

4

HOW THE EXISTENCE OF GOD EXPLAINS THE WORLD AND ITS ORDER

The Universe and its Natural Laws

There is a physical universe consisting of innumerable differently sized chunks of matter. Our earth is one of several planets which travel around the sun, which is a small star, a big ball of flame. The star is one of many millions of stars in our galaxy, our group of stars, the Milky Way. Our galaxy belongs to a local cluster of galaxies, and astronomers can observe many thousands of millions of such clusters. Although very largely uniform, the universe contains much local 'clumping'. The stars and the planets are of different sizes, and planets such as our own are uneven in all sorts of ways—consider the differently sized and shaped pebbles on the sea shore.

It is extraordinary that there should exist anything at all. Surely the most natural state of affairs is simply nothing: no universe, no God, nothing. But there is something. And so

many things. Maybe chance could have thrown up the odd electron. But so many particles! Not everything will have an explanation. But, as we have seen, the whole progress of science and all other intellectual enquiry demands that we postulate the smallest number of brute facts. If we can explain the many bits of the universe by one simple being which keeps them in existence, we should do so—even if inevitably we cannot explain the existence of that simple being.

Yet not merely are there enormous numbers of things, but they all behave in exactly the same way. The same laws of nature govern the most distant galaxies we can observe through our telescopes as operate on earth, and the same laws govern the earliest events in time to which we can infer as operate today. Or, as I prefer to put it, every object, however distant in time and space from ourselves, has the same powers and the same liabilities to exercise those powers as do the electrons and protons of which our own bodies are made. If there is no cause of this, it would be a most extraordinary coincidence—too extraordinary for any rational person to believe. But science cannot explain why every object has the same powers and liabilities. It can explain why an object has one power in virtue of it having some wider power (why this local law of nature operates in virtue of some more general law of nature operating). But it could not conceivably explain why each object has the most general powers it does. Suppose that Newton's three laws of motion and his law of gravitational attraction are the fundamental laws of nature. Then what that means is that every atom, every electron, and so on attracts every other object in the universe with exactly the same attractive force (i.e. one which varies with the square of their distance apart). Now Newton's laws are not the fundamental laws of nature; they hold very accurately but not

totally accurately, and only when the bodies with which they deal are not too massive and not moving too fast. But, to the extent to which Newton's laws do hold, that is because they follow from the laws of General Relativity and Quantum Theory; and maybe these are the consequences of some more general theory—Grand Unified Theory. But, wherever we stop, the same general point applies. Suppose we stop with Grand Unified Theory. Then every atom and every electron in the universe has just the same powers and liabilities—those described by Grand Unified Theory. And that, if you allow yourself only scientific explanations, is where you stop. That, says the materialist, is just how things are.

But that sort of stopping place is just where no rational enquirer will stop. If all the coins found on an archaeological site have the same markings, or all the documents in a room are written with the same characteristic handwriting, we look for an explanation in terms of a common source. The apparently coincidental cries out for explanation.

It is not merely that all material objects have the same very general powers and liabilities as each other (e.g. behaving in accord with Grand Unified Theory); but they fall into kinds, members of which behave like each other in more specific ways. Each electron behaves like each other electron in repelling every other electron with the same electrical force. And larger objects fall into kinds, too. Oak trees behave like other oak trees, and tigers like other tigers. And many of these respects in which all material objects and objects of particular kinds behave like each other (for almost all the time) are also simple and so easily detectable by human beings.

It might have happened that the ultimate constituents of matter (electrons, protons, photons, and suchlike, or whatever they are made of) behaved in the same simple ways, but

that, when they came together to make medium-sized material objects, they behaved in such a complicated way that, from a mere superficial study of their behaviour, humans could never predict what would happen. Maybe one day rocks would fall apart, and on another day they would float in the air—but mere unscientific observation would not lead us to have the slightest idea which would happen when. But fortunately our world is not like that.

In our world there are regularities in the behaviour of medium-sized objects which can be readily detected and used by the unscientific—regularities which hold for almost all the time and to a high degree of approximation. Heavy objects fall to the ground, humans and other land animals need air to live, seeds planted and watered grow into plants, bread nourishes humans but grass does not. And so on. There are, of course, exceptions—there are cases when heavy objects will not fall to the ground (e.g. if they are heavily magnetized so as to be repelled by a magnet beneath them); and only a scientist can predict *exactly* how long an object will take to fall, and *exactly* how much bread humans need for normal activities. The obvious approximate regularities which humans can readily detect are ones with important consequences for whether we live or die (eat enough to live, escape predators and accidents), how we can mate, have children, keep warm, travel, and so on. By observing and understanding these regularities, humans can then utilize them to make a difference to the world outside our bodies, and thereby to our own lives. We need true beliefs about the effects of our basic actions if through them we are to make a difference to the world. But only if objects behave in regular ways sufficiently simple to be understood by humans will we be able to acquire those beliefs. By observing that bread nourishes, we can then take steps to stay alive by

eating bread. By observing that seeds (including grains of wheat) when planted and watered grow into plants, we can then take steps to grow wheat to make into bread. And so on. But if material objects behaved totally erratically, we would never be able to choose to control the world or our own lives in any way. So, in seeking an explanation of why all material objects have the same simple powers and liabilities as each other, we should seek one which explains why they are such that the approximate powers and liabilities of medium-sized material objects (including those of importance for human life) which follow therefrom are readily detectable by humans. For it is a pervasive feature of all material objects—that their powers and liabilities are such as to have this consequence.

The simple hypothesis of theism leads us to expect all the phenomena which I have been describing with some reasonable degree of probability. God being omnipotent is able to produce a world orderly in these respects. And he has good reason to choose to do so: a world containing human persons is a good thing. Persons have experiences, and thoughts, and can make choices, and their choices can make big differences to themselves, to others, and to the inanimate world. God, being perfectly good, is generous. He wants to share. And there is a particular kind of goodness in human persons with bodies in a law-governed universe. With a body we have a limited chunk of matter under our control, and, if we so choose, we can choose to learn how the world works and so learn which bodily actions will have more remote effects. We can learn quickly when rocks are likely to fall, predators to pounce, and plants to grow. Thereby God allows us to share in his creative activity of choosing. We can make choices: crucial for ourselves—whether to avoid falling rocks, to escape from predators, to plant crops in order to get enough to eat,

or not to bother; whether to build houses and live comfortably or to be content with a more primitive life-style. And we can make choices crucial for others—whether to give them food or let them starve.

But, because the approximate observable regularities in the behaviour of medium-sized objects are due to more precise regularities in the behaviour of their small-scale components, we can, if we so choose, try to find out what are these latter components. With this knowledge we can build instruments which extend further our knowledge and control of the world. Humans can discover the laws of dynamics and chemistry and so make cars and aeroplanes, or—alternatively—bombs and guns; and so extend the range of our power from control merely of our bodies and their local environment to a much wider control of the world. Embodiment in an orderly world gives the possibility not merely of quick learning of regularities utilizable for survival, but of science and technology—of discovering by co-operative effort over the years deep laws which can be utilized to rebuild our world in the ways we choose. It is up to us whether we choose to learn and extend control, and up to us how we extend control. Like a good parent, a generous God has reason for not foisting on us a certain fixed measure of knowledge and control, but rather for giving us a choice of whether to grow in knowledge and control.

It is because it provides these opportunities for humans that God has a reason to create a world governed by natural laws of the kind we find. Of course God has reason to make many other things, and I would hesitate to say that one could be certain that he would make such a world. But clearly it is the sort of thing that there is some significant probability that he will make.

The suitability of the world as a theatre for humans is not

the only reason for God to make an orderly world. The higher animals too are conscious, learn, and plan—and the predictability of things in their most easily detectable aspects enables them to do so. But beyond that an orderly world is a beautiful world. Beauty consists in patterns of order. Total chaos is ugly. The movements of the stars in accord with regular laws is a beautiful dance. The medievals thought of the planets as carried by spheres through the sky, and their regular movements producing the 'music of the spheres' whose beauty humans casually ignored, although it was one of the most beautiful things there is. God has reason to make an orderly world, because beauty is a good thing—in my view whether or not anyone ever observes it, but certainly if only one person ever observes it.

The argument to God from the world and its regularity is, I believe, a codification by philosophers of a natural and rational reaction to an orderly world deeply embedded in the human consciousness. Humans see the comprehensibility of the world as evidence of a comprehending creator. The prophet Jeremiah lived in an age in which the existence of a creator-god of some sort was taken for granted. What was at stake was the extent of his goodness, knowledge, and power. Jeremiah argued from the order of the world that he was a powerful and reliable god, that god was the sort of God that I described in Chapter 1. Jeremiah argued to the power of the creator from the extent of the creation—'The host of heaven cannot be numbered, neither the sand of the sea measured' (Jer. 33: 22); and he argued that its regular behaviour showed the reliability of the creator, and he spoke of the 'covenant of the day and night' whereby they follow each other regularly, and 'the ordinances of heaven and earth' (Jer. 33: 20–1 and 25–6).

The orderly behaviour of material bodies, which he describes as their tendency to move towards a goal (e.g. the falling body tending towards the ground, the air bubbling up through water), was the basis of the fifth of St Thomas Aquinas's 'five ways' to prove the existence of God:

The fifth way is based on the guidedness of things. For we see that certain things lacking awareness, viz, natural bodies, move so as to attain a goal. This is evident from the fact that always or very frequently they behave in the same way and there follows the best result—which shows that they truly tend to a goal, and do not merely hit it by accident. Nothing however that lacks awareness tends to a goal, except under the direction of someone with awareness and with understanding: the arrow, for example, requires an archer. Everything in nature, therefore, is directed to its goal by someone with understanding and this we call 'God'.

(*Summa Theologiae* Ia 2.3)

The argument from the existence and regular behaviour of material objects to a God who keeps them in existence with the same powers and liabilities as each other is an argument which satisfies very well the criteria set out in Chapter 2. The hypothesis of theism is a simple hypothesis which leads us to expect these observable phenomena, when no other hypothesis will do so. On the materialist hypothesis it is a mere coincidence that material objects have the same powers as each other, and not a simple stopping point for explanation. Because theism satisfies the criteria well, the existence and regular behaviour of material objects provide good evidence for the existence of God.

Human and Animal Bodies

The orderliness of nature in the regular behaviour of objects over time, codified in natural laws, is not the only facet of the orderliness of the natural world. There is also the marvellous order of human and animal bodies. They are like very very complicated machines. They have delicate sense organs which are sensitive to so many aspects of the environment, and cause us to have true beliefs about our environment. We learn where the objects around us are, where our friends are and where our enemies are, where there is food and where there is poison—through our eyes turning light rays and our ears turning sound waves into nerve impulses. And by using these resultant beliefs we can move ourselves, our arms and hands and mouths—to climb and hold rocks and talk—as basic actions in ways which enable us to achieve all sorts of diverse goals (including those needed for our survival). The complex and intricate organization of human and animal bodies, which made them effective vehicles for us to acquire knowledge and perform actions in these ways, was something which struck the anatomists and naturalists of the eighteenth century even more than those of earlier centuries (partly because the invention of the microscope at the end of the seventeenth century allowed them to see just how intricately organized those bodies were).

Very many eighteenth-century writers argued that there was no reason to suppose that chance would throw up such beautiful organization, whereas God was able to do so and had abundant reason to do so—in the goodness, to which I have drawn attention in my own way earlier in the chapter, of the existence of embodied animals and humans. Hence their existence, they argued, was good evidence of the existence of

God. I believe this argument (as so far stated) to be correct, by the criteria given in Chapter 2. God has reason for creating embodied persons and animals, and so for creating human and animal bodies. With such bodies we can choose whether to grow in knowledge and control of the world (given that it is an orderly world). God is able to bring about the existence of such bodies. That he does so, we saw in Chapter 3, is a simple hypothesis. Hence there is good reason to believe that God is the creator of human and animal bodies. Their existence provides another strand of evidence (additional to that provided by the existence of the universe and its conformity to natural laws) for the existence of God.

The best-known presentation of this argument was by William Paley in his *Natural Theology* (1806), which begins with the famous passage:

In crossing a heath, suppose I pitched my foot against a stone, and were asked how the stone came to be there, I might possibly answer, that, for anything I knew to the contrary, it had lain there for ever; nor would it, perhaps, be very easy to show the absurdity of this answer. But suppose I had found a watch upon the ground, and it should be inquired how the watch happened to be in that place, I should hardly think of the answer which I had before given—that, for anything I knew, the watch might have always been there. Yet why should not this answer serve for the watch as well as for the stone? Why is it not as admissible in the second case as in the first? For this reason, and for no other, viz., that, when we come to inspect the watch, we perceive (what we could not discover in the stone) that its several parts are framed and put together for a purpose, e.g., that they are so formed and adjusted as to produce motion, and that motion so regulated as to point out the hour of the day; that, if the different parts had been differently shaped from what they are, of a different size from what they are, or placed after any other manner, or in any other order than that in which

they are placed, either no motion at all would have been carried on in the machine, or none which would have answered the use that is now served by it . . . The inference, we think, is inevitable, that the watch must have had a maker: that there must have existed, at some time, and at some place or other, an artificer or artificers who formed it for the purpose which we find it actually to answer; who comprehended its construction, and designed its use.

The rest of Paley's book is devoted to showing how well built in all their intricate detail are animals and humans, and so to concluding that they must have had God as their maker. This analogy of animals to complex machines seems to me correct, and its conclusion justified.

The argument does not, however, give any reason to suppose that God made humans and animals as a basic act on one particular day in history, rather than through a gradual process. And, as we now know, humans and animals did come into existence through the gradual process of evolution from a primitive soup of matter which formed as earth cooled down some 4,000 million years ago. In that process natural selection played a central role. Darwin's *Origin of Species* (1859) taught us the outlines of the story, and biologists have been filling in the details ever since. The clear simple modern presentation in Richard Dawkins's *The Blind Watchmaker* (1986) is deservedly popular.

Because the story is so well known, I shall summarize it in a quick and very condensed paragraph. Molecules of the primitive soup combined by chance into a very simple form of life which reproduced itself. It produced offspring very similar to itself but each of them differing slightly by chance in various respects. In virtue of these differences, some of the offspring were better adapted to survive and so survived; others were not well equipped to survive and did not survive. The next

generations of offspring produced on average the characteristics of their parents, but exhibited slight variations from them in various ways. The more a characteristic gave an advantage in the struggle for survival, the more evolution favoured its development. Other things being equal, complexity of organization was a characteristic with survival value, and so more complex organisms began to appear on earth. A characteristic which gave an advantage to complex organisms was sexual reproduction, and so gradually today's male and female organisms evolved. Whatever characteristic of an animal you name, there is a story to be told of how it came to have that characteristic in terms of it being one of many characteristics which were slight variants on the characteristics of parents, and it giving an advantage in the struggle for survival over the other characteristics. Once upon a time giraffes had necks of the same length as other animals of their bodily size. But by chance some giraffe couples produced offspring with longer necks than usual. These offspring with the longer necks were better able to reach food (e.g. leaves in the tree tops) than the others, and so they flourished and more of them survived to have more offspring than did those with shorter necks. The offspring of the longer-necked giraffes had on average necks of the same lengths as their own parents, but some had ones slightly longer and others had ones slightly shorter. There was an advantage in even longer necks, and so the average neck of the population became longer. But giraffes with very long necks proved less able to escape from predators—they could not escape from woods or run so fast when pursued by lions. So the length of giraffe necks stabilized at an optimum size—long enough for giraffes to get the leaves but not so long as to make them unable to escape from predators. That, or something like it, is the explanation of why the giraffe has a

long neck. And there is a similar story to be told for every animal and human characteristic. A little sensitivity to light gave some advantage (to many animals in many environments) in the struggle for survival, a little more sensitivity gave more advantage, and hence the eye developed in many animals. And, above all, complexity of nervous organization in supporting a range of sense organs and bodily movements gave great advantage, and so we have the complexly organized animals and humans we have today.

So, in summary, the Darwinian explanation of why there are the complex animal and human bodies there are today is that once upon a time there were certain chemicals on earth, and, given the laws of evolution (e.g. reproduction with slight variation), it was probable that complex organisms would emerge. This explanation of the existence of complex organisms is surely a correct explanation, but it is not an ultimate explanation of that fact. For an ultimate explanation we need an explanation at the highest level of why those laws rather than any other ones operated. The laws of evolution are no doubt consequences of laws of chemistry governing the organic matter of which animals are made. And the laws of chemistry hold because the fundamental laws of physics hold. But why just those fundamental laws of physics rather than any others? If the laws of physics did not have the consequence that some chemical arrangement would give rise to life, or that there would be random variations by offspring from characteristics of parents, and so on, there would be no evolution by natural selection. So, even given that there are laws of nature (i.e. that material objects have the same powers and liabilities as each other), why just those laws? The materialist says that there is no explanation. The theist claims that God has a reason for bringing about those laws because those laws

have the consequence that eventually animals and humans evolve.

Even given that the laws of physics are such as to give rise to laws of evolution of complex organisms from a certain primitive soup of matter, animals and humans will evolve only if there is a primitive soup with the right chemical constitution to start with. Some soups different in chemical constitution from that from which the earth actually began would also, given the actual laws of physics, have given rise to animals. But most soups of chemical elements made from differently arranged fundamental particles would not have given rise to animals. So why was there that particular primitive soup? We can trace the history of the world further backwards. The primitive soup existed because the earth was formed in the way it was; and the earth was formed in the way it was because the galaxy was formed in the way it was, and so on . . . until we come right back to the Big Bang, the explosion 15,000 million years ago with which apparently the universe began. Recent scientific work has drawn attention to the fact that the universe is 'fine tuned'. The matter-energy at the time of the Big Bang had to have a certain density and a certain velocity of recession to bring forth life. (For a simple account of some of this work, see John Leslie, *Universes* (1989).) Increase or decrease in these respects by one part in a million would have had the effect that the universe was not life evolving. For example, if the Big Bang had caused the chunks of matter-energy to recede from each other a little more quickly, no galaxies, stars, or planets, and no environment suitable for life, would have been formed on earth or anywhere else in the universe. If the recession had been marginally slower, the universe would have collapsed in on itself before life could have been formed. If there is an ultimate

scientific explanation, it will have to leave it as a brute fact that the universe began in such a state and had such natural laws as to be life evolving, when a marginal difference in those initial conditions would have ensured that no life ever evolved anywhere.

Of course, the universe may not have had a beginning with a Big Bang, but may have lasted forever. Even so, its matter must have had certain general features if at any time there was to be a state of the universe suited to produce animals and humans. There would need, for example, to be enough matter but not too much of it for chemical substances to be built up at some time or other—a lot of fundamental particles are needed but with large spaces between them. And only a certain range of laws would allow there to be animals and humans at any time ever. The recent scientific work on the fine-tuning of the universe has drawn attention to the fact that, whether or not the universe had a beginning, if it had laws of anything like the same kind as our actual ones (e.g. a law of gravitational attraction and the laws of the three other forces which physicists have analysed—electromagnetism, the strong nuclear force, and the weak nuclear force), the constants of those laws would need to lie within narrow bands if there was ever to be life anywhere in the universe. Again the materialist will have to leave it as an ultimate brute fact that an everlasting universe and its laws had those characteristics, whereas the theist has a simple ultimate explanation of why things are thus, following from his basic hypothesis which also leads him to expect the other phenomena we have been describing.

True, God could have created humans without doing so by the long process of evolution. But that is only an objection to the theistic hypothesis if you suppose that God's only reason for creating anything is for the sake of human beings. To

repeat my earlier point—God also has reason to bring about animals. Animals are conscious beings who enjoy much life and perform intentional actions, even if they do not choose freely which ones to do. Of course God has a reason for giving life to elephants and giraffes, tigers and snails. And anyway the beauty of the evolution of the inanimate world from the Big Bang (or from eternity) would be quite enough of a reason for producing it, even if God were the only person to have observed it. But he is not; we ourselves can now admire earlier and earlier stages of cosmic evolution through our telescopes. God paints with a big brush from a large paintbox and he has no need to be stingy with the paint he uses to paint a beautiful universe.

Darwin showed that the universe is a machine for making animals and humans. But it is misleading to gloss that correct point in the way that Richard Dawkins does: 'our own existence once presented the greatest of all mysteries, but . . . it is a mystery no longer . . . Darwin and Wallace solved it' (*The Blind Watchmaker*, p. xiii). It is misleading because it ignores the interesting question of whether the existence and operation of that machine, the factors which Darwin (and Wallace) cited to explain 'our own existence', themselves have a further explanation. I have argued that the principles of rational enquiry suggest that they do. Darwin gave a correct explanation of the existence of animals and humans; but not, I think, an ultimate one. The watch may have been made with the aid of some blind screwdrivers (or even a blind watchmaking machine), but they were guided by a watchmaker with some very clear sight.

Stephen Hawking has suggested that the universe is not infinitely old, but that nevertheless it did not have a beginning, and so there was no need for it to begin in a particular

initial state if animals and humans were to emerge. He suggests, as Einstein did, that space is closed—finite but without a boundary. Three-dimensional space, that is, is like the two-dimensional surface of a sphere. If you travel in any direction along the surface of a sphere, you will come back to your starting-point from the opposite side. It is indeed possible that three-dimensional space is also like this, though that remains a matter on which there is no scientific consensus. But Hawking also makes the paradoxical ‘proposal’ that the same is true with respect to time (see *A Brief History of Time* (1985), 136): time is closed because it is cyclical—if you live long enough after 1995 into the future, you would find yourself coming from 1994 into 1995 (looking and feeling just like you do now). Hawking claims that the ‘real’ test of his proposal is whether his theory which embodies it ‘makes predictions that agree with observation’. But that is not the only test which his proposal must pass. As I noted in Chapter 2, a theory which entails a contradiction cannot be true, however successful it is in making predictions. And the ‘proposal’ that time is cyclical to my mind does entail a contradiction. It entails that tomorrow is both after and before today (because if you live long enough after tomorrow, you will find yourself back to today). That in turn entails that I today cause events tomorrow which in turn by a long causal chain cause my own existence today. But it is at any rate logically possible (whether or not possible in practice) that I should freely make different choices from the ones which I do make today; and in that case I could choose so to act today as to ensure that my parents were never born and so I never existed—which is a contradiction. Cyclical time allows the possibility of my acting so as to cause my not acting. And, since that is not possible, cyclical time is not possible. In saying this, I have no wish

to challenge the correctness of Hawking’s equations as parts of a theory which predicts observations. But I do wish to challenge the interpretation in words which Hawking gives of those equations.

The use to which Hawking puts his ‘proposal’ is contained in this paragraph:

The idea that space and time may form a closed surface without boundary also has profound implications for the role of God in the affairs of the universe. With the success of scientific theories in describing events, most people have come to believe that God allows the universe to evolve according to a set of laws and does not intervene in the universe to break these laws. However, the laws do not tell us what the universe should have looked like when it started—it would still be up to God to wind up the clockwork and choose how to start it off. So long as the universe had a beginning, we could suppose it had a creator. But if the universe is really completely self-contained, having no boundary or edge, it would have neither beginning nor end: it would simply be. What place, then, for a creator?

(*A Brief History of Time*, 140–1)

The theist’s answer to this paragraph is twofold. First, whether or not God ever intervenes in the universe to break his laws, according to theism, he certainly can do so; and the continued operation of these laws is due to his constant conserving of them, his choosing not to break them. And, secondly, if the universe had a beginning, God made it begin one way rather than another. If the universe did not have a beginning, the only alternative is that it is everlasting. In that case, God may be held to keep it in being at each moment with the laws of nature as they are. It is through his choice at each moment that it exists at that moment and the laws of nature are as they are then. The grounds for believing this theistic

answer to Hawking to be not merely possible but true are those being set out in this book.

An objector may invoke a form of what is known as the *anthropic principle* to urge that, unless the universe exhibited order of the kinds which I have described (simple laws operating on matter in such a way as to lead to the evolution of animals and humans), there would not be any humans alive to comment on the fact. (If there were no natural laws, there would be no regularly functioning organisms, and so no humans.) Hence there is nothing surprising in the fact that we find order—we could not possibly find anything else. (This conclusion is clearly a little too strong. There would need to be quite a bit of order in and around our bodies if we are to exist and think, but there could be chaos outside the earth, so long as the earth was largely unaffected by that chaos. There is a great deal more order in the world than is necessary for the existence of humans. So there could still be humans to comment on the fact, even if the world were a much less orderly place than it is.) But, quite apart from this minor consideration, the argument still fails totally for a reason which can best be brought out by an analogy. Suppose that a madman kidnaps a victim and shuts him in a room with a card-shuffling machine. The machine shuffles ten packs of cards simultaneously and then draws a card from each pack and exhibits simultaneously the ten cards. The kidnapper tells the victim that he will shortly set the machine to work and it will exhibit its first draw, but that, unless the draw consists of an ace of hearts from each pack, the machine will simultaneously set off an explosion which will kill the victim, in consequence of which he will not see which cards the machine drew. The machine is then set to work, and to the amazement and relief of the victim the machine exhibits an ace of hearts drawn from

each pack. The victim thinks that this extraordinary fact needs an explanation in terms of the machine having been rigged in some way. But the kidnapper, who now reappears, casts doubt on this suggestion. 'It is hardly surprising', he says, 'that the machine draws only aces of hearts. You could not possibly see anything else. For you would not be here to see anything at all, if any other cards had been drawn.' But, of course, the victim is right and the kidnapper is wrong. There is indeed something extraordinary in need of explanation in ten aces of hearts being drawn. The fact that this peculiar order is a necessary condition of the draw being perceived at all makes what is perceived no less extraordinary and in need of explanation. The theist's starting-point is not that we perceive order rather than disorder, but that order rather than disorder is there. Maybe only if order is there can we know what is there, but that makes what is there no less extraordinary and in need of explanation. True, every draw, every arrangement of matter, is equally improbable a priori—that is, if chance alone dictates what is drawn. But if a person is arranging things, he has reason to produce some arrangements rather than others (ten aces of hearts, a world fine tuned to produce animals and humans). And if we find such arrangements, that is reason for supposing that a person is doing the arranging.

Another objector may advocate what is called the *many-worlds* theory. He may say that, if there are trillions and trillions of universes, exhibiting between them all the possible kinds of order and disorder there can be, it is inevitable that there will be one governed by simple comprehensible laws which give rise to animals and humans. True. But there is no reason to suppose that there are any universes other than our own. (By 'our universe' I mean all the stars and other heavenly bodies which lie in some direction at some distance, how-

ever large, from ourselves; everything we can see in the night sky, and everything there too small to be seen, and everything further away than that.) Every object of which we know is an observable component of our universe, or postulated to explain such objects. To postulate a trillion trillion other universes, rather than one God in order to explain the orderliness of our universe, seems the height of irrationality.

So there is our universe. It is characterized by vast, all-pervasive temporal order, the conformity of nature to formula, recorded in the scientific laws formulated by humans. It started off in such a way (or through eternity has been characterized by such features) as to lead to the evolution of animals and humans. These phenomena are clearly things 'too big' for science to explain. They are where science stops. They constitute the framework of science itself. I have argued that it is not a rational conclusion to suppose that explanation stops where science does, and so we should look for a personal explanation of the existence, conformity to law, and evolutionary potential of the universe. Theism provides just such an explanation. That is strong grounds for believing it to be true—by the criteria which I set out in Chapter 2. Note that I am not postulating a 'God of the gaps', a god merely to explain the things which science has not yet explained. I am postulating a God to explain what science explains; I do not deny that science explains, but I postulate God to explain why science explains. The very success of science in showing us how deeply orderly the natural world is provides strong grounds for believing that there is an even deeper cause of that order.