

necessary truth. Such propositions as "Stockholm is the capital of Sweden" and "Mars has two moons" and "Spiders have eight legs" and "British forces under the command of Lord Elgin burned the Summer Palace at Peking in 1860" would be necessary truths in the same sense as that in which "5 + 7 = 12" and "There are no liquid wine bottles" are necessary truths. But this is absurd. We must therefore conclude that the Principle of Sufficient Reason is false.⁴ And, therefore, the crucial premise of the cosmological argument is false. (It is worth noting that if we were willing to accept the conclusion that every truth was a necessary truth, we should not need the cosmological argument. The conclusion we derived from this argument was that if something exists, then it is a necessary truth that something exists. But this obviously follows from the thesis that all truths are necessary truths. Another way to put this point would be to say that it is not very surprising that if a certain proposition entails that all truths are necessary truths, then it is possible to construct an argument, an argument having that proposition as a premise, the conclusion of which is that if something exists, then it is a necessary truth that something exists.) If we suppose that there is real contingency in the world, then we must regard the question, Why is there anything at all? as still unanswered.

The arguments we have considered do not rule out the possibility of showing that there is a necessary being by employing some "restricted" version of the Principle of Sufficient Reason, some weaker principle of the same type that does not entail that all truths are necessary truths. One might, for example, try to discover a plausible principle according to which many truths (including 'There are contingent beings') have a sufficient reason, although some truths (including the set of all truths, that is, the conjunction of all true propositions into a single proposition) do not. Or one might try to discover a plausible principle that applies to all contingent truths but appeals to some notion weaker than "sufficient reason." A candidate for such a principle might be 'All contingent truths have at least a partial explanation'. (If an argument for the existence of a necessary being had this principle as a premise, it would also have to have a premise along the lines of 'If one is to give even a partial explanation of the existence of the members of any class of contingent beings, one must cite facts about the properties and relations of beings outside that class'. This idea is promising, but it needs work. What, one might ask, would a "partial" explanation of the truth of the proposition that is the conjunction of all true propositions look like? Would an explanation of the fact that Paris is the capital of France be a partial explanation of the truth of the proposition that is the conjunction of all true propositions? If so, the premise mentioned in the parenthesis doesn't seem very plausible. If not, how plausible is it to suppose that the truth of the proposition that is the conjunction of all true propositions has even a partial explanation? I will consider one argument of the first type, an argument that appeals to a principle according to which all facts of a certain sort have an explanation: for every being that exists, there is an explanation of its existence.

Let us say that a being is an *independent being* if its existence depends on no beings outside itself. (That is, its existence depends on no beings but itself and its parts—if parts it has.) If a being is not independent, we call it *dependent*. It is important to realize that if a being depends on beings outside itself for its existence, it does not follow that those beings or any facts about them constitute a sufficient reason (in the sense demanded by the Principle of Sufficient Reason) for its existence. You and I, for ex-

ample, depend upon our parents and all our other ancestors for our existence. And, for all anyone knows, there is no explanation of the fact that my parents met and had offspring or of the fact that your parents met and had offspring. But if these facts indeed have no explanation, it is nevertheless true that you and I depend upon our parents for our existence and are therefore dependent beings.

All the beings we are aware of would seem to be dependent beings. What would an independent being be like? What would be a reasonable candidate for the office of independent being? Well, a necessary being looks like a pretty good candidate. (It is not, however, easily demonstrable that just any necessary being would be an independent being. Anyone who wanted to demonstrate this conclusion would have somehow to prove the impossibility of cases like the following one. Suppose that A is a necessary being and that A causes the existence of B and that it is necessary that A cause the existence of B. Then B will be a necessary being—B will exist in all possible worlds, since A exists in all possible worlds, and, in every possible world in which it exists, causes B to exist in that possible world—but B will nonetheless depend upon A for its existence.)

Could there be a being that was independent and *contingent*? It is possible to construct cases that suggest there could be. Suppose that a being "popped into existence" in empty space, and that there was no reason whatever for this: it just *did*. And (if this is not implied by what we have already supposed) let us suppose that no other being was in any way causally connected in the slightest, most remote degree with the coming into existence of this being. Since there was no reason whatever for this being's coming into existence, it can be plausibly maintained that it might just as well not have come into existence; it can be plausibly maintained, that is, that it is a contingent being. And, since its existence in no way depends on the existence or properties of any other being, it seems evident that it has to be classified as an independent being.

It is, moreover, not self-evidently impossible for there to be an independent and contingent being that has *always* existed. Suppose, for example, that there is a being, X, that has always existed and has always been made of the parts A, B, and C. Suppose X is essentially made of just those parts: suppose X could exist only if A, B, and C existed and were joined in a certain way. And suppose there is no necessity in the arrangement of A, B, and C; suppose it is perfectly possible for them to have been arranged in some other way. And suppose, finally, that A, B, and C do not depend for their existence or their arrangement on any other beings. Now either A, B, and C are all necessary beings or else at least one of them is contingent. If one of them is contingent, it is an independent and contingent being that has always existed. But even if all three of them are necessary beings, the being made of them, X, is an independent and contingent being that has always existed—for it would not have existed if A, B, and C had not been arranged just the way they are, and yet it does not depend on any being outside itself for its own existence.

It may nevertheless be that these cases represent only superficial possibilities and that it is impossible for there to be an independent and contingent being. If we consider the first (alleged) possibility, a being that simply pops into existence, we may feel a certain metaphysical unease. Isn't there something strange—something positively *weird*, as the contemporary idiom has it—about the idea of something's just popping into existence without *anything's* being even partly responsible for this event? The me-

divial philosophers had a slogan: *Ex nihilo nihil fit*: "Nothing comes from nothing." And this sounds like very good sense. Some may judge it to be self-evident. Others, however, may judge that it rests on the Principle of Sufficient Reason, taken together with the observation that if something really came from nothing, there could be no possible explanation of its existence, since there would be no objects or facts that could be cited in that explanation. And they may contend that if the Principle is discredited the medieval slogan is thereby discredited.

It is important to note, in connection with this slogan, however, that few people have ever denied it. It is not denied by the Judeo-Christian doctrine that God created the universe "from nothing," for that doctrine means only that God did not make the universe from some pre-existent material whose existence was independent of His will. After all, the doctrine of Creation implies that the universe depends for its existence on something outside itself and that it does not, therefore, violate the principle (propounded by Christian philosophers) that nothing comes from nothing. It was not denied by the cosmological model called "continuous creation" (popular in the 1950s), for, according to that model, the hydrogen atoms that "popped into existence" in empty space were caused to do so by the local gravitational potential, which was dependent on the distribution of already-existent matter. It is not denied by the currently standard cosmological model, the "Big Bang," for this model addresses only questions concerning events subsequent to the initial singularity. (The Big Bang model can be *supplemented* with an attempt to explain the singularity itself. One might, for example, supplement it with the thesis that God is responsible for the existence of the singularity. But all such supplements appeal to the existence of beings that did not themselves evolve out of the singularity. We shall presently examine an apparent exception to this generalization.) It is not denied by the ubiquitous "popping into existence" of so-called virtual particles that is a consequence of quantum field theory, for these particles pop into existence owing to the properties of a more fundamental physical entity called the quantum field (a point to which we shall presently return). The thesis that a being cannot simply pop into existence without any help from antecedently existent beings would therefore seem to be at least very plausible.

If it seems strange to suppose that there might be an independent and contingent being whose existence begins at a certain moment, it can seem hardly less strange to suppose that there might be an independent and contingent being that has always existed. Suppose that, one day while strolling through the forest, we were to come upon a mysterious translucent ball about two meters in diameter.⁵ It would not occur to us to doubt that there was some explanation for its existence—even if we were aware of the difficulties facing the Principle of Sufficient Reason. Even if we cannot accept the thesis that every fact has an explanation, we may be convinced that many facts—among them, the fact that this two-meter translucent ball exists—have explanations. And we cannot explain the fact that the ball exists by saying that it has always existed, even supposing it *has* always existed. No one would say that one could explain the existence of something that has always existed by citing the fact that it has always existed, but some philosophers would maintain that if a thing has always existed, it follows that there can be no explanation of its existence. (See, for example, the "second set of answers to our three metaphysical questions" in Chapter 1.) But it is certainly possible to imagine explanations of the existence of something that has always existed. If, for example, the

sun has always existed and has always been a radiating body, there has always been sunlight. And there will be an explanation of the fact that sunlight has always existed: "cause the sun has always existed and has always been a radiating body."

The conviction that there must be an explanation for existence of the translucent ball has nothing to do with the special features of that object. It is a consequence of more general conviction, a conviction that can be stated as a principle (a restricted version of the Principle of Sufficient Reason):

Every being has this feature: the fact that it exists has an explanation. ✓

(This is a much weaker principle than the Principle of Sufficient Reason. Consider our ball. This principle says that there must be an explanation of the fact that the ball exists; it does not say that there must be an explanation of the fact that it is two meters in diameter.)

If this restricted version of the Principle of Sufficient Reason is true, it seems to be plausible to suppose that there are no independent and contingent beings (what ones that had just popped into existence at some time in the past or ones that had ways existed). An equivalent statement of this plausible thesis would be this: if there are any beings that in no way or in any degree depend for their existence on themselves, those beings are necessary beings. The argument is this: for every being that exists, the fact that it exists has an explanation (so the restricted version of the Principle of Sufficient Reason tells us), and if a being is truly *independent*, then it can be only one explanation of any sort of its existence: that its nonexistence is impossible. (For what other form could an explanation of the existence of an independent being have? By definition, the explanation cannot cite any facts about the actions or properties of any beings outside that being.)

If there can be no independent and contingent beings, there is a plausible argument for the existence of a necessary being. This argument may be classified as a version of the cosmological argument, since it proceeds from the observation that there are beings to the conclusion that there is a necessary being. It is a very simple argument indeed:

When we look around us, we perceive various beings. Since there are beings, there must be a being that is the *totality* of beings: the World. The World is an independent being, since, by definition, nothing is outside the World. But an independent being must be a necessary being. Hence, the World is a necessary being. And it can plausibly be argued that there must also be other necessary beings, necessary beings that are *parts* of the World—at least if Monism is false and the World *has* parts. For it is a plausible thesis that a necessary being cannot be composed entirely of contingent parts. (Plausible but not self-evident. After all, an infinite being can be composed entirely of finite parts, and an eternal being could be composed entirely of short-lived parts. But it *does* seem plausible.) And yet, all the parts of the World we observe—Caesar, the Taj Mahal, the sun—are contingent beings. There must, therefore, be parts of the World we do not see that are necessary beings.

Is this a proof of the existence of a necessary being? (That is, are the first five sentences of the offset material a proof of the existence of a necessary being? Note that the subsequent part of the offset material is an argument for a *further* conclusion; it

this second argument is wrong—because, say, it is possible for a necessary being to be composed entirely of contingent beings—the first five sentences will “still” be an argument for the existence of a necessary being, and this argument is independent of the second argument.) Or is it at least a proof of the existence of a necessary being if the premise is granted that there cannot be an independent and contingent being? It is not, for it depends not only upon the premise that an independent and contingent being is impossible but upon another premise as well, and that second premise is very doubtful. It is this: that there exists a being that is the totality of all beings; that the *World* is a being, an individual thing. (We said in Chapter 2 that the question whether the *World*, the sum total of all individual things, was itself an individual thing would later become important.) The alternative to the *World*'s being an individual thing—it is obviously not a stuff or a universal or an event—is the *World*'s being a mere collection of individual things. If the *World* is a mere collection, then there is not in the strictest sense any such thing (any such *thing*) as “the *World*.” If the *World* is a mere collection, any use of the phrase ‘the *World*’ is a mere manner of speaking; use of this phrase is no more than a device for speaking collectively about all individual things. If every individual thing were, say, an elementary particle like an electron or a quark, then the words ‘the *World*’ would simply be a linguistic device—one that could no doubt be dispensed with in principle—for making general statements about the properties of elementary particles and the way they are distributed. (We must keep in mind throughout this discussion that the *World* is not necessarily the same as the cosmos or physical universe: That the cosmos is the *World* is a metaphysical theory, one that may or may not be true. If it is not true—because, say, the *World* contains God or some other individual thing that is not a part of the cosmos—the present discussion will be irrelevant to the question whether the cosmos is an individual thing. I raise this point because Kant said some things about the cosmos that bear some superficial resemblance to the thesis that the *World* is not an individual thing, and I want to dissociate the present discussion from Kant's views. If I interpret Kant correctly, he held that the cosmos cannot consistently be treated as a unified object with a determinate and discoverable set of properties. I take this position to have been refuted by the modern science of cosmology. Having said this much, I must say one more thing: if the cosmos can be consistently treated as a unified object with a determinate and discoverable set of properties, it does not in my view follow that it is an individual thing in the strict and metaphysical sense. A metaphysician might hold that the planet Jupiter was, strictly and metaphysically speaking, a mere collection of particles and also hold that this should not prevent astronomers from treating those particles as if they composed an object that had a certain diameter, a certain mass, and so on.)

If the *World* is a mere collection, it is perhaps possible that there are only contingent beings and that none of them is an independent being. Perhaps it is possible that the *World* is a collection that contains *infinitely many* individual things, and perhaps it is possible that the individual thing A depends for its existence upon the individual thing B, and that B depends upon C, and that C depends upon D, and so on forever (or that A depends upon B and C, and that B depends upon D and E, and that C depends upon D, F, and G, . . .). And if these things are possible, the present version of the cosmological argument fails.

And there is really a great deal to be said against the thesis that the *World* is an individual thing. Atheists, who tend to identify the *World* with the cosmos, often put forward a thesis about the mutual dependency of the elements of the cosmos more or less the same as the model sketched in the preceding paragraph. And those theists who believe, as almost all theists do, that God did not have to create anything, or who accept the other premise of the present version of the cosmological argument (the impossibility of an independent and contingent being), will want to reject the thesis that the *World* is an individual thing.

To see why theists will want to reject this thesis, let us suppose that the *World* is a individual thing, and let us also suppose that there are no independent and contingent beings, and let us see what consequences these suppositions have for theism. We shall call the individual thing that is the *World* ‘W’. If W is a true individual thing and a mere collection, then (given theism) it has God as a part, its other parts being the various things God has created. Now let us consider one of the possible worlds in which God chose not to create anything—Possible World Four, let us say. In Possible World Four, there exist no individual things besides God (and God's parts, if God has or could have parts). Now W is, as we have seen, an independent being. Even though God is a part of W and all the other parts of W are dependent beings (they depend upon God for their existence), it remains true that W depends upon nothing outside itself for its existence. Since there are no independent and contingent beings, it follows that W is a necessary being, and hence exists in Possible World Four. So both God and W exist in Possible World Four. But there is nothing in Possible World Four, but God and the parts (if any) that God would have in Possible World Four. It seems fairly evident that W could not be a part of God in Possible World Four, even if God could have parts. (And all theists I am aware of would deny that God could have parts. For example, the first of the Anglican Articles of Religion begins, “There is but one . . . God . . . without body, parts, or passions. . . .”) After all, in actuality God is a part of W. Therefore, in Possible World Four, W and God would be identical; that is, “they” would be one and the same individual thing. But in actuality W and God are two individual things: the Taj Mahal, to take just one example, is a part of W, but it is not a part of God. And it is impossible for *two* individual things to be such that they could have been one and the same individual thing.

If anyone is doubtful about this, let us look at the matter the other way round. Suppose, once more, that Possible World Two is the actual world. If W and God are the same individual thing in Possible World Four, then it is true of this one individual thing in Possible World Four that it could have been two individual things. God (or W) in Possible World Four could correctly speak as follows: “In Possible World Two, there are two individual things, one of which has created beings as parts and the other of which has no created beings as parts. And if Possible World Two had been the actual world, I should have been both of them. If Possible World Two had been the actual world, it would have been true of Me that I had created beings as parts, and it would *also* have been true of Me that I had *no* created beings as parts, and it manifestly impossible speech. It is not a speech that any being could make (correctly) in *any* possible world. The assumptions that have led to this contradiction (other than various theses that are integral to theism) are the two premises of the present version of the cosmological argument. The theist, therefore, will want to reject one of or both

these premises. Since, as we have seen, the atheist will also want to reject one of or both these premises, they are hardly premises we can assume to be true in the absence of some very strong argument in their favor.

We have seen that there may be arguments that lend some plausibility to the premise that there cannot be an independent and contingent being, but I should not want to classify these arguments as "very strong." And I know of no argument at all for the premise that the World is an individual thing and not a mere collection of individual things.

Can any other version of the cosmological argument help us? There are versions of the cosmological argument that do not depend even on restricted versions of the Principle of Sufficient Reason. That is, there are arguments that do not depend on the Principle but which, like the arguments we have considered and found wanting, proceed from the premise that beings of certain kinds exist (we know this because we observe these beings) to the conclusion that there is a being we do not observe, a being that has in some sense a stronger grip on existence than the beings we observe. One such is the so-called First-Cause Argument. The most famous statement of the argument is that of Saint Thomas Aquinas, which is essentially this:

The chain of causes that has produced the coming-to-be of any given being of the kind we observe in the world about us (Caesar or the sun or the Taj Mahal) cannot "go back forever." Such a chain of causes must, therefore, have a first member, an initiator. (We are to think of the members of the chain of causes as beings that are responsible for the comings-to-be of other beings and not as events that cause the comings-to-be of beings.) The initiator of a chain cannot itself have come to be, for no being can come to be unless some being is (or some beings are) responsible for its coming-to-be, and no being can be responsible for its own coming-to-be. Therefore, there exists at least one "First Cause": a being that has never come to be (that is, a being that either has always existed or else is somehow "outside time") and is an initiator of chains of causes of the kind that have produced the comings-to-be of the beings we observe.

Most of the controversy about this argument has focused on the premise that a chain of causes must have an initiator. We shall not enter into this controversy, for even if the argument proves its conclusion beyond all shadow of doubt, that conclusion is not strong enough for our purposes; its conclusion will not provide us with an answer to the question, Why should there be anything at all? The First Cause argument, if it proves anything, proves only this: that there is (or once was) at least one being that did not come into existence and is (or was) capable of causing beings to come into existence. Such a being would indeed have a stronger grip on existence than the beings present to our senses: unlike them, it would not need to be brought into existence by some other being or beings. Nevertheless if there were a being of this sort, we could still raise the question *why* there was a being of that sort. And "Because it has always existed" is not an answer to the question "Why is there a being that has always existed?" (Similarly, "Because it is outside time" is not an answer to the question "Why is there a being that is outside time?")

We have examined several versions of the cosmological argument, and have failed to find any proof of the existence of a necessary being. No conclusion can be drawn

with certainty from these failures, for there may be other versions of the cosmological argument that are not failures, that succeed in showing that there is a necessary being. At this point, I can only record my conviction that no known argument (whether it is a version of the cosmological argument or an argument of some other sort) is a successful proof of the existence of a necessary being.

One obvious explanation of our inability to find an argument for some thesis is that that thesis is false. Could it be that there is no necessary being? If there were no necessary being, it seems to me, there could be no answer to the question, Why is there anything at all? I concede that the formal logic of possibility and necessity does not rule out the following thesis: it is a necessary truth that there are beings, even though there is no necessary being. For all the formal logic of possibility and necessity can tell us, it may be that there exist beings, *some beings or other*, in every possible world, even though there is no *one* being that exists in every possible world. (If it is a merely contingent truth that there are beings, it is very hard to see what could explain this truth or how there could be any answer to the question why beings exist. If it is a merely contingent truth that beings exist, there is at least one perfectly good possible world in which there exist no beings, and it is very hard to see how there could be any explanation of the contingent truth that that world, or one of those worlds, was not the actual world. Explanations of contingent truths must, as we have seen, cite other contingent truths, and what contingent truth or truths could be cited in an explanation of beings "existing at all"? If it is a contingent truth that there are beings, then it must *just happen* that there are beings—and that must be all there is to say.) Even if there is no necessary being, it could *for all we know* still be a necessary truth that there are contingent beings.

We can, however, raise questions about the coherency of this idea. Imagine two beings, Alice and Bertram, who are the only individual things or beings in Possible World One. Suppose that in Possible World One Alice knows there are at least two other possible worlds, in one of which (Two) she alone exists and in the other of which (Three) Bertram alone exists. If these were the only three possible worlds, then it would be a necessary truth that something existed, and yet there would be no necessary being. But wouldn't it be reasonable for Alice, given what she knows in Possible World One, to conclude that there was a fourth world, a world in which neither she nor Bertram nor anything else existed? She knows she can exist without Bertram and knows that Bertram's failure to exist need not be "compensated for" by the existence of some third individual thing (Possible World Two) and knows that she need not exist at all (Possible World Three). And she knows Bertram can exist without her and knows that her failure to exist need not be compensated for by the existence of some third individual thing and knows that Bertram need not exist at all. Where then is the impossibility in the following state of affairs: Neither Alice nor Bertram nor any other being exists? Where is the impossibility in there being nothing at all? It seems reasonable to conclude that if there is no necessary being, then it may well be possible for there to be nothing at all.

We may, finally, conclude that metaphysics can provide us with no answer to the question, Why should there be anything at all? It would seem that the only way to answer this question would be to demonstrate the existence of a necessary being, and we have been unable to do this. Whether we have been unable to do this because (i) there

is no necessary being or because (ii) although there is a necessary being, there is no way of demonstrating its existence or because (iii) there is a demonstration of the existence of a necessary being that *we* have simply not got the intellectual equipment to discover, is a question the readers of this book must answer for themselves.

Before leaving this topic, I wish to examine briefly the suggestion that science can succeed—or has already succeeded—where metaphysics has failed. This suggestion has its origins in current scientific speculations about how one might explain the singularity out of which the cosmos arose. (According to the almost universally accepted cosmological model, underwritten both by astronomical observation and the general theory of relativity, there was less space in the past than there is now, and the further back one goes into the past, the less space there was; if one goes far enough back—ten or fifteen thousand million years—one finds that the totality of space dwindles toward a limit, a mathematical point: the “singularity.” The sudden emergence of the cosmos from this point is—because of the high velocities at which things were moving apart in the first moments after this emergence—known as the “Big Bang.”)

One such set of speculations employs the slogan “Nothingness is unstable,” the implication being, roughly, that it is impossible for nothingness to remain nothingness: the intrinsic nature of nothingness is such as to give rise, of necessity, to *things*. Many celebrated scientists seem to be impressed by this slogan (which I call a slogan because it is a vague phrase of ordinary English whose use is by no means dictated by the mathematically formulated speculations it is supposed to summarize). Other equally celebrated scientists are skeptical or even contemptuous. There is a certain amount of party politics here: the strongest advocates of taking these speculations seriously are usually anti-religious and see them as a way of showing that the coming-to-be of the cosmos had nothing to do with a Creator. In contrast, scientists who believe in God (for example, John Polkinghorne, who resigned his position as Professor of Mathematical Physics in Cambridge University to become an Anglican priest, the Harvard astrophysicist and historian of science, Owen Gingerich, and Alan Sandage, who is sometimes called “the father of modern astronomy”) deprecate the claims of some scientists to be able to explain why there is anything at all. Sandage, for example, says, “Science cannot answer the deepest questions. As soon as you ask why there is something instead of nothing, you have gone beyond science.”⁶ (There may well be other motives than religious and purely scientific ones behind such statements. They may be expressions of a fear that some scientists are making grandiose public statements that will bring science into disrepute or even cause it to be held up to ridicule.)

Whatever the scientists themselves may think, there are philosophers who have been impressed by the claim of some scientists to have explained (or to be about to explain) why there is something rather than nothing. Here is a quotation from a recent textbook:

Many philosophers past and present think that the question of why something exists rather than nothing is unscientific. Some have claimed that the question is meaningless because it could never, even in principle, be answered. Others have claimed that the question lies in the realm of metaphysics, forever beyond the reach of science.

Science has proven these philosophers wrong. Modern science has not ignored the question of why something exists rather than nothing. For the first

time ever, the question has a possible scientific answer based on the idea that because nothingness is necessarily unstable, the universe necessarily exists. What is there something rather than nothing? Ultimately, because something—*the universe*—necessarily exists.⁷

But what does it mean to say that “nothingness is unstable”? As we have seen, ‘nothingness’ is not the name of an object, and one would suppose that the adjective ‘unstable’ expresses a property, and, of course, only an object can have a property. There to be instability, something must be *there* to be unstable: there must be an unstable object (an object in a certain state that is liable to slip over into some other state or a plurality of objects standing in unstable relations to one another. And if there is an object of any sort—even if you call it ‘nothingness’—, there is not nothing. Curious enough, the authors of the above passage are aware of this point. A moment before they had said: “An unstable nothingness? It sounds as if ‘nothingness’ is a sort of thing a mysterious energy-free, space-free, time-free, matter-free object that just happens to be unstable. But nothingness is *not* a thing. Nothingness is just nothing.”⁸

Having recognized this difficulty, however, the authors do nothing to resolve the wording of this second passage, moreover, raises an additional difficulty. The authors recognize that if there were nothing, then there would be no such thing as passage of time. But the idea of instability is an inherently temporal idea. To say that certain state of affairs is unstable is to say that if it obtained at a given time, it would be a tendency for it to cease and be replaced by some other, incompatible state of affairs at some later time. To say that nothingness is unstable, therefore, can mean that if there were nothing at a particular time, then this state of affairs would have a tendency to cease and to be replaced by the state of affairs “there being something” at some later time. But if there being nothing is incompatible with there being such a thing as the passage of time, the idea of an unstable nothingness is meaningless for a second reason (a second reason, that is, besides the obvious reason that if there is nothing there is nothing to have the property of instability).

If this way of talking is meaningless, why are there people who engage in it? In answer, I believe, is that its meaninglessness is disguised by some confusions generated by the word ‘vacuum’. According to modern quantum field theory, objects pop into (temporary) existence in the so-called quantum vacuum. And the word ‘vacuum’ strongly suggests nothingness. But even in the seventeenth century, a vacuum was not really *nothing*, since it had various properties (spatial extension if no other and “nothing” cannot have properties. The modern quantum vacuum is *very* far from being nothing. It is simply the lowest energy state of the quantum field (the quantum vacuum is, therefore, a mere modification of the quantum field: the words ‘quantum vacuum’ are a name that is applied to the quantum field when it is in a certain state just as ‘fist’ is a name that is applied to a hand when it is in a certain state), and a quantum field is a physical object with a very complicated structure, a structure specified by a set of equations containing a variety of apparently arbitrary numbers. If quantum vacuum is “unstable” in this sense: it will not inevitably be devoid of particles. Even if the quantum field is in its lowest energy state, there is a chance particles—photons, say, or proton/anti-proton pairs—will appear in the field and transition energy to instruments designed to detect them. It is also possible (in certain circuits

stances, such as an expanding spacetime) for the vacuum state to evolve into a non-vacuum state, a state in which it would be very unlikely for there to be no particles. One *might* use the words "Nothingness is unstable" to describe either of these consequences of quantum field theory, but these words can be no more than a figure of speech. They do not describe the sober metaphysical truth of the matter. (I cannot deny the *appropriateness* of the figure, however. The quantum vacuum is not called a "vacuum" without reason, and, like the world of Narnia at its beginning, it is "really very remarkably like Nothing.") The particles that appear in the quantum field do not truly emerge from sheer emptiness, but from the quantum field, a physical object.

The speculations summed up in the slogan "Nothingness is unstable" do not contend that the cosmos arose from a local fluctuation in the quantum field. The quantum field, after all, is a part of the cosmos. (Actually, current physical theory is forced to postulate more than one quantum field, but physicists regard this as an unsatisfactory feature of current theories and are working to reduce the number of fields to one. Gravity, moreover, cannot yet be satisfactorily described as a quantum-field phenomenon, but physicists hope to be able to provide a quantum theory of gravity, and to unify the theory that describes the quantum-gravitational field with the theory that describes the others. It will be simplest for our purposes to suppose that all this has been done. It is this supposition that allows us to talk of *the* quantum field.)

These speculations proceed, rather, by attempting to describe the properties of some object *analogous* to the familiar quantum field, and they assert that the cosmos arose out of a fluctuation due to the inherent instability of that object. Well, good luck to them. The point is that even if they are successful, they will explain the existence of the cosmos only by postulating an object having certain properties and by showing how an object having those properties could give birth to an object like the cosmos. (And this is just how scientific explanation works: one explains a phenomenon in terms of the properties of something that can be described independently of that phenomenon. One explains superconductivity, for example, by appealing to physical laws that would be in operation even if there were no solid matter and showing how the working of those laws generates the phenomenon of superconductivity when matter is arranged the way it is arranged in materials that exhibit superconductivity.) And even if they are successful, one can still ask why there is such an object as *that*?

If the scientists who had managed to explain the genesis of the cosmos in the way we have imagined really had an answer to the question, Why is there anything at all? they would have to be able to show that this object was necessarily existent or at least that it was a necessary truth that there was an object of *some* sort. And how would they show *that*? They certainly have not yet done anything that looks like showing that. The current speculations about the reasons for the existence of the singularity out of which the cosmos arose come no closer to showing that the existence of something is a necessary truth than current speculations about the explanation of high-temperature superconductivity do to showing that the existence of high-temperature superconductivity is a necessary truth. Any appearance to the contrary is due to games played with the words 'nothing' and 'vacuum'.

Science has not, therefore, succeeded where metaphysics has failed. The scientists are unable to help the metaphysicians, and the metaphysicians are unable to help themselves. We have no answer to the question, Why should there be anything at all?

Suggestions for Further Reading

Burrill's *The Cosmological Arguments* is a useful collection. Chapter 11 of Taylor *Metaphysics* contains a brilliant presentation and defense of a version of the cosmological argument based on the Principle of Sufficient Reason. For discussions of the Principle of Sufficient Reason, see Leibniz, *Principles of Nature and Grace* (particularly §: Rowe, *Philosophy of Religion*, Chapter 3, and van Inwagen, *An Essay on Free Will*, p. 202–204.

For an account of the role played by the quantum field in current physics, see Polinghorne's *The Particle Play*.

Notes

1. G. W. Leibniz, with whose name the phrase "the Principle of Sufficient Reason" is primarily associated, states the Principle as follows: "now we must rise to *metaphysics*, making use of the *great principle* . . . which holds that *nothing takes place without sufficient reason*, that is say that nothing happens without its being possible for one who has enough knowledge things to give a reason sufficient to determine why it is thus and not otherwise." (*Principles of Nature and Grace, Founded on Reason*, 1714, §7). The translation is taken from *Leibniz: Philosophical Writings*, trans. and ed. by Mary Morris (London: J. M. Dent & Sons, 1934), pp. 25–2.
2. The cosmological argument is usually classified as an argument for the existence of God that is, of a unique, necessarily existent Person who is responsible for the existence of all other things. But the conclusion of the argument, at least as the argument is usually formulated, do not say either that there is one and only one necessarily existent being or that any necessary existent being is a person. Indeed, the argument is often criticized on just the point that its conclusion cannot be read as 'God exists'. But for our purposes this is no defect in the argument: there were a thousand and two necessary beings, none of which was in any sense a person, an if we knew this, we should know why there was something rather than nothing.
3. The proposition that Possible World Four is the actual world is a false proposition, but it *were* true, it *would* necessitate all the truths that *would be*—in that circumstance—truths. It only such "world propositions" (propositions asserting of a particular possible world that it the actual world) that are capable of necessitating all truths.
4. The professional metaphysician will recognize that it has been assumed in this argument that if the proposition that A and the proposition that B necessarily have the same truth-value then they are one and the same proposition. Or, at least, the argument assumes that if the proposition that A and the proposition that B necessarily have the same truth-value, and if the are contingent truths, the fact that A cannot be offered as an explanation of the fact that E. This assumption is controversial and it could be important. Suppose, for example, that God exists necessarily and is essentially omnipotent, and suppose it is possible for Him to decree the whole set of contingent truths. Then the proposition that God decrees that Possible World Two be the actual world is true in and only in Possible World Two. But it is not wholly implausible to suppose that the statement, "Because God decreed that Possible World Two be the actual world," is, if true, a proper answer to the question, "Why is Possible World Two the actual world?" (No doubt there are non-theistic analogues of this objection.) This objection is serious and deserves a lengthy reply. Here is a short reply: Suppose the case imagined is actual. What is the explanation of the fact that God decrees that Possible World Two be the actual world? Is the fact its own explanation? Is its explanation, perhaps, the further fact that God decrees that God decree that Possible World Two be the actual world? Is its explanation that God desires the actual world to have a certain intrinsic property F, together with the fact that Possible World Two alone has F? All these candidates for an explanation seem unsatisfactory. (Consider

the third. If a possible world has some intrinsic property, it is a necessary truth that it has that property. Now consider the proposition that God desires the actual world to have F. This proposition is either necessary or contingent. If it is necessary, the proposition that Possible World Two is the actual world will be necessary and Possible World Two will be the only possible world. If it is contingent, what explains its truth? The fact that God decrees that He desire that the actual world have the property F? And what other candidates are there?

5. The translucent ball and various other features of the following discussion are borrowed from the brilliant exposition of the cosmological argument in Richard Taylor's *Metaphysics*, 4th ed. (Englewood Cliffs, N.J.: Prentice Hall, 1992), pp. 99–108.

6. Quoted in an article in the *Science Times* section of the *New York Times*, 12 March 1991.

7. Daniel Kolak and Raymond Martin, *Wisdom Without Answers: A Guide to the Experience of Philosophy*, 2nd ed. (Belmont, Calif.: Wadsworth Publishing Co., 1991), pp. 79–80.

8. *Ibid.*, p. 77.

9. For some recent scientific speculations about the causal antecedents of the Big Bang, see Denis Overbye, "Before the Big Bang, There Was . . . What?" in the "Science Times" section of the *New York Times*, 22 May 2001. See also Jim Holt, "Nothing Ventured," *Harper's*, November 1994.

Part Three

THE INHABITANTS OF THE WORLD

Introduction to Part Three

The final part of this book is about *us*, the inhabitants of the World. That is, it about human beings and any other beings there may be that are sufficiently similar *us* that it would be reasonable to consider them our fellow inhabitants of the World. (While it may be reasonable to use the word 'inhabitants' in a sense in which apes and beavers and elephants—and perhaps even ants—are "our fellow inhabitants of the World," I shall use the word in the sense suggested by the adjective 'inhabited'—as the question "Is that island inhabited?") The term traditionally used to describe *us* as beings "sufficiently similar" to *us* is 'rational'. Human beings, however irrationally they may behave, and angels and Martians (if there are angels or Martians) are rational. The required sense. Apes and beavers and elephants are not rational in the required sense.¹ Non-human terrestrial animals—especially apes—may, however, be very *intelligent*. For this reason, in Part Three I avoid using the term 'intelligent' to do the work I now assign to the word 'rational'. The use of 'intelligent' to refer to mental capacities not possessed by even the brightest apes is quite common, as may be seen from such familiar phrases as 'the search for intelligent life elsewhere in the universe'. (I have myself used the word 'intelligent' in this strong sense at several points in this book. In Chapter 1, for example, I said that Kant's diagnosis of the failure of human beings to produce a science of metaphysics would apply equally to "intelligent dolphins.") In this phrase, 'intelligent' means just exactly what I will mean by 'rational': anyone who said there was intelligent life elsewhere in the universe would be taken to mean there were somewhere beings that shared with *us* mental capacities the most "intelligent" apes do not share with *us*.²

And what is rationality? Let us begin to try to answer this question by considering another question, a question asked by the philosopher Ludwig Wittgenstein: "We say that a dog is afraid his master will beat him, but not that he is afraid his master will beat him tomorrow. Why not?" The beginning of the answer to this question is that the idea expressed by the word 'tomorrow' is wholly foreign to the mental world of the dog. If the dog can be said to have ideas at all, the ideas that constitute the content of its thought at any moment are ideas of things it is then aware of or of things that