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Infinite Thinking

1

If God is real, then why are our lives so limited, so inadequate? Why is there anything except infinitely rich thinking, knowledge of absolutely everything worth knowing?

A possible reply is that nothing exists apart from the thoughts of God: infinitely many thoughts about everything worth knowing. Limited and inadequate though our lives are, they are still worth living, worth knowing about. An infinite divine mind includes full knowledge of how it feels to be living such lives, and this knowledge is the lives themselves. Their only reality lies in the fact that God is thinking them.

Imagine an infinitely complex mental life divided into regions: thoughts, that is to say, about separate groups of facts. Imagine a region filled with immensely much knowledge, all of it appreciated 'in a single glance'. In any region of this kind there could be no full knowledge of what you and I know, which includes precisely how it feels to be greatly limited and deeply ignorant. But the divine knowledge would presumably extend to that. Knowing everything in the least worth knowing, how could God be unaware of it? It could be known as more than just a possibility, for God's knowing it in all its structural detail could be its reality. As Spinoza saw, all our limitations and ignorance cannot refute the theory that you and I are tiny regions inside the divine thinking. (Could an infinite divine mind have full knowledge of how it feels to be atheistic? Why ever not? People who were elements in the divine being would not be thrown out of it through becoming atheists.)

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(1) The chapter discusses whether infinite thinking is truly possible. The thoughts of a divine mind might be infinite even if, as suggested by Cantor, no mind could know the set of all truths 'because there is no such set'. (2) Thought about any complex structure would itself possess a complex structure, and a material universe could be fully real just through possessing a complex structure of the correct kind, the law-controlled kind that physicists investigate. It would not need to be made of 'the right sort of stuff', such as 'non-mental stuff'. Having the right structure would be sufficient. Among the divine thoughts there might be ones which combined to form many very intricate groups, each group structured in a way that justified our calling it 'a universe'. The divine mind could include infinitely many such universes. (3) It would no doubt include thoughts, as well, that were not organized into universes. Yet the divine thinking, although infinitely rich, might still not extend to many truths. Among truths about possibilities, many might not be worth thinking about, for instance because the possibilities in question were as disorderly as books filled with random letters.

The suggestion that reality consists not just of one infinite mind but of infinitely many, each worth calling 'divine', is considered only in later chapters.

A Pantheistic Approach to the Problem of Evil

If theism is correct—if God is a reality—then we face the theological Problem of Evil. Assuming that God is even moderately good, why are our lives so unsatisfactory?

The book will examine the kind of pantheistic answer suggested by Spinoza (1632–77). While his works are difficult, a natural reading of them is this. He views our conscious states *as elements in the thoughts of a divine mind that includes all reality*. Agreed, they could be rather inferior elements, but their details are still worth thinking about. Now, the divine mind knows or thinks everything worth knowing or thinking.

We can investigate these pantheistic ideas without worrying much about Spinoza's complicated writings. Did he consider that what was worth knowing included absolutely all truths about logical possibilities (matters describable without actual contradiction)? Did he picture God as contemplating abstract mathematical facts of fantastic complexity, together with all possible feeble jokes, bad poems, wicked actions, and depths of misery, or would he have said instead that everything in the divine mind had to fall into a single system ruled by what scientists call laws of nature? In his view, what was the logical status of worlds obeying laws different from the laws of our world? Were they each as inconsistent as a round square or an unmarried wife? Often extremely hard to answer, such questions could be of great interest to Spinoza scholarship yet we need feel no duty to answer them.

Instead let us see whether Spinoza's two crucial suggestions—that our conscious states are simply elements in a divine mind, and that it is a mind which knows or thinks everything worth knowing or thinking—could make the Problem of Evil more manageable.

Perhaps our world strikes you as very disappointing. Maybe you can imagine some other world you would much prefer to inhabit. But God perhaps thinks of that other world as well as thinking of ours. It might actually be a world containing somebody very much like you: perhaps even a person whose early years were like yours in every detail, that person's world and our world taking on different characteristics only later. Saying *you would prefer to be this other person* can have rather an odd status. To begin with, you could hardly use it as a complaint against the actual scheme of things, if a Spinozistic approach were right, unless you thought of your own conscious life as not worth having. For if yours is a conscious life worth having, and if the fact of your having it is just the fact of God's thinking of all your various conscious states, then presumably you should be glad that God is thinking of them instead of thinking of the life of that other person much like you, in that other world, without thinking of your life *also*. Besides which, how much sense could there be in wishing you had the life of the other person? Would this be any different from wishing you had the privilege of not being *you* at all?

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Next, would you prefer to have divine thought-patterns in addition to your own so that you knew everything God knows? Would this make any sense? Perhaps not. It is hard to see how you could suddenly be given all the divine knowledge without ceasing to be you. Wouldn't sudden omniscience shatter your personal identity still more thoroughly than suddenly becoming a goldfish with its extremely limited thoughts? Essential to your being you, it might well be argued, is that your thoughts could extend only to a tiny part of what God knows. But the Spinozistic theory, remember, is that tiny elements in the divine thinking are what they are. So the Problem of Evil, if it is to have much bite, may have to depend on saying such things as that your own conscious life is simply not worth living. Now, would you go quite so far as to say that?

Trying to introduce ideas like these in the twenty-first century and in the West, and particularly to philosophers in the analytical tradition in which I was trained, one never knows where to start. The points I want to make could seem entirely natural to a traditionally educated Hindu, or to Hegelians such as F. H. Bradley, who sometimes called himself a pantheist but managed to reign supreme in Britain's philosophical world right into the early twentieth century, or to a physicist such as David Bohm, who speculated that all the parts of our universe form a collective mind of some sort; yet they can easily be dismissed as preposterous, for all kinds of powerful reasons. And it is no use thrusting a hand into the bucketful of possible objections, pulling out one of them and writing a book about it before tackling the next. Instead one has to paint a huge picture at speed, conscious that every brushstroke can earn raised eyebrows, incredulous stares, or worse. One has to do this because the elements in the picture make sense only when seen as a whole. From which it follows, unfortunately, that whatever one begins with can look outlandish.

The book's chapters are prefaced by chapter summaries. A thing to notice is that many of the themes mentioned in them are ones that feature in the writings of scientists. In particular:

Chapter 2, 'Minds Human, Artificial, and Divine', discusses the dramatic degree of unification that Spinoza attributes to our world.

Well, it is something that *quantum physicists* often say they have found in it. Again, Spinoza's pantheistic idea that the reality of everything is a matter of consciousness (for at least as I interpret him, he views the world in all its intricacy as nothing but intricate divine thought, divine consciousness) by no means forces him to believe that trees and rocks are conscious beings, and is actually something towards which quantum physics is fairly friendly. Many physical systems, quantum theorists have discovered, possess what Descartes viewed as the exclusively mental property of being more than just the sum of many separately existing parts. Even to predict the probable whereabouts of two photons in the same quantum state, you may need to appreciate that their identities are partially fused. While the chapter rejects the Cartesian idea of an immaterial soul, it points out that *quantum computers*—the principles governing them have already been demonstrated in laboratories—would work in ways that couldn't readily be imitated by any collection of cogwheels or transistors, or of atoms as conceived by nineteenth-century physics. They are ways in which brains, too, may operate.

Chapter 3, 'Time and Immortality', argues for an Einsteinian approach to the nature of time. Such an approach encourages the theory that divine thoughts about our world's events, and hence also these events themselves if (as pantheism suggests) their highly complex patterns are only patterns of divine thinking, *are all in some acceptable sense 'eternal'*; the world being 'unchanging' in a sense corresponding to this. This would not be denying that trains move and that children grow taller over the years.

Chapter 4, 'The Best and Infinity', insists that pantheism doesn't tell us we are powerless to influence the world's events. Instead of just waiting to see what the future will bring we can set out to make the world better, because all the causal patterns recognized by scientists can be found inside pantheism's cosmos. They are patterns which you and I can influence because our choices and actions *form part of them*. Scientists and philosophers have long held that this point is unaffected by whether physical laws govern the details of those choices and actions.

Chapter 5, 'Necessary Divine Existence', defends a Platonic creation story. It might at first seem one which scientists ought to reject.

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Setting out to answer ‘why there actually is Something, not Nothing’, it appeals to *the ethical requiredness of there being Something*. Yet when you examine the matter closely you may well join the many scientists who think that the sheer fact of there being a cosmos—any reality whose laws science could investigate—isn’t itself an affair that science can answer. Again, the apparent *fine tuning of our universe* might best be explained Platonically. Physicists and cosmologists talk of ‘fine tuning’ because many matters basic to the structure of the physical world, for instance the strengths of physical forces like electromagnetism and gravity, appear such that tiny changes in them would have prevented life’s evolution.

All the same, theism looks quaint and outdated to many people today, while pantheism strikes many of them (and many theists also) as quite extravagantly bizarre. And if I saw no force in the Platonic explanation of why there actually is Something, something other than mere facts about possibilities, then—though some highly intelligent people could disagree with this reaction of mine—theism in general would seem odd to me as well, and I’d not rush to defend pantheism. As things stand, my confidence in the Platonic explanation is only a little above 50 per cent. It seems to me really quite likely that the world exists for no reason whatever. It could very well be that not even an existent of a supremely good type, a divine mind knowing everything worth knowing, existed *because of its ethical requiredness*. The mere sense of the words ‘ethically required’ cannot show that any ethical requirement, even the very strongest, will have any tendency to put itself into effect in the fashion that Plato envisaged when he wrote that the Form of the Good is what gives existence to things. Still, this Platonic theory is not grounded on any mistake in logic. It has come to be viewed by various very competent thinkers—they include leading philosophers in the analytical tradition of Britain, North America, and Australasia, and theologians of the kind who believe in supporting their faith with detailed arguments—as something which might actually be right. Yet surely it couldn’t be right if the Problem of Evil couldn’t be solved, and I cannot myself see how anything but pantheism would solve it. So the situation takes the following uncomfortable

form, I suggest. Because you were unfamiliar with the Platonic explanation for the world's existence, the pantheistic world-picture of this book's first four chapters might well seem to you fantastic. In that case, maybe you ought to begin by reading Chapter 5. But what if you did? The Platonic explanation could then itself strike you as fantastic because you couldn't see how the Problem of Evil could be solved, and I'd wish you had instead begun with Chapters 1 to 4. There is just no escaping the fact that whatever one starts with can appear absurd.

As good a way as any of starting might be this, however. Let us ask what any Spinozistic pantheism could mean by *divine thought or knowledge*.

Divine Knowledge is Eternal Thinking, of Immense Complexity

Somebody can think something without knowing it, since people are often wrong. Again, one can know something without thinking about it. You knew all through the last five minutes that you weren't a purple cactus on Mars, didn't you? 'Thought', 'knowledge', and 'consciousness' are separate notions, and so is 'mind'. Our minds are not just collections of thoughts. They are what have our thoughts, before which they need to go through the process of generating them.

The case of divine thinking is supposedly very different. Here, thought and consciousness and knowledge and mind are rolled into one. Instead of struggling to generate its immensely many thoughts, the divine mind is in eternal possession of every one of them. They are all items of knowledge, and the knowledge is all of it fully conscious (unlike your earlier knowledge of not being the cactus). Also, the mind that has the divine thoughts can be merely the thoughts themselves, forming a unified whole: a whole in which they are united in their very existence despite there being infinitely many of them. This could be strongly linked to the fact that all of them are elements in the divine consciousness, because consciousness might be the only thing that can 'hold a many in one, a diversity within a unity', as Bradley expressed it.

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A great deal of this is both controversial and obscure. For the moment, please just remember that the divine mind is being pictured as no ordinary mind in many respects, quite apart from the fact that it knows infinitely much.

Structures in the Divine Mind can be the Structures of Real Things such as Humans

On my Spinozistic or pantheistic theory, the structures of galaxies, planets, and continents, of mice and of elephants, and of you and me, as well as of the houses, fields, and streams with which we interact, are nothing but the structures of various thoughts in the divine mind. The divine mind does not contemplate any universe that exists outside it. Its thinking about our universe is what our universe *is*. When God contemplates various physical possibilities in full detail they do not remain 'merely possible' like the golden mountains of our dreams. They are genuinely real, existent, actualized, non-fictitious.

How, after all, do physicists describe material objects? Not with such useless phrases as 'good, solid stuff', but by trying to specify their intricate structures. In the divine mind those structures, including the structures which are the physicists and their laboratory equipment, are present in their entirety. If you consider this far from sufficient to make them into the structures of real stars, animals, pastures, atoms, electron microscopes, and scientists, then perhaps that simply shows how unsympathetic you are towards a Spinozistic world-view. For if, coming to accept such a world-view, you still protested that objects would be in need of far more in order to qualify as 'real', then you would have to declare that you yourself had no reality, which would be absurd.

You ought surely instead to continue counting yourself not only as real, but as a real material thing. Suppose we lived in a universe which a deity had created outside himself. It might then be appropriate to say that any structures in the deity's mind when it contemplated the things of that universe were 'mere models of those things, not real material things like us'. The Spinozistic theory, however, is that nothing exists apart from divine thinking, you and I being structures inside it. Now, it

would cause endless confusion if those who accepted this theory went around declaring that they or other people were ‘mere models and not real people’ or that the material of the trees they had apparently bumped into ‘wasn’t really there’. Yes, when we humans imagine trees in great detail it would be asinine to claim that our minds thereby come to contain real trees. But the divine mind as a modern Spinozist conceived it would think of *absolutely all* the intricate structure of trees as described by a completely accurate physics. And the Spinozist would believe that, if granted a miraculously reliable vision of reality, then he or she, seeking elements whose structure was more or less as described by the best physics of the day, would find them in a divine mind whose structure was in whole or in part the structure of our universe, *and would find them nowhere else*. The Real would contain no other candidates for the description ‘the material objects of our universe’, and this point shouldn’t simply be disregarded.

If you none the less want to say that Spinozistic pantheism ‘makes the material world an illusion’ because the material world as pictured by you and by most people, at least in the West, is something quite other than divine thinking, then so be it; use language as you please. But don’t ask all Spinozists to define words exactly as you do, thereby forcing them to go around declaring that physical objects are illusory! The rules even of ordinary language are far from dictatorial when it comes to such matters as why, if at all, intricately structured material things couldn’t be parts of intricately structured divine thought or consciousness—for since when have folk in the street been unable to communicate with one another without adopting firm views about what protons and electrons are made of, and how if at all they would differ from every element that a divine mind could contain?

Thought about Complex Structures Must itself be Complexly Structured, even when Divine

In science fiction you sometimes come across the idea that you are being deceived by a mad scientist’s gigantic computer. Your friends have never really existed. There are only *simulations* which the computer is running

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so as to give you the illusion of interacting with other people in a world of good, solid stuff. You are a brain kept alive in a vat of nutrients and wired up to the computer.¹ A typical suggestion is that it would then be quite all right, say, to interact with the computer in the way that (if your brain is male and vicious) you had always thought of as *tormenting your wife*. No harm would be caused! She wouldn't be a real person, would she? Well, perhaps she would be. To have succeeded in deceiving you, the mad scientist's computer would presumably have needed to simulate people in immense structural detail. It is hard to see how the job could be done without the computer simulating everything right down to individual atoms—simulating them for itself, that is to say, so as to be able to generate data capable of deceiving you for years on end. The computer would, I think, have needed to build up inside itself a model containing elements corresponding to atoms, a model whose structure developed just as if those elements were indeed atoms interacting with one another. Regardless of whether the apparent wife should be called 'a genuine wife', it then becomes doubtful that no misery would be being given to a real person, a centre of thought and consciousness. Couldn't even a computer simulation have a consciousness of its own if its structure were intricate enough?

Possibly it would lack consciousness. Having the right kind of intricacy may not be enough to make a conscious being. Perhaps there has to be something further, namely, having states in which hugely many elements are united in their existence: states of a kind that some people think could never be present inside any computer, while others suggest that quantum computers might some day come to contain them. Whether the apparent wife was a conscious person might depend on something more than the degree of complexity of the computer simulations. It might depend on what kind of computer (a quantum computer, or just one made up of items like transistors interacting in the ordinary way) the mad scientist used.

Suppose, now, that you were tempted to dismiss any divine mind's thoughts about humans as 'mere simulations, not genuine humans'.

¹ The brain-in-a-vat scenario is discussed in Leslie 1989*d*. This argues that brains in vats could have complex thoughts, learn languages, and enjoy very full lives.

What could be your grounds? Would you consider the divine mind too limited to contemplate all the structural details that humans have? Or would you say that elements inside any such mind could never be unified, united in their existence, in the style in which the elements of human conscious states are unified? Either way, your grounds could be considered very weak. But alternatively, would you think a divine mind capable of contemplating complex things *without itself containing any complexity*? I have been taking it for granted that it is impossible for anything to be thought about in great structural detail without there being an equivalent richness of structure in the mind doing the thinking. People sometimes deny this, however.

I believe nothing quite so silly as that, whenever a man thinks of his house, his brain must contain a tiny three-dimensional house. I instead assume that people's thoughts about houses are seldom very detailed. I also assume that, even when a brain thinks of a three-dimensional structure in great detail, the correspondence between this structure and any pattern of nerve-cell firings (or whatever) inside that brain must be in many respects unlike the correspondence between a doll's house and a full-sized house. It could be rather more like the correspondence between a map and a countryside, or between the sounds of a symphony and the laser-readable marks on a compact disc. In terms of structure, however, it could still be a good correspondence.

What is meant by 'structure' here? You could start by asking mathematicians. Mathematics can give precision to the idea, for instance, that various surfaces of different shapes and sizes share the following structural characteristic: all of them are surfaces of rectangular blocks in Euclidean space. Again, mathematics can specify speedily and unambiguously an important respect in which successive electrical impulses entering a loudspeaker are structurally similar to successive soundwaves coming out of it. To specify this you wouldn't have to wait for any explanation of how the loudspeaker functioned—although you could of course need to give one if you wanted to convince people that the structural similarity as specified did deserve to be called 'important'. If in search, however, of something nearer to the case of a human mind thinking about

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this or that, then why not consult experts on artificial intelligence? Ask how their computers manage to model such things as the positions of kings, knights, and pawns during games of chess. Don't expect them to tell you that the computers keep track of various complicated situations on chessboards without 'containing models of them, elements forming similar structures', in any useful sense! Elements inside a computer can form models of chessboards and chessmen without being made of wood or plastic. A structure consisting of items arranged intricately in space can even be represented by one whose elements are ordered in time without ceasing to be *well modelled*: duplicated, that is to say, with respect to structural features that are important here. And parts of a perceived scene could be modelled inside a brain as being close together in space despite how neuronal activities corresponding to those parts were split between the cerebral hemispheres.

What if you consult theologians, though, or philosophers of religion? It turns out that many of them oppose the idea that God's mind, thinking about this or that intricately structured situation, has itself to be structured intricately. Aquinas is a prime example. True enough, you can find Aquinas saying that God 'sees things other than himself' by exploiting the fact that 'his essence contains the likenesses of other things': it 'takes up the form proper to plant', for instance, when God cognizes the fact that there can be the sort of life that plants have. God knows absolutely all other things just by knowing himself because he contains the likenesses of them all. Yet assertions like these, suggesting a divine mind of immense structural complexity, are combined with insistence that God does not understand things 'by composing and dividing'. He is Pure Being, which means he is not characterized by any complexity or by anything we would recognize as qualities. God's creative power, God's freedom, God's justice, God's mercy, God's goodness, God's knowledge, are all of them strictly identical with one another and with God's act of existence. To the amazement of many philosophers of today, Aquinas went so far as to believe that humans are loved by God without God himself standing to humans in the real relationship of loving them. The idea appears to be that, just as Mr Black could get to be

less tall than Mr White while Mr White remained unaltered, the change being due entirely to shrinkage on the part of Mr Black, so a human could get to be loved by God without God himself being any different from how he would have been, had he decided never to create that human.

Ideas like this are by no means peculiar to Aquinas. They are defended by many Christian theologians and philosophers today, both Catholic and Protestant, and are found in contemporary Shi'ite thought as well. Aquinas never claimed to be able to make any clear sense of them, however. He ascribed this to how God was so incomparably great, so different from anything the divine power had created, yet it could instead simply be that they amount to nothing sensible. The theory of Spinozists like myself is rather different. We suggest that the elements in the divine mind are all so closely united that, like the mass, the shape, and the colour of a lump of cheese, they do not exist each in isolation from the others. While this may be a difficult theory, it is nowhere near as hard to understand as Aquinas's view that the divine mind doesn't truly have elements of any kind since it is totally lacking in structure. The right analogy for that could be a lump of cheese whose colour was identical to its shape.

In effect, Aquinas's position could be on a par with the Hypothesis of the Pure Ego which, until the early twentieth century, was admired for its alleged ability to explain how somebody could remain the very same person from one year to the next. As C. D. Broad expressed it, 'There is a single Pure Ego which lasts without qualitative change throughout my life and owns all my successive states' (1925: 279). The notion was that an ever-altering mental life could all of it be 'possessed' by something that could appreciate the alterations without itself altering. This remarkable entity could continually become aware of new mental states so that it could be, for example, sad at noon and happy at midnight, *without ever becoming any different* ('no qualitative change', remember). To me, that looks as flat a contradiction as you can get. Now even if, thanks to his doctrine that God is outside time, Aquinas avoided landing in this particular contradiction, he could seem to have ended up in one every bit as great when he taught that God's existence would necessarily be exactly the same no matter what

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went on in the world he had created (or even if he had chosen not to create it).

Aquinas could hardly have been more mistaken, I suspect. Instead of having supreme simplicity, in the sense of lacking all structure, all ordering of elements each at least partially differentiated from every other, a divine mind would carry an immensely complex pattern with innumerable elements. Still unconvinced? If so, then it is hard to see how the matter could ever be proved to your satisfaction. For some interesting and expert discussion, though, you could go to the writings of Alvin Plantinga, Keith Ward, W. L. Craig and W. P. Alston.² These contain helpful references to various pages of Aquinas, his admirers, and his critics.

The points I have just been making are not intended as an attack on the competing theory suggested by other pages of Aquinas, the Platonic or Neoplatonic theory that 'God' is the name not of any being but of a creative force whose power is inseparable from its goodness, a force in no need of guidance from any complexly structured mind. Aquinas is an undeniably great philosopher and this competing theory is far from nonsensical, as Chapter 5 will discuss. (He frequently insists that talk of *God is only analogical*. This can suggest that he viewed the competing theory as really no different from the theory I have been challenging, the theory that God could think about things with a mind that had no structure whatever.)

² Plantinga 1980; Ward 1996*a*: esp. 211–14, 229–30; and Craig 1999, all treat Aquinas's position as incoherent. Alston 1986, however, comes close to it, speaking (pp. 297–9) of 'immediate awareness' as being 'a direct and foolproof way of mirroring the reality to be known', but one in which the mirroring involves no 'mental maps' or 'inner representations' since here the state of knowledge 'is constituted by the presence of the thing known'. Yet even when such awareness is attributed to God, not humans, it is hard to see how Alston's position can be much different from the Pure Ego theory. How could any mind come to know the complex structure of anything *without itself taking on an equivalent complexity*? And what would taking on the complexity be, if not a case of forming some kind of *inner representation*? (It is no use arguing that an inner representation couldn't be of any help because it itself could be known only with the help of some further inner representation, and this in turn through the aid of another, and so on, in an infinite regress. You might almost as well argue that robots that form inner representations of their surroundings—as many of them now do, to help them to operate usefully—must have infinite regresses in their interiors.)

Up to Infinitely Many Universes Exist in the Divine Mind, Together with Many Things Not Organized into Universes

If the divine mind did have a complex structure, and one with as many elements as there were items in the divine knowledge, then how extensive would the structure be? The traditional doctrine is that the divine mind would know infinitely much. In *The City of God* (12. 18) Augustine writes that people who affirm ‘that God cannot know things infinite’ might just as well ‘leap right into the pit of impiety by declaring that God’s knowledge of numbers is limited’. He pictures God as eternally thinking not only of all possible numbers, but of absolutely all truths. Only wretches would dare to set limits to what God knows.

Two ideas are at work in Augustine’s thought: first, that God’s unchanging knowledge is infinite, and next that God knows absolutely everything. The second idea goes far beyond the first, at least if you accept such commonplace mathematical claims as that *the whole numbers are infinitely numerous* so that any mind knowing all of them ‘would know infinitely much’ (in some fully acceptable sense) even if largely ignorant about everything else. Suppose that God’s eternal, unvarying mind contemplated nothing apart from how the ultimate constituents of various universes were ordered in space and in time. While perhaps then knowing infinitely much (for some of those universes might be infinitely large, or there might be infinitely many of them) God would none the less remain ignorant of all sorts of affairs—of hugely many mathematical facts, for example; of hugely many silly thoughts which might be had; of hugely many possible ways of causing torment. The divine knowledge would not extend to such matters even in the sense of being able to give answers if asked (much as you could have answered had anyone inquired whether you were a cactus). An eternal, unvarying divine mind isn’t the sort of mind that could suddenly answer queries which it hadn’t yet contemplated.

Let us defer considering whether the divine mind is aware of absolutely all truths about actual or possible situations. For the

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moment let us just imagine that among the things it contemplates is the entire structure of *a second possible universe* much like the possible universe in which you and I find ourselves. (Our actually existing universe is a possible universe. All actual things are possible ones *as well*.) Now if my earlier arguments were correct, what ought we to say about the divine mind's contemplation of the entire structure of this second possible universe? Might it be a case of knowing a structure which remains that of a merely possible universe, one having no actual existence? Not so, I suggested. A material universe, my suggestion ran, doesn't need to be composed of any particular variety of stuff, such as 'non-mental stuff'. All it needs is a structure of the sort physicists investigate. Well, my hypothesis is that the divine mind contemplates absolutely all the structure of the possible universe in question. And if my arguments have been on the right lines, then its contemplation of this structure would necessarily involve its having such a structure itself, either as a whole or else in some region of its being, because no mind, divine or otherwise, can think about a structure in its completeness without itself being equivalently structured either in part or as a whole. Doesn't it then follow that the divine mind would contain this second universe as one which, although 'made out of mental stuff', was still an actual material universe?

You might at this point protest that divine thoughts about the order of our own universe's constituents, if they could somehow be placed side by side with the constituents themselves 'which are obviously something different', would be found to be 'structured similarly' only in a sense somewhat like the one in which a symphony and various marks on a compact disc can be structured similarly. The parallelism, you might hold, could never be absolutely perfect, no matter what tricks omnipotence used in an attempt to make it perfect. And while some people could perhaps still want to say that when thinking about our universe the divine mind could produce so close a parallelism that it could be said to contain 'a material universe made out of mental stuff' although our material universe itself *wasn't* made out of mental stuff, might you not feel inclined to forbid this way of talking? Might you not demand that no universe made out of mental stuff should ever

be called 'material' by anybody? 'It would actually be better', you could be tempted to insist, 'to maintain *that no material universe existed anywhere* than to let the words "*material universe made out of mental stuff*" pass our lips.'

Spinozists like me would ask you to resist the temptation. We maintain that even the universe that you and I inhabit is made out of mental stuff, the stuff of the divine mind, and that its structure is of the sort investigated by physicists which makes it a material universe.

What, after all, could we know about the ultimate stuff of our material universe and how its elements are related to one another, and about the ultimate nature of any divine thought or consciousness that there might be, and how *its* elements would be related to one another, which could assure us that nothing worth the name of a material object could be composed of elements that were elements of divine thought or consciousness? Until fairly recently almost all philosophers felt they knew that human minds couldn't conceivably be ingredients of the physical world 'because they had quite the wrong properties for this'. It would seem a curious failure to learn from past errors if, almost all of them having convinced themselves that this was mistaken, the descendants of these philosophers then proclaimed that material objects couldn't conceivably be ingredients of a world of divine thought 'because they would have quite the wrong properties'. For exactly why would the properties be wrong, please? Material objects, for instance trees and rocks, might exist inside pantheism's divine mind *without themselves being conscious, thinking things*. Compare Thomas Nagel's treatment of panpsychism, which he defines as the view that 'the basic physical constituents of the universe have mental properties, whether or not they are parts of living organisms'. Although finding panpsychism difficult to accept, Nagel writes that it 'appears to follow from a few simple premises, each of which is more plausible than its denial'. The premises are (1) that we are composed of matter that had a largely inanimate history; (2) that mental states like thought and feeling are neither physical properties of organisms nor implied by physical properties alone; (3) that they nevertheless are properties which we have as physical organisms, because we lack immaterial souls; and

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(4) that all intrinsic properties of complex systems derive from the properties of their components. But while these apparently reasonable premises can result in panpsychism, they *do not*, Nagel rightly insists, 'entail panpsychism in the more familiar sense, according to which trees and flowers, and perhaps even rocks, lakes and blood cells have consciousness of a kind' (1979: ch. 13, 'Panpsychism'). Viewing everything as having mental qualities, or even as being 'entirely made out of mental stuff' (such as the stuff of the divine mind), does not mean you should start wondering whether it is cruel to crush a pebble or boil a potato. Developing his version of pantheism, Peter Forrest takes care to explain that he is suggesting 'not that all things have the property of being conscious but rather that all things have the property of there being consciousness of them' (1996: 203).

Pantheists can well believe that the divine mind carries, in addition to the structure of our universe, an immense amount of further structure. If it does carry it, then no doubt some of this further structure could be described as complex thoughts about all the things in this universe. There might be such divine thoughts as the following: that it is a universe of more than thirty trillion intelligent living beings. Or again: that if one wanted two examples of unusually unpleasant humans, Stalin and Genghis Khan would do nicely. Or (for who are we, as Augustine asks, to set limits to God's knowledge?) conceivably even this one: that the greatest number of ants ever trodden on by a dinosaur during a period of 5.46 minutes was 3,479,992, the fifth smallest of the ants weighing approximately 0.041 grams. But the fact would remain that besides containing such thoughts, each of them itself fairly complexly structured, the divine mind would include all of the immensely complex structure of our universe. At least as I am developing it, pantheism is the theory that being real inside that mind is the only reality that our universe has.

Pantheists of today can next find it natural to think that the divine mind carries the structure not just of the universe we inhabit, but of infinitely many others as well. Why should any pantheist imagine that God contemplates only a single universe when today's journals of theoretical physics and cosmology are filled with articles taking it almost

for granted that universes exist in infinite number? As I explained in *Universes*,³ people typically have two chief reasons for believing in universes beyond our own. The first is that, after dreaming up mechanisms which might operate at the coming into existence of our universe, they are reluctant to believe that such mechanisms operated on only a single occasion. The second is this. Suppose there existed hugely many universes and that they differed widely in ways for which technical explanations can be suggested. (Varying scalar fields, for example, could split apart the forces of nature in different ways in different universes.) The existence of these many and varied universes would solve a major puzzle. It would become unsurprising that there existed at least one universe, ours, in which everything was 'fine tuned' in a fashion encouraging the evolution of intelligent life. Well, Chapter 6 will say more about these two reasons, which can look very forceful; but whether or not they are, pantheists can add a third reason to them. It is that the divine mind, knowing all that was worth knowing, would surely know the intricate, beautiful structures of innumerable universes.

How Ignorance and Change can Exist Inside a Mind Vastly Knowledgeable and Eternal

While the divine mind would contemplate universes in all their details, you and I are ignorant of almost every detail even of our own planet. The Spinozistic suggestion is that we can be elements in the divine thoughts without ourselves experiencing anything like those thoughts in their infinite completeness.

Forrest is a practitioner of modern analytical philosophy who accepts this suggestion. 'Our minds', he writes,

are distinct from the divine mind just because our minds are integrated sub-systems of the totality of things. But this distinction is the difference of the part from the whole, not the difference between two non-overlapping things. That is because our minds are parts of the content of the divine mind. The

³ Leslie 1989*a*. Among several other items listed in the Bibliography, note particularly the edited volume of 1990, *Physical Cosmology and Philosophy* (reappearing in 1998, expanded, as *Modern Cosmology and Philosophy*).

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divine awareness of the things you and I are aware of is numerically, not just qualitatively, identical to your or my awareness. (1996: 202)

His, he adds, is a theory 'in which God literally shares our joys and sorrows'. Because these joys and sorrows are one and the same as some of the divine mind's own experiences, just as Bonaparte was one and the same as Napoleon, there is no question of God's being ignorant of how these joys and sorrows feel to us.

Many theologians react strangely to any position like Forrest's. They deny that we could be parts of God's own reality, subsystems of thought having their own well integrated distinctness from the rest of that reality, and yet they claim that the divine knowledge extends to precisely how it feels to experience human sorrow, being confused, being in terror, and such things as the thrill of murdering a man for his wallet. Listen, for instance, to Oxford's Regius Professor of Divinity, Keith Ward, as he discusses God's awareness of a torturer's joy at torturing. God's experience of the torturer's feelings, he writes, 'would not be the experience as the torturer has it', but at the same time God knows (or at least, instead of saying with A. N. Whitehead that such feelings *are included in* God it is 'probably better to say' that God knows) 'exactly what it is like to have them', although in a manner 'wholly unparalleled in human knowledge' (Ward 1996*a*: 251, quoting Whitehead 1938: 350). This can certainly look like trying to believe the impossible. In any region of the divine being that was flooded with love, how could there be knowledge of precisely how it felt to be Stalin or Genghis Khan? And how about complete awareness of what it is like to be utterly terrified? How could this be fully fused with consciousness of being God, with nothing to fear? How, again, could a mind know just how it felt to be deeply ignorant when all of it was vibrant with awareness of knowing everything worth knowing? The next chapter will return to this area but what we ought to conclude could seem plain. Can a divine mind have experiences with a flavour exactly like that of our own experiences? Yes, but only if, inside its richly structured thoughts, some well individuated subsystems *are in fact our experiences*. Our mental processes are, I think, brain processes, and the divine mind, knowing everything worth knowing, knows all

about brains at the level of their constituent quarks, leptons, or yet tinier components. Still, it is not at that level alone that it knows brains. It must also know our brain states in the largely ignorant ways in which we know them, for otherwise it could not know *exactly how it feels to us* to be in this or that mental state. It must know what is going on in our brains in the way that we ourselves ordinarily know it—and we certainly do not know all about the quarks and the leptons, or even about individual nerve cells. For reasons on which quantum theory may shed light, we can sometimes grasp as fully unified wholes various complicated cerebral realities, but this isn't to say we know all about trillions of quarks.

How about *our experience of time's passage*? I hold with Timothy Sprigge—who has kept Spinozistic ideas alive in Scotland just as Forrest has in Australia—not only that our world consists 'of innumerable finite centres of experience', centres all of them united in a consciousness cosmic or divine, but also that there is a sense in which the experiences enjoyed by these centres 'are all just eternally there'.⁴ How can this avoid being nonsense? How can the theory that all experiences are ultimately parts of an unvarying divine mind be reconciled with the plain fact that our experiences are constantly altering? (Given that he is about to tell us that God and the cosmos are one and the same, God having all things inside himself, what can Spinoza mean by writing in the opening chapter of his *Short Treatise on God, Man, and His Well-Being* that because of being perfect God 'cannot change into anything better' and must therefore be 'immutable'?) Chapter 3 will discuss the matter at some length. For the moment, let me quickly answer that the world, even if all of it is 'eternally there', might still include realities worth the names of 'time' and 'change' *if those words were given appropriate senses*.

They would not be the sole respectable senses. A situation that is eternally there can be thought of as unvarying against a background of possible changes and therefore as being 'frozen in time', 'without any change', on one viable understanding of the words 'time' and

⁴ Sprigge 1997: 202–3. After distinguishing his own carefully described position from others that also use this name, Sprigge calls it 'pantheism'.

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'change'; however, a second interpretation of the words could be equally viable. Which interpretation you selected could be simply a matter of preference. What we need here, I suggest, is the moral Albert Einstein drew from his relativistic formulas: that we should be thinking in terms of 'a four-dimensional existence instead of, as hitherto, the evolution of a three-dimensional existence' (Einstein 1962: appendix 5, p. 150). But once having accepted Einstein's idea, how are we to *talk about* the world? Can we recognize any realities reasonably describable as 'replacement of some situations by others' and 'the passage of the years'? Certainly, yet only so long as we take this to mean merely that different cross-sections of our four-dimensionally existing world do differ in their characteristics. People of the eighteenth century are absent from the twenty-first, but in a way strongly analogous to that in which people in Toronto are absent from Vancouver. Acorns do develop into oaks but only in much the manner of a road starting off narrow in Berlin and developing into something broad before reaching Paris. Sure enough, we experience changes in our successive states of mind—yet not changes of quite the kind typically imagined by the man in the street, because no situation ever gains existence absolutely and then loses it absolutely. So if we instead choose to define 'time' and 'change' as involving existence absolutely gained and later absolutely lost, then Einstein's world is timeless and changeless. There is nothing wrong in choosing to define 'time' and 'change' in that other fashion.

The key to understanding this area is that Einstein's beliefs are in fairly clear conflict with common sense. Accepting Einstein's worldview, we cannot keep everything that the man in the street will tend to see as implied by talk of time and of change. We have to throw something out while keeping the rest. Just what we are to throw out is an arbitrary affair, so that no one way of talking about the area is 'right' in a manner that makes the contrasting way 'wrong'.

According to the Einsteinian position—popular among philosophers thanks in particular to the writings of J. J. C. Smart and Adolf Grünbaum—'now' is best treated as a word behaving like 'here'. What is *here* for me can be *over there* for you, and what is now (or 'in the present') for us can be in the future for those who are (relative to us) dead,

but who have their own *nows*. While Einstein had interestingly strong grounds for accepting this, it seems to me impossible to prove it; but disproving it is equally impossible. No simple appeal to everyday experience can do the trick because Einstein is not denying that we engage in constant struggles, often in radical ignorance of what the next moment will bring. The heard thunder of a train, the felt gust of its passing, the dizzying sights and movements of a switchback ride, the feeling of being confined to the present and able to peer beyond it only through the dusty lenses of memory and prediction, can all of them be there in the Einsteinian picture, because *What patterns do experiences bear at particular dates?* must not be confused with the philosophical question, *Is existence transferred from each pattern to the next, or are presentness, pastness and futurity only relative?*⁵

Problems with Divine Knowledge of Absolutely Everything

We now come to what can well seem a very major problem. Is knowledge of all truths possible, and if so, would it be desirable? Were it both possible and desirable, then we might have to abandon pantheism of my kind because it might tell us to reject inductive reasoning. It might, in other words, instruct us to expect our experiences to become disorderly at any moment. Rational people could never form any such expectation. Yet we could be forced to form it when pantheistic ideas became combined with the theory that God, contemplating all that is worth contemplating, knows the structures not just of all orderly worlds, but also of all possible scenes of disorder.

As already mentioned, pantheists of today can very naturally believe that the divine knowledge extends not simply to our universe but to hugely many other universes as well. Now, imagine that God has full knowledge of the structures of all possible universes that obey anything worth the name of causal laws, universes characterized by

⁵ I am quoting from Leslie 1979: ch. 9, which discusses time. For Smart's views, perhaps see Smart 1967 or 1989: ch. 2; for Grünbaum's, perhaps Grünbaum 1967 or 1973.

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regularities such as scientists investigate, so that all these universes actually exist inside the divine mind, exactly as ours does. This raises no obvious problem for trust in induction, that is, for confidence that the future will resemble the past in ways we could hope to understand and to exploit. Inductive reasoning will be a useful guide in a very large range of causal-law-obeying universes, so why not in ours? Yet what if we next suppose that, because the divine knowledge covers *absolutely everything*, God further knows all about hugely many universes that do not obey causal laws, universes as disorderly as you could dream of? Once we grant that the divine knowledge extends to absolutely all truths, and therefore to all the details of all possible universes, how can we deny that it extends to the disorderly universes as well? But now comes the difficulty for pantheists like me. Mustn't God also know all the details of universes which start off *orderly and then become disorderly*? But if so, then why should we imagine that our own universe is not of this variety?

Remember, my Spinozistic theory is that, whenever God contemplates a possible universe in all its details, then an immensely complex structure has to be present in God's mind. The fact that the structure is 'made of mental stuff' is no adequate ground for calling it unreal. Our universe is just a structure in the divine understanding, and so are all other universes that there may be. Well, our universe appears to have developed in orderly ways up to date. But if God contemplates all possible universes in all their details, and if all of them are therefore fully real universes, ones which do indeed exist, then it would seem to follow that there exist hugely many universes which, after developing exactly as ours has done until the present moment, are due to become disorderly at the very next moment. Now, why fancy that we aren't in one of those universes?

David Lewis faces the same problem when defending his well-known *modal realism*. This is the philosophical theory that each and every possible world is really existent—the term 'world' meaning not an inhabited planet but an entire connected scheme of things. Not all of the worlds are what Lewis calls 'actual' but this is because he asks each intelligent living being to apply the term 'actual' only to the world which he, she or it inhabits. Compare how 'here' is a term applied only

to what is local. Saying that various things are *here* doesn't deny that many others exist *elsewhere*: in the next house, for instance, instead of in this one. Similarly, when he says that our universe *is actual* while other possible universes *are not actual*, Lewis is merely recognizing that the other universes aren't where we exist. In his opinion all of them exist somewhere. All are actual to any intelligent living beings that inhabit them.

Lewis would therefore need to believe in everything in which I believed, just so long as my beliefs extended to nothing that was utterly impossible. If a divine mind knowing everything worth knowing is a possible mind, then Lewis ought to believe in it. On his theory the Greek gods must themselves exist somewhere, assuming (and why not?) that they are at least logical possibilities. 'I am perhaps the most extreme polytheist going', he writes, explaining that he does not consider that a being has to 'satisfy some inconsistent description to be a god'. He accepts endlessly many gods despite picturing our own universe as 'entirely godless' (Lewis 1983: p. xi). Now, the divine mind of my pantheism could be judged no more impossible than his Greek and other deities. The result is that, even granted that he believes in universes that aren't parts of divine minds, it could be difficult for him to find grounds for thinking that he himself exists in one of those universes instead of inside a divine mind. In my eyes, though, this would be no argument against his modal realism.

Lewis is correct in writing that 'incredulous stares' do nothing to refute him. Yes, his theory does (as he at once goes on to say) tell you that there are 'uncountable infinities of donkeys and protons and puddles and stars, and of planets very like Earth, and of cities very like Melbourne, and of people very like yourself', yet this does not put him on a definite collision course with the demands of simplicity. As has been forcefully argued by R. H. Kane, by Robert Nozick, and by Peter Unger, a cosmos in which absolutely all possibilities were actualized might actually be considered *simpler*—just look at how few words ('a cosmos in which all possibilities are actualized') would be needed for identifying it!—than a cosmos that included merely some of them (Lewis 1986: 133; Kane 1976; Nozick 1981: 123–30; Unger 1984).

Besides, reality-as-a-whole couldn't be made *vastly richer* because

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Lewis was right. Whether or not Lewis is right, reality-as-a-whole is infinitely rich. You need not share my taste for pantheism in order to accept this. The Real is infinitely rich because infinitely many possibilities, some of them possibilities which are themselves infinitely intricate (for instance, possible universes each extending infinitely in space and in time), *really are* possibilities. Lewis may be wrong when he classifies them as real existents, every one of them. Many may be nothing more than real possibilities. But a possibility is no less real, and no less intricate, simply through remaining confined to the land of the possible. The kingdom of possibilities isn't a fiction. If it were, then there would have been no conceivable alternative to whatever actually exists, which is a doctrine few would willingly accept.

Where Lewis can nevertheless appear in genuine trouble is over induction, the method of reasoning that assumes that the future will obey the same basic laws as the past. He expresses the point as follows:

According to my modal realism, there are countless unfortunates just like ourselves who rely on reasonable inductive methods and are sorely deceived. Not the best but the third best explanation of their total evidence is the true one; or all their newly examined emeralds turn out to be blue; or one dark day their sun fails to rise. To be sure, these victims of inductive error differ from us in that they are not actual. But I consider that no great difference. They are not our worldmates, but they do not differ from us in kind.⁶

In view of this, may we not have to conclude that (as he puts it) any modal realist 'has no right to trust induction—he should turn sceptic forthwith'?

Lewis offers us two replies. The first is that everybody else is in the same boat as he is. It is 'possible, and possible in ever so many ways, that induction will deceive', but everyone has to accept this. By trusting that our world won't suddenly start behaving crazily 'we run a risk'; but people cannot deny this, whether or not they believe that worlds of all possible varieties exist in parallel to ours.

Is that an adequate reply? If so, I would recruit it to defend my pantheism, but unfortunately it runs into the following problem. For every

⁶ Lewis 1983: 23. All the immediately following quotations are from this page, the next, and Lewis 1986: 115–23.

way in which a world could continue in an orderly fashion, there can appear to be many more ways in which it might continue in a disorderly fashion. Suppose we are watching a stone as it starts to fall at a time when no winds are blowing. Lewis and I agree there are countless ways in which stones exactly like this one could conceivably behave in universes that had all of them been exactly like ours right up to the present moment. Any such stone could fall in a straight line slanting slightly to the north, or a lot to the north, or by a medium amount to the north-east, etc.; or it could fall in a spiral or in a zigzag in which each zag was 2.3 times as long as the preceding zig, or in another zigzag in which the figure was 55.9; or it could stop falling and hover in mid air, or explode, vanish, or turn into syrup. What if these and all other possible forms of behaviour were each adopted somewhere, in worlds that had until now developed in precisely the way in which ours had done? It could then seem almost certain that you and I, if continuing to watch the stone instead of ourselves vanishing or becoming syrup, would find ourselves in one of the worlds in which it behaved in a style that no rational person would expect.

What is our actual situation, though? Sure enough, you and I may have to accept that hugely many *possible people* would find themselves in worlds that started to develop crazily, yet at least we can believe that those possible people are merely possible, there being no really existing world in which stones behave in ways so fantastic. Lewis, in contrast, could seem forced to defend the position that worlds in which stones suddenly act bizarrely not only exist but are much more common than worlds in which they continue to behave as you and I would rationally expect. And then instead of simply being in the same boat as us, the boat of not being able to guarantee that inductive reasoning will deliver the right results, he could seem to be doing his best to guarantee that it would deliver the wrong ones.

Lewis, however, is an extremely skilful philosopher, and his second reply hurries to the rescue of the first. It is a flat denial that the possible worlds in which inductive reasoning failed would be in the majority. He argues that the worlds in which it failed *and also those in which it succeeded* would be infinitely numerous, and that in consequence nobody ought to claim that it would fail 'in most of them'.

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Look again at my stone. Of the conceivable ways in which this stone could move, infinitely many would be only barely different—quite undetectably different—from falling precisely vertically all the way to the ground. How, then, could anyone be forced to accept that ‘most’ ways of falling would make inductive reasoning fail?

To drive home his point, Lewis considers the case of the prime numbers. We might be tempted to claim that these were obviously extremely rare among all the whole numbers because the proportion of primes gets smaller and smaller as you continue counting. But wait! Aren’t we dealing with infinities in each case? Cannot we therefore challenge any particular ‘partitioning’ of the primes and the non-primes? We might, for instance, challenge the partitioning that would be set up by starting to count from the number one, collecting the non-primes into four columns which soon started to lengthen far more rapidly than the single column into which we put every new prime. Another partitioning of the primes and the non-primes would reverse this situation.

Similar reasoning attracted Georg Cantor whose approach will be discussed in the next section. It has much in its favour. Experts often do say such things as that talking of ‘the low probability that a whole number picked at random from the infinitely many whole numbers will turn out to be prime’ is nonsense. But other experts, particularly among the physicists, reckon that there can be ‘natural’ methods of partitioning infinite sets, and that science and common sense in effect rely on these methods. Suppose we grant that the number of points on a dartboard is strictly infinite both outside the tiny central bull’s-eye and inside it. It can still make sense to say that the chances of a dart’s hitting the bull’s-eye are small because the set of points outside it is ‘importantly larger’ than the set of points inside. Maybe not larger *in number* since infinities, at least if they are at the same Cantorian level, cannot be said to differ in number, at least if Cantor’s way of understanding ‘equality in number’ is accepted; but larger none the less. Or at any rate *different* in a fashion justifying, prior to actual experiments, the belief that darts thrown at a dartboard will mostly not land in the bull’s-eye unless thrown by the specially trained. A standard way of expressing the difference is that *the range* of the points outside the bull’s-eye is larger.

This can be important in quantum theory. Apparently absurd possibilities are envisioned here: for example, suddenly finding that the particles of a neutron star had all of them decided to jump inwards so that the star collapsed to form a black hole. One sees actual calculations of how long you would have to wait on average—it turns out to be a number of years so great that, writing it out by starting with a nine and then adding zeros, you would need many more zeros than there are atoms in our galaxy—in order to observe any given neutron star behaving in so strange a manner. Now, quantum theorists have confidence in such calculations even when thinking that infinities are involved. Yes, the number of ways in which the inwards jump of the particles could occur, and the number of ways in which it could fail to occur, may perhaps both be infinite, but the range of the ways in which it could occur is comparatively tiny.

Consider, too, the possibility that there exist infinitely many universes very much like ours, or that our own universe is itself infinite as can seem to be suggested by observations (which are often thought to reveal a universe whose gravity is too weak to wrap its space around until it joins up with itself like the finite surface of a sphere). We might then expect the existence of infinitely many planets much like Earth, and infinitely many cold puddles that suddenly began boiling through drawing heat from their equally cold surroundings. After all, elementary physics—no need to introduce quantum theory here!—tells us this is always possible, though it is normally considered not nearly as likely as tossing a trillion heads in a row. What if we argued that the infinitely many puddles which failed to boil couldn't in any fashion outweigh the infinitely many which did boil? Even if the merits of inductive reasoning impressed us enough to make us feel sure that the laws of elementary physics would continue to be obeyed, our confidence that the next observed puddle would fail to boil ought now to be severely eroded.

Notice also that Lewis's point about partitioning could lead to severely counterintuitive results in ethics. Imagine an infinite number of mansions each inhabited by three happy people and ninety-seven miserable ones. You learn that some demon created these people. The demon had the power to fill each mansion with people

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whose distribution of happiness and misery was the reverse: ninety-seven happy people to three miserable ones. None the less, he decided not to. An evil decision, surely—yet our ability to choose different ways of partitioning the people could suggest that it would be wrong to declare that ‘the real proportion’ of happy people to miserable ones was worse than it might have been. Following Cantor, many a mathematician would reject any such declaration as meaningless. My suggestion, in contrast, is that we need some understanding of the word ‘proportion’ that would permit it. The demon’s decision would be evil, and how else than by making it true that there were, in some crucial sense, proportionately fewer happy people than there might have been? Cantor’s way of defining ‘equality’ in the case of infinite sets may not be the only possible way. Henri Poincaré was firmly against it calling Cantor’s approach ‘perverse’ and ‘pathological’ (Dauben 1979: 1).

Arguments in this area become very complicated. I cannot claim to have proved beyond all doubt that Lewis is wrong. Still, both his system and my own seem in fairly grave difficulties. My preferred way of escape from them is to say that not all knowledge would be worth having. Detailed knowledge of messy worlds, such as ones which suddenly began behaving crazily, would be knowledge *not* worth having. A divine mind therefore wouldn’t contemplate such worlds, and no pantheist need fear that he or she inhabits one of them. However, before investigating this we should look at a curious suggestion. It is that unlimited divine knowledge is not even possible, for reasons to do with the mathematics of the infinite.

Does Unlimited Knowledge Run into Cantorian Difficulties?

According to Patrick Grim, Cantor’s treatment of infinities reveals that there cannot be any such thing as *the set of all truths*. From this it follows that divine knowledge would necessarily be limited. There have to be truths, infinitely many truths, that God does not know (Grim 1991).

God’s knowledge could still be infinite in a sense not meaning ‘unlimited’. On a mathematically standard understanding of what

‘infinite’ means, a mind’s knowledge would be infinite if the mind knew the weight of every single cabbage in an infinite line of cabbages while remaining ignorant of the existence of carrots. ‘Infinite’ does not have to mean ‘including everything’. What Cantor is usually taken to have demonstrated is that there are levels of infinity. Infinite numbers of ever increasing size are reached as we climb to higher and higher levels. What is more, the notion of a highest-numbered infinity is nonsense. So, Grim concludes, Cantor has destroyed the idea of a divine mind whose knowledge is absolutely unrestricted.

Grim’s reasoning can be opposed on various grounds, though. For a start, it can be urged that whether one infinity should be treated as greater than another, even at the lowest of the levels recognized by Cantor, ought to depend on what background story we tell. Dead, you are informed by the devil that before entering heaven you must read through an entire library of his. It has infinitely many books. Would it speed things up if you received his permission to read just the odd-numbered ones? Unfortunately not. In this story, the set of *all the books* and the set of *the odd-numbered books* are of identical depressing hugeness. But now, suppose instead that continuing to read books from the devil’s library is your sole means of keeping him from carrying you off. Floodwaters are approaching. The odd-numbered books are near the ground and will be rendered unreadable. Why not say that *in a sense*—not the sense of interest to Cantor but a useful sense all the same—the infinity of all the books, including those which will survive the flood, is ‘an importantly larger infinity’ than the infinity of those near the ground?

Duns Scotus noted that, given two concentric circles, absolutely any point on the larger circle could be ‘paired off’ with another on the smaller. Take a point at random on the larger circle. Draw a line joining this point to the circle’s centre. The point at which the line cuts the smaller circle is the required other half of the pair. Intrigued, over three centuries later, by a similar truth concerning how whole numbers could be paired off with their squares, Galileo concluded that the words ‘equal’, ‘greater’, and ‘less’ were simply not applicable to infinite quantities. But Cantor chose differently from Galileo. When there was any way whatever of pairing off all the members of one set with the members of another, he chose to treat this as immediate grounds

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for calling the sets 'equal in number'. In other words he defined 'equality in number' in terms of the possibility of finding one-to-one correlations between the members of various sets, even when the sets were infinitely large. He *stipulated* that this was how the phrase was always to be understood. Cantor's definition is often fruitful mathematically: so much so that it has become standard among mathematicians. Yet this does not guarantee that it entirely lacks the kind of arbitrariness that characterizes so many definitions when they go beyond previously well-established usage.

It is, after all, unclear to what extent Cantor's results apply to anything 'in the real world', that is, anything beyond what happens in symbolic systems when the symbols are manipulated according to various rules, the symbols themselves being defined by stipulating which rules apply to them. Writing about this area, I was much too quick to say (1995*a*: 'Finite/Infinite') that mathematicians (*all* mathematicians?) happily accepted that an infinite hotel whose every room was filled could still welcome infinitely many further guests, thanks to the hotelier's ingenious shuttling of guests from room to room. The fact is that even David Hilbert—who admired Cantor's approach and used the hotel in question to illustrate it—said that Cantor's results might have no application to realities outside pure mathematics. When a weary traveller arrives at Hilbert's already filled hotel, it is tempting to think that moving the guest previously in room #1 to room #2, and the one in room #2 to room #3, and so on, would only defer the hotelier's problem. It might defer it so successfully that no symbolic manipulations could ever produce the message that the problem would prove insuperable at such and such a stage, but how could it solve it? The sheer fact that a concept is fruitful mathematically is no guarantee that it corresponds to a reality. (Perhaps *the square root of minus one* illustrates this, but also perhaps not; one sometimes hears, for instance, that its use can correspond to rotating the axes of one's graph. For a less controversial example, consider *negative probabilities*. Physicists occasionally find that bringing these into their calculations speeds them to the right answers⁷ yet this could scarcely show that there can

⁷ Richard Feynman, 'Negative Probabilities', Hiley and Peat 1987: 235–48.

be probabilities lower than zero. ‘Zero probability’ means utter impossibility, and you cannot have anything less probable than that.)

Possibly more crucial, though, is that any ultimate limits to knowledge which Cantor may have demonstrated *might concern nothing more than truths collected into sets*. It can be argued that Cantor (who was deeply religious) recognized this and concluded that God’s knowledge was without any significant limits. The crucial point is that not all collections can be called ‘sets’. Here is a standard way of proving it. Some sets are members of themselves: the set of things identifiable in plain English, for example, is itself identifiable in plain English, which is how I have just now identified it. Other sets are not. The set of rabbits is not itself a rabbit. Now, consider those sets that are not members of themselves. Can they be collected together into a set of all sets that are not members of themselves? No, for this would lead to a contradiction. Compare how there cannot be an adult male barber who shaves all and only those adult males of his village who do not shave themselves. Were there such a barber, then there would be no consistent answer to who it was that shaved him.

True, one of Cantor’s letters calls the totality of all that is thinkable ‘an inconsistent multiplicity’. But this, it can be held, did not mean he believed in limits to what God could know. What it instead meant was that God’s thoughts could not form *a complete set*, on the usual technical definition of what *a set* has to be.

I have derived this way of reacting to Grim from work by Plantinga, J. H. Sobel, and A. W. Moore.⁸ While it perhaps cannot be claimed that Cantor ever said precisely what I am suggesting, it seems compatible with what he did say and in particular with the following passage:

The actual infinite arises in three contexts: first when it is realized in the most complete form, in a fully independent other-worldly being, *in Deo*, where I

⁸ Plantinga and Grim, 1993; draft material that Sobel generously let me see; Moore 1990, 1995. Moore repeatedly recognizes his indebtedness to Ludwig Wittgenstein. The latter was highly suspicious of Cantor’s alleged discoveries that some infinite sets were really bigger than others, whereas various further infinite sets were despite appearances really of the same size, when these discoveries were interpreted as concerning realities beyond those of *how various symbols were conventionally manipulated*. See Moore 1990: 139–40, for instance, with their quotations from Wittgenstein 1976, 1978.

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call it the Absolute Infinite or simply Absolute; *second* when it occurs in the contingent, created world; *third* when the mind grasps it *in abstracto* as a mathematical magnitude, number, or order type. I wish to make a sharp contrast between the Absolute and what I call the Transfinite, that is, the actual infinities of the last two sorts, which are clearly limited, subject to further increase, and thus related to the finite. (Cantor 1932: 378, as tr. at Rucker 1983: 10)

Here, Cantor can be interpreted as telling us that there are some infinities (for example, the infinity of things that a created world might contain) which can be ranked by applying his ‘possibility of pairing off’ criterion of whether one infinity is equal to or larger than another. These infinities, however, are all of them surpassed by an infinity found in God (*in Deo*), an infinity that is not limited, not ‘subject to further increase’. What if we granted that God could never know any reality describable as ‘the set of all truths’ because (on a standard way of understanding what is meant by *a set*) this would be like knowing a triangular circle or a wifeless bigamist? The sentence ‘Every member of the set of all truths is not a falsehood’ would then have to be rejected. All the same, we could surely deny *that at least one truth is a falsehood*. And similarly, we might feel inclined to deny *that there is at least one truth which God does not know*.

Unlimited Knowledge Could Well be Undesirable

A pantheist (or even just a believer in a supremely knowledgeable Creator) could reasonably accept that divine knowledge extended not just to immensely many universes, but to vastly many other things as well—to vastly many chess-like games, for instance. Although less deep than *shogi* (Japanese chess) in which captured men can return to the board to fight against their former allies, western chess is a superb game, making it pleasant to think that the divine mind contains knowledge of all possible sequences of moves in it. But how about games rather similar to it? Would it be good to contemplate every last possibility here? In his *Encyclopedia of Chess Variants* David Pritchard (1994) tells us that many thousand such games have actually been

developed by humans. They include two mind-benders of V. R. Parton's invention: 'Alice', in which men repeatedly 'pass through the looking glass' between one board and another, and the crushingly complex 'Ecila' in which a six-dimensional board is simulated. An entire journal, *Variant Chess*, is devoted to such possibilities in ever increasing numbers. In a recent issue, for example, Pritchard discussed what he called the variant of the decade. Named 'Hostage Chess', this is a new means of fusing western chess with *shogi*, which it does by allowing exchanges of prisoners.⁹ Yet is Pritchard right in his statement that the number of possible chess variants 'is infinite'? To make him right, we shall have to count even variants that are immensely complex, soon reaching ones no human could understand. As is shown by quantum field theory, a lump of matter the size and mass of a human could encode only about a billion trillion trillion trillion *bits*, the simplest possible elements in any message (see Tipler 1994: 407–11; or Moravec 1999: 166). This no doubt limits how far human thoughts could conceivably extend. God's mind, in contrast, might be equal to the task of grasping infinitely many chess-like games of ever increasing complication (one can keep adding more dimensions to the chessboard, for a start) together with absolutely all positions reachable when playing them. Would it really contemplate the lot? Pritchard confines himself to listing about one and a half thousand variants, commenting that anyone can invent another in ten seconds 'and unfortunately some people do'. Could it be good for the divine mind to plough through all the hopelessly unsatisfactory games that humans have come up with, considering all

⁹ Western rules, except the following. Each player owns two areas at the side of the board—a prison for captured men, near the player's right hand, and an airfield near the left. In each turn you (i) move normally, or else (ii) rescue one man from the enemy prison by transferring one of equal or higher value from your prison to the enemy airfield, then at once parachuting the rescued man onto a vacant square, or else (iii) parachute one man from your airfield. (Values run from *pawn* upwards to *knight* or *bishop*, then *rook*, then *queen*. Pawns cannot parachute onto first or eighth ranks, but parachuting can place your bishops on squares of the same colour. Pawn jumps from the second rank and acts of castling can involve parachuted men regardless of their earlier positions or movements.) A seventh rank pawn can move forwards or give check only if able to be promoted by changing places with a piece in the enemy prison. See the chapter 'Hostage Chess' in Pritchard 2000.

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possible moves in each of them before moving on to infinitely many others which were yet worse?

Again, how about endless sequences of the utterly tedious kind? (i) The word ‘that’ can start an English sentence, can’t it? That *That* can start a sentence is a fact. (ii) That *That that* can start a sentence is therefore another fact, as just now demonstrated. (iii) That *That that that* can start a sentence is therefore yet another fact. . . . And so on, in an infinite series. Well, does the divine mind contemplate every member of the series? And does it next contemplate the point that the member in question is one truth among many, and then the point that it is a truth that it is a truth, and then the further point that it is a truth that it is a truth that it is a truth, and so forth?

In addition to contemplating our universe in all its details, does the divine mind keep track of the distance not just between each particle and its nearest neighbour, but also between it and its next nearest neighbour, etc.? Further, is it vividly conscious of the radius in inches and in millimetres of the smallest sphere that would include each particle and its 773,004,229,924 nearest neighbours, plus—for how could this be avoided if the divine mind knew *absolutely every truth?*—the result of replacing inches or millimetres by a unit defined as 0.136 per cent of the distance between God’s outstretched finger and Adam’s in Michelangelo’s *Creation of Man*?

Is a great deal of God’s knowledge to be compared with the dreadful Library of Babel imagined by J. L. Borges, filled with infinitely many books in which all possible arrangements of the alphabet’s letters can be found? Hugely many of the books would be intelligible, of course. (An immortal parrot pecking randomly at a typewriter would take only about $10^{3,000,000}$ years—write down one followed by three million zeros and you’ll see how brief a period *that is*—to peck out Conan Doyle’s *The Hound of the Baskervilles*: Crandall 1997: 77.) But through what oceans of nonsense you would have to trawl before finding an intelligible sentence! Is God in eternal contemplation of every single page?

As well as thinking about utterly meaningless combinations of sounds, does God think about all possible bad radio plays, incompetent performances of awful music, ugly distributions of paint blobs on

canvas, unrelievedly boring spells of imprisonment? Does God consider exactly how it feels to be done to death not merely in all the manners in which humans have done one another to death, but in all possible further manners, in the bodies of all possible physical organisms? Besides experiencing all the sorrows that humans have actually endured, does God contemplate (in full detail) every other sorrow in an infinite number of further universes? And does God know precisely how it feels to be intelligent living beings of sorts which could never have evolved in any universe but which are still (unlike triangular circles) logical possibilities and which are in terrible agony, both physical and mental?

While it is hard to be confident of anything here, it can at least seem quite likely that a divine mind *would not* be the better for being conscious of absolutely all facts about actual or possible situations. Is God aware of precisely what would have resulted if at noon yesterday a sunflower had suddenly appeared in your hand, from nowhere? If the third pebble your foot collided with last week had become 4.83 times heavier just before the collision? If the world's largest ruby had suffered some slight change in its colour at that same instant? And does the divine knowledge extend to a world in which you suddenly vanish or turn into syrup? The answer to all such questions could be 'No'.

Unlimited Knowledge Might Perhaps Be Impossible on Grounds Going Beyond Mere Logic

It could well be, then, that my pantheism is not in trouble over inductive reasoning. The divine mind might not keep track, even, 'of exactly how many molecules are discarded when people file their fingernails', which Grace Jantzen (1984: 83) gives as a case of something too trivial to bother with. The matters which God contemplates in detail are those which are worth contemplating in detail. Worlds in which the laws of physics suddenly break down are not. Any knowledge worth calling divine would no doubt include a recognition that immensely many such worlds were possible, but it wouldn't involve knowing their structures in full. Pantheists need therefore have no

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fear of finding themselves inside one of them. (There could still be some very slight danger of finding oneself in a situation which suddenly behaved in one or other of the bizarre ways that physics cannot rule out, yet this hardly worries me. The number of years needed for quantum fluctuations to topple a beer can on a level surface vastly exceeds the number required by our *Hound of the Baskervilles*-typing parrot.)

While this is my preferred means of maintaining my trust in induction, other means might work as well. Lewis might be right about infinities. Or it might perhaps be that the divine knowledge was limited by factors which were not mathematical (as imagined by Grim) and also not ethical. Perhaps it really would be good for God to contemplate infinitely many worlds in which inductive reasoning failed, if only it were possible to contemplate them *as well as* all those in which it didn't fail, all the beautiful symphonies, all the elegant chess variants, etc. Yet contemplating more than a limited amount may be impossible in point of fact, on grounds whose nature we could at least suggest.

What might the grounds be? Well, it might be impossible to keep compressing more and more complexity into any mind sufficiently unified for its consciousness to form *a whole worth having for its own sake*. The divine knowledge would have immensely many components, but wouldn't they be 'mere abstractions', rather as a stone's shape, its colour and its length are abstractions instead of existing separately? There is nothing too outlandish in this idea. Quantum physics on the one hand, and our experience of our mental states on the other, may give us (see Chapter 2) grounds for denying that the elements of complex situations *are always separate in their existence*. Nevertheless we have little insight into how this would be possible. From which it follows, presumably, that we have no right to be confident that anything, even a divine mind, could be an arena of absolutely unlimited knowledge while remaining adequately unified.

Look again at the sort of thing—it may strike you as ludicrous but it cannot be avoided—that such unlimited knowledge, *knowledge of every single truth*, would have to involve. Consider a mind which, as well as contemplating some particular apple in all its details, was

keenly aware of the fact that the apple's mass was 45.364 times that of a particular worm on some distant continent, plus the fact that 45.364 was a number 8.79 times smaller than the length in centimetres of some particular rock on the surface of Venus, and also the truth that expressing all this in Portuguese words and Arabic numerals would require a minimum of such and such a number of characters and that these, on some particular computer screen with the font size set to 12 in the typeface Letter Gothic, would extend exactly such and such a number of inches, a number standing in such and such a ratio to the number of atoms (several billion, believe it or not¹⁰) which ever became incorporated into the body of Johann Sebastian Bach after once forming part of the horse mounted by Vercingetorix at Alesia, etc., etc. Would it truly be possible for all of this—extending off to infinity in all directions in fantastically bizarre and entangled ways, with each new fact standing in countless new relationships to every other, each of these relationships itself being a new fact standing in countless further relationships—to be crammed into any whole that was unified in its existence? Heaven only knows. Perhaps not even a divine mind could contemplate absolutely every truth because its existence couldn't remain unified while being more and more spread out like a sheet of gold hammered ever thinner.

Pantheistic Writings

'Pantheism' is a word that has been given numerous different senses: for a survey of them, see a recent book by Michael Levine (1994). Still, one can say that what I have been defending certainly deserves the name 'pantheism' and that something at least vaguely like it can be found in many other places—in Hinduism, for example, and particularly in the Upanishads; in much Jewish thought, which greatly influenced Spinoza; in much of the Hegelian thought that started where

¹⁰ See Heidmann 1992: 40–1. Of the living matter existing on our planet at a time earlier than a thousand years ago, almost every gram has bequeathed about a thousand hydrogen atoms to your own body of today, there being so immensely many atoms in each gram.

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Spinoza left off, although perhaps not always improving on his ideas;¹¹ and, of course, in Spinoza's own writings.

'Of course'? Unfortunately, hardly anything is agreed nowadays in the field of Spinoza scholarship.¹² You will actually find one of the main authorities suggesting that Spinoza, when he insisted that the universe was a single, fully unified entity, meant only that it was obedient throughout to a single set of laws. My notion that the material world is just God's thinking about physical structures in all their details—which is the interpretation I put on Proposition Seven of Part Two of Spinoza's most famous work, the *Ethics*, that 'the order and connection of ideas is the same as the order and connection of things', with its Scholium commenting that this had been 'glimpsed by those Hebrews who hold that God, God's understanding and the things which God understands are all one and the same thing'—will be sure to strike some of the authorities as in conflict with Spinoza's actual position because of giving too much primacy to God's attribute of mentality. There are those, too, who argue that by 'God' Spinoza simply meant the universe as a unified whole, while by 'goodness' he intended something like 'degree of completeness of being', period. To all which I can only reply that, despite all the definitions, axioms, propositions, demonstrations, corollaries, lemmas and so forth deployed in his *Ethics*, and also despite his being a hero of mine, Spinoza seems to me rather an unclear thinker. If you want to see pantheism defended clearly, it

¹¹ The kind of Hegelianism once popular in Britain may be as interesting as anything Hegel himself wrote. F. H. Bradley's *Appearance and Reality* is particularly famous but A. E. Taylor's *Introduction to Metaphysics* is much easier to understand. Let me emphasize, though, that I dislike many typically Hegelian claims: for instance, that reality is often utterly different from how it appears to be, or that events are never tragic in any ultimately important way.

¹² Major disagreements on interpreting Spinoza centre hardly at all on how individual sentences should be translated—something which can also be said about the other philosophers whose translated words appear in this book. With a large variety of published translations to choose from, the book still sometimes gives its own wordings, taking full responsibility for these as well as for the accuracy of any suggested by other people instead of repeatedly sending the reader to numbered notes. However, in the case of Spinoza those wanting to read more could well go to Curley 1985. Other useful sources include Shirley 1982 and Wolf 1910. And Victorian renditions retain their charm. Slightly revised, they can be found in Gutman 1949.

would be far better to look at Sprigge's masterpiece, *The Vindication of Absolute Idealism*.¹³ I claim only that the sort of thing I defend might reasonably be called 'Spinozistic'.

As an illustration of how hard it is to interpret Spinoza, consider whether he thought that God's reality included absolutely all possible things. It is very commonly said that he did think this. People point to Proposition Sixteen of Part One of the *Ethics*. This tells us that from the necessity of the divine nature 'infinitely many things must follow: that is to say, all the things which can be conceived by infinite intellect'. And yet, look next at Proposition Eight of Part Two. Here we are told that the ideas of *non-existent* individual things are included in the infinite idea of God. Well, how can anything at all be non-existent if infinitely many things are conceived by the divine intellect, all of them therefore 'following' (which must surely be taken to mean that they don't remain merely possible)? Must we understand Spinoza as saying that, Yes, God does think of infinitely many things, but No, he doesn't think of all possible things? That the situation is as if God thought of infinitely many cabbages but never of carrots? Well, in a Note to this Proposition Eight we are offered an analogy. Spinoza asks us to consider a circle which can be thought of as including infinitely many rectangles formed where chords intersect, rectangles which have interesting properties. Of the intersecting chords we are asked to conceive two only as *existing*. This could seem to show that he distinguishes between two ways in which things could be included in God: being included as possibilities that God understands—genuine possibilities with definite properties—and being included as truly existing things. But how could that be made consistent with Proposition Sixteen of Part One?

I must leave the point to the experts—if indeed anyone, even Spinoza himself, could ever have been expert about any such thing as 'how Spinoza's system really runs'. It has been known, after all, for truly great philosophers to defend contradictory positions when the arguments tug first in one direction, then in another.

¹³ Sprigge 1983. See also Sprigge 1984: ch. 8 ('Spinozistic Pantheism'), and Sprigge 1997. Sprigge has written to me that, in the sense in which I am a Spinozist, he is one too.