science; that the best philosophical accounts of money, music and normativity are non-reductive and radically non-naturalist. Where would this leave humanism?

The world we imagine by supposing that all these debates go against full-strength naturalism would contain some abstract items that naturalists might regard as spooky, but it would not contain anything supernatural. Rigorous history may operate with concepts (such as ‘purpose’) and methods (such as contextualisation) that are foreign to natural science, but it shares the basic requirement that explanations must be subject to critical scrutiny and must offer rational grounds that fit with already established knowledge. Reference to supernatural causes fails this requirement, and the critical historian sets them aside as firmly as the natural scientist. Music, money and perception may not reduce to natural categories but they do supervene on physical processes. Even if abstract objects such as arguments and mathematical structures exist somehow independently of the spatial-temporal realm of natural science, they do not have any magical causal powers. Arguments are only ever causally effective when people speak them, write them or otherwise perform them (and even then, their effects are often only loosely related to their content). Mathematical structures only make a difference when people represent them in diagrams or notation (or in special cases, in thought) and then manipulate the representations. We live in a ‘disenchanted’, that is, magic-free world, not just because scientists and historians say so, but because our society runs on effective, efficient natural causality. When a car fails to start, we may mutter ‘gremlins’, but our serious, earnest efforts are directed towards finding and fixing the mechanical fault. Attempts to re-enchant the world, either with epic art (Wagner, Tolkien) or pointedly pre-modern religious movements (neo-paganism, religious fundamentalisms), fail because we understand too much about the world and our place in it.<sup>9</sup>

In other words, it is perfectly possible to recognise that meaningful human activity creates or refers to objects and domains beyond the reach of natural science without suggesting that there are purposes and meanings at work in the world other than those present in the activities of naturally evolved creatures like us. Indeed, much of what matters most to humans and to humanism is invisible from the perspective of natural science. When theistic believers challenge atheists to explain the source of their morality, they often do so by representing the world as viewed from the natural scientific perspective (the ‘view from nowhere’) and observing, correctly, that from that angle, there is no morality visible. The best humanist reply to this is to deny that the natural scientific perspective is the only one available. The point of ethical action is visible, vividly so, from

within the dense web of practices, memories and ideas that we inhabit.<sup>10</sup> The serious, meaningful contrast to 'natural' is not 'supernatural'. It is 'cultural'.

The essentials of humanism have two aspects: a rejection of magical views of the universe in favour of some sort of naturalism, and a rejection of nihilism. The first aspect is relatively easy—the history and current successes of the natural sciences make an irresistible case for it. The subtle part, for humanists, is to establish a naturalism that is compatible with the anti-nihilist aspect.

### Further Reading

The question of how and why exactly natural science works as well as it does has an extensive literature. Here are some of the highlights:

Alan Chalmers. *What is this thing called science?* Queensland University Press and Open University Press, 1976.

Crick, Francis *What Mad Pursuit: A Personal View of Scientific Discovery*, New York: Basic Books, 1988.

Earman, John (ed.), *Inference, Explanation, and Other Frustrations: Essays in the Philosophy of Science*. Berkeley & Los Angeles, CA: University of California Press, 1992.

Feyerabend, Paul *Against Method: Outline of an Anarchistic Theory of Knowledge* (1975), (First edition in M. Radner & S. Winokur, eds., *Analyses of Theories and Methods of Physics and Psychology*, Minneapolis: University of Minnesota Press, 1970.)

Galison, Peter *How Experiments End* Chicago: University of Chicago Press, 1987.

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Holton, Gerald, *Thematic Origins of Scientific Thought, Kepler to Einstein*, 1st edition 1973, revised edition. Cambridge, MA: Harvard University Press, 1988.

Kitcher, Philip *The Advancement of Science: Science Without Legend, Objectivity Without Illusions* Oxford: Oxford University Press, 1993.

Kuhn, Thomas S. [\*The Structure of Scientific Revolutions\*](#). Chicago: University of Chicago Press, 1962 (second edition with postscript 1970).

Kuhn, Thomas S. *The Essential Tension, Selected Studies in Scientific Tradition and Change*, Chicago: University of Chicago Press, 1977.

Lakatos, Imre *Philosophical Papers* (volumes 1 and 2). Worrall and Currie (eds), Cambridge: Cambridge University Press, 1978.

Losee, John *A Historical Introduction to the Philosophy of Science*, Oxford, UK: Oxford University Press, 1972. 2nd edition, 1980.

Popper, Karl R., *Logic of Scientific Discovery*. London: Routledge. First published in English 1959.

Salmon, Wesley C., *Four Decades of Scientific Explanation*, Minneapolis: University of Minnesota Press, 1990.

The philosophy of history and its relation to natural science in this article draws heavily on the work of Robin G Collingwood, specifically *The Idea of Nature* (Oxford: OUP, 1960, Knox ed.) and *The Idea of History* (Oxford: OUP, 1994 Revised edition; J. van der Dussen ed.).

Carl Hempel and Ernest Nagel developed a rival view of history that represents historical explanation as being similar to natural scientific explanation. The controversy played out in William Dray *Laws and explanation in history* (London: Oxford University Press, 1957).

The general question of the place of human life in a naturalistic, non-magic cosmos has its locus classicus in Sellars' paper:

Sellars, Wilfred "Philosophy and the Scientific Image of Man" in *Science, Perception and Reality* (London: Routledge & Kegan Paul Ltd; and New York: The Humanities Press, 1963); reissued in 1991 by Ridgeview Publishing Co., Atascadero, CA. Reprinted in Scharp, K. and R. B. Brandom, (eds.) *In the Space of Reasons: Selected Essays of Wilfrid Sellars* (Cambridge, MA: Harvard University Press, 2007).

Since this question spreads itself over the whole of epistemology and metaphysics, here is a handful of representative titles:

Draper, P., 'God, Science, and Naturalism', in W. Wainwright (ed.), *The Oxford Handbook of Philosophy of Religion* (Oxford: Oxford University Press, 2005)

Dupré, John *Human Nature and the Limits of Science*. Oxford: OUP, 2001.

Feldman, Richard "Methodological Naturalism in Epistemology," in *The Blackwell Guide to Epistemology*, edited by John Greco and Ernest Sosa (Malden, Ma: Blackwell, 1999) pp. 170–186.

Jackson, F. 'What Mary Didn't Know' *Journal of Philosophy*, 1986 83: pp. 291-295.

Kornblith, Hilary *Naturalizing Epistemology*, 2<sup>nd</sup> Edition, Cambridge: MIT Press, 1994.

Krikorian, Y. (ed.) *Naturalism and the Human Spirit*, New York: Columbia University Press, 1944.

Mackie, J. *Ethics: Inventing right and wrong*, Harmondsworth: Penguin, 1977.

Nagel, Thomas *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature is Almost Certainly False*. Oxford University Press, 2012.

Plantinga, A., , 'Methodological Naturalism?', in J. van der Meer (ed.), *Facets of Faith and Science* (Lanham, MD: University Press of America, 1996).

Tallis, Raymond *Aping Mankind: Neuromania, Darwinitis and the Misrepresentation of Humanity*. Acumen, 2011.

Turner, F., *Between Science and Religion. The Reaction to Scientific Naturalism in Late Victorian England* (New Haven: Yale University Press, 1974).

## Notes

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<sup>1</sup> <http://humanism.org.uk/humanism/>

<sup>2</sup> Even Richard Norman, who is by no means narrowly scientific in his approach, relies in his book *On Humanism* (London: Routledge, 2004) on science to undermine religion.

<sup>3</sup> Wilfred Sellars *Science, Perception and Reality* (London: Routledge & Kegan Paul Ltd, 1963) p. 173. Note the conscious echo of Aristotle's definition of truth (*Metaphysics* 1011b25). See also Plato (*Cratylus* 385b2, *Sophist* 263b).

<sup>4</sup> Galileo, Descartes, Locke, all reaching back to Aristotle's 'common sensibles', that is, features of an object that can be detected by more than one sense-organ.

<sup>5</sup> See Larry Laudan 'Progress or Rationality? The prospects for normative naturalism' *American Philosophical Quarterly* 24/1 (1987) pp. 19-31, reprinted in Papineau (ed.) *The Philosophy of Science* (Oxford: OUP, 1996).

<sup>6</sup> Historians of science routinely deny that there is a single logical device called 'the scientific method' common to all the successful empirical sciences. The history of science derives much of its interest from the exploration of changes in method over time and variations in methods between enquiries. This receives philosophical backing, notoriously from Feyerabend but more soberly from Kitcher and others (see further reading).

<sup>7</sup> *Discoveries and Opinions of Galileo*, trans. Stillman Drake (Garden City, N.Y: Doubleday, 1957)pp. 237-238.

<sup>8</sup> The history (and especially the *pre*-history) of science reveals what is wrong with the argument that Alvin Plantinga has developed (*Warrant and Proper Function* (Oxford: OUP, 1993) p. 256; *Warranted Christian Belief* (Oxford: OUP, 2000) p. 528; Plantinga & Tooley *Knowledge of God* (Oxford: Blackwell Publishing, 2008) p. 280). This argument proceeds by challenging naturalists to explain how unguided evolution has given us reliable cognitive faculties. The history and pre-history of science show that we do not have reliable cognitive faculties. Rather, history teaches that most human beliefs on most topics are not just false but well wide of the truth. It is only under special institutional conditions that we start to get a few things right, and even then there are no guarantees. Plantinga's argument goes wrong by focussing on beliefs of individuals, whereas it is the collective enterprises of science and scholarship that give us reliable knowledge.

<sup>9</sup> For an extended version of this argument, see Max Weber 'Science as a Vocation' in *From Max Weber: Essays in Sociology*. Gerth & Wright Mills (eds) (London: Routledge, 1948), especially p. 155.

<sup>10</sup> I develop this thought at more length in "[Williams on Dawkins - Response](#)" in *Think* 26, Vol. 9 (Autumn 2010) pp. 21-27