1
Atheism and Theism

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1 Introduction

In this 'great debate' I shall be giving what I hope will be seen as a sympathetic critique of theism. I was once a theist and I would still like to be a theist if I could reconcile it with my philosophical and scientific views. So I shall not be too sorry if John Haldane wins the argument. I do not really expect that we will come to agreement, but at least we may achieve a better and perhaps more sympathetic understanding of one another's positions. I hold that there are never – or perhaps rarely – knock-down arguments in philosophy.[1] This is because a philosopher may claim to question anything, so that both the premisses and the methodology are liable to challenge. This can happen in science too, and if the challenge is to central and unquestioned beliefs or methods the scientific debate will be seen as philosophical. One important methodological principle of mine is that an important guide to metaphysical truth is plausibility in the light of total science. Of course other philosophers may take another tack. Some may even hold that our best theories will come to be overturned and that there is no accumulation of sure scientific knowledge. Here I think that they would have taken to extremes Thomas Kuhn's theory of scientific revolutions.[2] Is it plausible that revolutionary new theories about the ultimate constituents of matter or about what happened in the first microseconds after the 'big

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bang' will affect our understanding of the physiology of respiration, or the fact of evolution of species, the distance from the sun of Alpha Centauri, or why gunpowder explodes? There is controversy about the interpretation of quantum mechanics, but the facts it tells us seem secure. Even when a theory is overturned it can usually be seen as an approximation to the truth.

My position here may be castigated as 'scientism'. It may be claimed that there are ways of knowing that are additional to (or alternative to) the scientific method: for example the inner deliverances of consciousness, religious experience, or even the assumptions of common sense. I of course would attempt to explain or explain away such putative non-scientific ways of knowing. I should make it clear that I am taking a broad view of science and scientific method, so as to include much historical, archaeological and philological investigation, as will be apparent in my brief glance later in this essay at the higher criticism of the New Testament.[3] Another problem is that even if there were agreement about the importance of plausibility in the light of total science there may well be disagreement in the assessment of plausibility. This question of assessment of plausibility is closely related to that of probabilistic inference to a hypothesis. The method depends on the theorem that the probability of a hypothesis *h* relative to evidence *e* is equal to the probability of *e* given *h* multiplied by the prior probability of *h* divided by the prior probability of *e*.[4] How do we assess the prior probabilities or estimate the relative probabilities? Furthermore, the more antecedently improbable *e* is, the greater is the probability of *h*, but how do we know whether to accept the evidence or to attempt to explain it away in some way, perhaps by distrusting our observation or bringing in other considerations that reduce our previous assessment of the high probability of *e* given *h*? Thus we may reject a report of a visitation by a flying saucer by considering how far apart inhabited planets are likely to be, and whether it would not be much more apparent that there are flying saucers if there really were such visitations. Why are they so often seen by remote farmers and why do they never land in the Great Court of Trinity College, Cambridge, or some other well-known place?

Though my approach will be largely based on the relations between science and religion it will inevitably involve us in many of the traditionally philosophical concerns, such as the main themes of, for example, J.L. Mackie's fine and formidably acute and scholarly book *The Miracle of Theism*.[5] I shall pay a good deal of attention to theological speculations arising from recent physics and cosmology, which to some writers, such as the physicist Paul Davies in his popular book *The Mind of God*,[6] and the philosopher John Leslie in his *Universes*,[7] have been thought to support broadly theistic conclusions.

2 Theism, Spirituality and Science

Notice that I have said 'broadly theistic'. A distinction between theism and deism is commonly made. In this essay I shall regard deism as a form of theism. Theism is normally taken to be the view that there is one and only one God who is eternal, is creator of the universe, is omnipotent, omniscient, benevolent and loving, and who is personal and interacts with the universe, as in the religious experience and prayerful activities of humans. I shall treat the concept of theism as what Wittgenstein called a family resemblance concept:[8] theism does not have to have all of these characteristics, so that provided that a doctrine refers to a fair number of these properties I shall tend to count it as theism. Deism is the view that there is a God who created the universe but who avoids interacting with it. Allowing the slack associated with a family resemblance concept deism can count as a form of theism. Such slack is usual in science: for example when the atom was shown not to be an indivisible particle, physicists still continued using the word 'atom' much as before. Historically 'deism' has been used especially in connection with certain British writers in the seventeenth and eighteenth centuries, such as Lord Bolingbroke (Henry St John). Latterly I think that the difference between deism and theism has become blurred, especially since so many theologians have tended to play down the miraculous elements in Christianity.

Atheism I take to be the denial of theism and of deism. It also of course includes the denial of the existence of the ancient Roman and Greek gods and the like, but anyway I do not count such polytheisms as coming under the concept of theism as I understand it. To a large extent I shall be concerned with the theism of Christianity, though some of what I say will be applicable to the theologies of the other great monotheistic religions.

Spirituality

The orthodox conception of God is that of a spiritual being. Though the concept of the spiritual pre-dates Descartes, the usual notion of the spirit is close to that of a Cartesian soul: something immaterial, not even physical. There is, however, an emasculated notion of spirituality that can cloud the issue. One might talk of the spirituality of some of Haydn's music, meaning no more than that it was uplifting or that Haydn was influenced in his writing of it by adventitious connections with his religious beliefs. A materialist about the mind could consistently use the word 'spiritual' in this emasculated way. Again even a materialist and an atheist could agree in describing Mary who is happy in an enclosed convent as a 'spiritual' person, meaning

simply that she is a person who has a strong urge to engage in prayer and worship, notwithstanding the fact that the atheist will disagree about whether there is such to and fro communication with a divine being.

Prayer, and other cognate activities, at least as they are understood by orthodox believers, as opposed to sophisticated theologians who themselves verge on deism or atheism, do not seem to be explicable on normal physical principles. We communicate with one another by sound-waves and light rays. Such communication fits in with neurophysiology, optics, theory of sound and so on. What about prayer? Are there spiritual photons that are exchanged between God and a soul? Perhaps the theist could say that God is able to influence the human brain directly by miraculous means and that he can know directly without physical intermediaries the worshipful thoughts in Mary's mind or brain. This story will just seem far-fetched to the deist or atheist.

Materialism and the 'New Physics'

Materialism has of course been thought to be inimical to theism and some theistic writers have incautiously rejoiced at the demise of nineteenth-century physics with its ontology of minute elastic particles, elastic jellies, and the like. That great man, Lord Kelvin, spent some of his exceptional talents and energies in trying to devise mechanical models to explain Maxwell's equations for electromagnetism. The idea is now bruited about that since modern physics rejects this sort of materialism the omens are better for a more spiritual account of the universe.

A good recent example of this can be found in the very title, *The Matter Myth*, of a popular book by Paul Davies and John Gribbin.[9] Matter is not mythical: a stone is a piece of matter and it is trivial that stones exist. Looked at quantum mechanically (e.g. in terms of an extraordinarily complex wave function whose description we could never hope to write down) the stone indeed has properties that may look queer to common sense. Thus its constituents would not have simultaneous definite position and velocity, there would be phenomena of nonlocality and descriptions would be more holistic than their rough equivalents in classical physics. Indeed even the stone, supposing it to be on the top of a cairn, would be only approximately there and it would to a tiny extent be everywhere else, though the extent would be so small that we can totally ignore it. Not so with small constituents of the stone, such as electrons, which cannot even approximately be treated classically. Still, being constituents of the stone they surely deserve the appellation 'matter'. Even so the domain of the physical is wider than that of the material. Thus I am inclined to believe in absolute space–time (though not absolute space and time taken separately) and to believe that space–time is made up of sets of points. Points and sets of them are hardly 'material', but if

physics needs to postulate them we must regard them as physical. Similarly Quine has held that we should believe in mathematical objects, for example, numbers and sets of them, because mathematics is part of physical theory as a whole, and the theories are tested holistically by observation and experiment. If Quine is right we must regard the mathematical objects as physical, and yet they are not material. Thus I prefer to describe myself as a physicalist rather than as a materialist, except in the context of the philosophy of mind where I hold that the distinction is not important. A neuron or even a protein molecule is a macroscopic object by quantum mechanical standards. The theory of electrochemical nerve conduction, the operation of neurons, nerve nets, and so on, is hardly likely to be affected by quantum field theory and the like.[10] I concede that quantum mechanical effects can occur in the neurophysiological domain: thus the retina is sensitive to the absorption of a single photon. This need not be of any significant importance for understanding the general working of the brain.

As a corrective to the presently canvassed idea that the so-called 'New Physics' is more compatible with religious views than was the deterministic nineteenth-century physics of Newtonian particles and gravitational attractions, together with some ideas about electromagnetism and thermodynamics, let us compare the present situation with that of the middle and late nineteenth century when William Thomson (Lord Kelvin) questioned the estimates that geologists had made of the antiquity of the earth. Kelvin had several arguments, of which the most persuasive were (1) the rate of cooling of the sun, assuming that the only source of its radiant energy was due to the loss of potential energy in its gravitational collapse, and (2) calculations based on the rate of cooling of the earth and plausible assumptions about the initial temperatures inside the earth. Geology and evolutionary biology seemed incompatible with physical laws, since Kelvin's calculations allowed only an age of 50 or 100 million years at most. The situation was saved in Kelvin's old age by the discovery of radioactivity. This suggested that there were other possible sources of energy, even though the theory of nuclear fusion and of the reactions that keep the sun going still lay in the future.[11] In any case Kelvin thought that it was unbelievable that the emergence of life could be accounted for on the basis of physical law. Though he was not a vitalist in the crude sense, since he denied the existence of a specific vital energy, he seems to have thought that though living beings obeyed the principle of conservation of energy, a vital principle enabled them to get round the second law of thermodynamics which had been propounded years before by Kelvin himself.[12]

Contrast modern biology, with its strong biophysical and biochemical core, its neo-Mendelian and neo-Darwinian theory of evolution, and molecular biology in genetics. It is true that it is not known how life arose naturally

from inorganic matter, but there are hints that the problem at least is not as hopeless as Kelvin thought.[13]

Is There a Conflict between Science and Religion?

Why then is it commonly said that conflict between science and religion is a thing of the past? At least the outlook is bleak for those who see a 'God of the gaps'. Certainly the 'New Physics' makes us see the universe as very different from what untutored common sense tells us. Moreover the more physicists discover and the more they are able to unify their theories (e.g. of the four fundamental forces) the more wonderful the universe seems to be, and a religious type of emotion is liable to be aroused. On the other hand developments in biology can go the other way. As I suggested earlier, biology has become increasingly mechanistic. It is true that a sort of wonder is also appropriate, since it is hard imaginatively to grasp the amazing adaptations that have occurred by means of natural selection. Consider the complexity of the human immune system, or the extraordinarily subtle and complex sonar system of the bat. However, I think that this wonder is different from that to which physics has led us. We have difficulty in grasping the biological complexity mainly because we fail imaginatively to grasp the vast periods of time in which this complexity developed as a result of mutation, recombination and natural selection. We can also forget the highly opportunistic ways[14] in which earlier structures have been adapted to different functions, as in the evolution of the mammalian eye and ear. Sometimes also the theory of evolution can explain maladaptation. Consider the human sinuses, in which the 'sump hole' is at the top, thus predisposing us to infections, inflammation, catarrh and pain. This is because we evolved from four-legged mammals, whose heads were held downwards, and in their case the 'sump holes' were well positioned. It should be observed that if we have a plausible general idea of how something could have occurred in accordance with known scientific principles, then it is reasonable to hold that it did occur in this natural way or in some other such way, and to reject supernatural explanations. It is interesting that (so my observation in talking to them goes) biologists are more frequently hard boiled in metaphysics. They are forced to look at human beings mechanistically and have it deeply impressed on their minds that we are mammals – 'poor forked creatures' – rather than partly spiritual beings, little lower than the angels. Moreover the medical and agricultural applications of theories of immunology, genetics, and so on, make it hard to take seriously the view fashionable among many literary and sociological academics that scientific theories are merely useful myths, and are destined to be overturned and replaced by others.

As I suggested at the beginning of this essay it is a mistake to think of theories, even in theoretical physics, merely as useful myths. A vulgarization of Thomas Kuhn's ideas has in some quarters led to much relativism about truth and reality. As a corrective to this I have frequently in the past had occasion to refer to an interesting article by Gerald Feinberg[15] in which he claims that 'Thales' Problem', the problem of explaining the properties of 'ordinary matter', has been solved. The properties of the water of the sea, the earth and rocks of the land, the light and heat of the sun, the transparency of glass, and things of that sort, can be explained definitely using only the theory of the electron, proton, neutron, neutrino and photon and their antiparticles if any. This theory is ordinary quantum mechanics supplemented by the inverse square law of gravitation. (Deeper theories, such as quantum field theory, are needed to explain the fundamental properties of the electron, proton, neutron, neutrino and photon, requiring discussion of the more recondite and very transient particles produced at high energies, but that is another matter.) This part of physics, Feinberg argues, is complete. It is not likely to be relegated to the scrap heap, as was phlogiston theory. We must remember that even revolutions allow for approximate truth in the proper domain of application of the earlier theories.[16] Newtonian mechanics gives predictions that are correct within observational error for objects whose velocities are not too high or which are not too near very massive bodies. Sometimes indeed there can be a change in ontology. General relativity shows how to replace the notion of gravitational force in favour of the geometrical notion of a geodesic, but much of classical mechanics has no need of this ontology and can be stated in terms of masses and their mutual accelerations.

With these cautions in mind, let us now look more sympathetically at reasons why the 'New Physics' has suggested a more favourable attitude to some sort of theism.

3 The New Teleology and the Old

By 'the new teleology' I mean the sort of teleological argument for the existence of God which rests its case on the wonders and fundamental laws of the universe at large. Such a teleology concedes that the sort of argument used by William Paley[17] in the nineteenth century will not do: we do not need to postulate a designer for a kangaroo, a hawk's eye, or the human immune system, since the evolution of these can be explained by the neo-Darwinian theory of natural selection together with modern genetics which includes neo-Mendelian population genetics and contemporary ideas of molecular biology. Molecular biology gives insight into the chemistry of how genes

actually affect embryological development as well as all the other continuing activities in living cells. These last have indeed been given detailed explanations in certain particular cases which have lent themselves to investigation or which have been the object of intense study because of their importance for medicine and agriculture.

The new teleology does not at all rest its case, then, on the appearance that the organs of animals and plants are as if they were designed for a purpose. It rests its case on the grand structure of the universe and the beauty of its laws as discovered by contemporary physics and cosmology. There are also arguments from the appearance of 'fine tuning' in the ultimate laws, such as that the universe is of such a nature that it is suitable for the emergence of intelligent life. Such a teleology need not be in the least controverted by the mechanistic nature of modern biology.

Have I exaggerated the mechanistic nature of contemporary biology? It may be easy enough to catch biologists in their laboratories engaging in apparently teleological talk, e.g. 'What is the purpose of T-cells?' 'What is this enzyme for?' However, this is only 'as if' talk. Natural selection mimics teleology. So it is heuristically valuable for biologists who are investigating how an organ or an enzyme works to help themselves by asking what purpose the organ or the enzyme subserves. The biologist does not believe that the organ or the enzyme came about by design, as might a certain feature of an electronic circuit. The feature of the electronic circuit was put in by the engineer who designed the circuit. Someone external, puzzling about how the circuit worked, might be helped by conjecturing the purpose for which the designer put it in. Similarly a biologist might ask heuristically 'What is the purpose of T-cells?' even while recognizing that there was no equivalent of the electronic engineer or of the engineer's purpose. It is useful 'as if' talk.[18] I think that this 'as if' teleology is recognized by most professional biologists, though there are probably some who are not explicitly sure about the philosophical issues, and others, especially in the more peripheral parts of biology, nearer to 'natural history', who may believe in genuine teleology.

Usually it is 'as if' a feature of an organism is for some purpose connected with the survival of the organism, or more accurately (remembering Richard Dawkins' 'selfish gene') of replication of the genetic material, so that, for example, helping a near relative and other altruistic behaviour can lead to such replication, i.e. survival of *gene* types.[19] Of course this heuristics or 'as if' purposiveness can backfire. Recalling the example of the 'sump hole' of the human sinus that is at the top not at the bottom, we should be misled if we thought that it was as if it was there for a purpose, unless of course we were referring to its being as if for good drainage in four-legged mammals from which we are all descended. There can also be features of an organism

that have arisen 'purely fortuitously'. I do not of course deny the fortuitous element in all evolution.

Let us therefore put aside the 'as if' teleology in modern biology, together with the earlier theistic teleology of Paley, and return to what I have called 'the new teleology'. To some extent, of course, this is a misnomer, since it is no new thing to echo the sentiment 'The heavens declare the glory of God; and the firmament sheweth his handiwork'.[20] Nevertheless the wonders and beauties of physics and cosmology are now so great and even more striking than was evident in earlier times that many contemporary theoretical physicists are prone at least to theistic *emotions* of admiration, awe and wonder. Theistic emotions are indeed in place. But the question remains as to whether theism itself is intellectually justifiable.

4 Pantheism

In trying to answer this question I think that we can set aside a minimal form of pantheism that simply identifies God with the universe. Such a pantheist does not differ from the atheist in his or her *belief* about the universe, and differs only in his or her attitudes and emotions towards it. Not for nothing was Spinoza described at some times as 'a God-intoxicated man' and at others as 'a hideous atheist'. (However, Spinoza was possibly something more than the minimal pantheist that I have in mind. For example, John Leslie has seen him as a precursor of his own 'extreme axiarchism' which I shall discuss later in this essay.[21] Moreover Spinoza thought that extension and thought were co-equal and correlative attributes of the world.) A stronger sort of pantheist may hold that the world has a spiritual aspect. One sort of pantheist may think of the universe as a giant brain – stars, galaxies and clusters of galaxies perhaps playing the part of the microphysical particles that make up our own nervous systems. I shall take it that such a form of pantheism is implausible and far-fetched. There is absolutely no evidence that the universe, however large it may be, could be a giant brain.

Closely related to pantheism is the esoteric Hindu philosophy, the Ādvaita Vedānta, of the mediaeval Indian philosopher Śankara, and foreshadowed in some passages in the Upanishads, such as the Brihad-Āranyaka Upanishad, dating from perhaps about 600 BC. 'Ādvaita' means 'non-dualism': all multiplicity (and hence the world as both science and common sense understand it) is illusion. The metaphysics has a striking resemblance to that in F.H. Bradley's *Appearance and Reality* and even more to the extreme Bradleian view of C.A. Campbell.[22] One advantage of such metaphysics is that the noumenal (Brahman, also identified by the Ādvaita with the Self or Ātman) or Bradley's Absolute is quite inconceivable, and

so on the phenomenal level we can pursue science without any danger of religious or *a priori* metaphysical conflict with it. Such metaphysics is in a way impressive but is in the end absurd, since multiplicity is evident in the very propositions we use to state it.

The upshot of this brief look at various sorts of pantheism and near pantheism is, I suggest, that the only obviously plausible form of it is the minimalist one, that pantheism differs from ordinary atheism only in that the pantheist expresses certain emotions towards the universe that the atheist does not. Ontologically there is no difference between such a pantheist and a pure atheist. One may mildly object, however, to the way in which certain scientists in their popular writings often use theistic language in a way that confuses the issue. (Stephen Hawking's 'The mind of God', repeated by Paul Davies in the title of a book,[23] and even Einstein's 'God does not play dice', though I think that it is quite clear that Einstein[24] on the various occasions in which he used the word 'God' was expressing only the minimal form of pantheism.) This use of theistic language by scientists has something in common with the way in which certain Anglican theologians have used Christian terminology to express an essentially sceptical theological position.

5 Fine Tuning and the Anthropic Cosmological Principle

The so-called anthropic cosmological principle entered into recent discussions among certain cosmologists and philosophers because of what seems to be a fortunate and *a priori* improbable 'fine tuning' of some of the fundamental constants of nature. I am of course using the words 'fine tuning' metaphorically to point to the important and improbable relations between the constants of nature without which stars, planets and life would be impossible. I do not use the words so as to imply the existence of design and a 'Fine Tuner'. This last theistic hypothesis would be a further inference, the merits of which will be considered below. In discussing the relations between fundamental constants of physics we have to be concerned with pure numbers. For example, if we say that the mass of an electron is of the order of 9×10^{-31} kilograms we are not talking about a pure number, because the number depends partly on the arbitrary convention of measuring mass in kilograms. However, when we say that the ratio of the mass of the proton to that of the electron is 1836 we are referring to a pure number. Our statement is true whatever the units in which we measure mass. The number 1836 would be as familiar to a physicist in Alpha Centauri or wherever as it is to the terrestrial physicist. In fact, trying to get into communication with extraterrestrials would involve sending such numbers as 1836. This would of course depend on sending clues to an arithmetical notation. '. . + . . . = ...' and things like

that would enable them to guess what '+' and '=' mean. We could also give them a clue to our decimal notation by sending such things as '7 + 5 = 12' (with, say, dot notations for 7, 5, 1 and 2). Now if the extraterrestrials received a piece of discourse containing '1836' they would guess that the discourse had something to do with protons and electrons. The pure numbers are of cosmic interest, unlike the impure numbers such as 12.5 kilograms, which are terrestrial and conventional. Sometimes the pure numbers are defined in more complicated ways, as with the fine structure constant, which determines the strength of electromagnetic interactions relative to those that explain the other fundamental forces of nature. The 'fine tuning' consists in the relative values of the fundamental constants of physics (constants determined in the end by pure numbers) being in certain ratios to one another. Slight differences in any of these ratios would lead to a universe very different from that which actually exists.[25]

In particular, life as we know it could not have emerged, and without life there could not have been observers. This has led to some curious reasoning in connection with the so-called 'Anthropic Principle' in cosmology. For the moment I shall ignore the possibility of life as we *don't* know it, for example in an environment of ammonia instead of oxygen, or life that is silicon-based (instead of carbon-based), or life in a dust cloud, such as in Fred Hoyle's science fiction novel *The Black Cloud*.[26] Now, the proposition that the universe we observe is such as to contain observers is as it stands tautologous and utterly uninformative. What is informative comes from propositions about the fine tuning which seems to be necessary for the universe to allow for the evolution of galaxies, stars, planets, life, and ultimately observers and theoreticians. The tautologous proposition obviously cannot explain anything but it can draw our attention to interesting facts. If we could show that galaxies, stars, planets, carbon-based life and observers could not exist unless certain relations held between the fundamental constants of physics, we could deduce that these relations *do* exist. Initially, however, the facts about the 'fine tuning' are known independently, and then we see how necessary they are for a universe like ours, and hence for us to be here to know it. Much of it is necessary for there to be, say, stars. So there could be a 'stellar' principle no less than an 'anthropic' one. Also there may possibly be intelligent beings very different from us humans all over the universe, on planets of distant stars. Indeed Brandon Carter, who introduced the term 'Anthropic Principle', has, I think, come to dislike the choice of terminology.

Does the fact that if it were not for the fine tuning we would not be here to know it explain the fine tuning, as some incautious purveyors of the anthropic principle have at least seemed to suggest? Surely not. It is the fine tuning that (partially) explains the existence of observers, not the existence of observers that explains the fine tuning.

Faulty Anthropic Arguments

The matter many be illustrated by a faulty argument of G.J. Whitrow in the appendix to the second edition of a book published in 1959[27] and earlier in a paper in *The British Journal for the Philosophy of Science*.[28] This was some time before Brandon Carter formulated his 'anthropic cosmological principle', and there is some similarity between Whitrow's reasoning and Carter's, and yet an important difference. Carter's reasoning was not faulty in the way (as I shall show) Whitrow's was. This is because Carter connected his anthropic principle with a 'many universe' hypothesis which I shall discuss shortly.

Whitrow begins by assuming plausibly enough that in a space of $s + 1$ dimensions there would be an inverse sth power law of gravitational attraction. (This is the case in Newtonian dynamics and is approximately true in general relativity.) Whitrow also assumes, perhaps plausibly, that life, and hence observers, would not have arisen on a planet which had a very eccentric or unstable orbit. He then goes on to make use of a theorem in classical mechanics that a stable and near circular orbit can occur only in a space of either two or three dimensions. He makes use of an argument to the effect that a brain would not be possible in two-dimensional space: only in a space of three or more dimensions could many neurons be connected in very many ways so as to form a complicated network. (Whitrow acknowledges a suggestion by J.B.S. Haldane and a mathematical discussion with M.C. Austin.) Whitrow thus concludes that 'the number of dimensions of space is necessarily three, no more and no less, because it is the unique natural concomitant of the higher forms of terrestrial life, in particular of Man, *the formulator of the problem*' (Whitrow's italics).

Modern cosmologists play around with theories that space has ten or more dimensions and a complicated topology, but they still hold that macroscopically it has three dimensions and a Euclidean type of topology. (Compare the way in which an oil pipe hundreds of miles long would look like a straight line from far enough away in space, whereas looked at closely its surface is seen to be two-dimensional, with the topology of the surface of a cylinder.) That space has three dimensions at least macroscopically is good enough for Whitrow's argument and we can agree that it *does* follow from Whitrow's premisses, together with some uncontroversial mathematics, geometry, mechanics and natural history, that humans could not exist unless the number of dimensions of space was (macroscopically) three. Nevertheless, insofar as he put the argument as an *explanatory* one, it is quite preposterous. The supposed explanation is back to front.

Surely we should think that it is the three-dimensionality of space that explains the existence of habitable planets containing intelligent life. I do not think of 'explanation' as a very clear notion, and its use depends a good deal

on context. I mainly think of it in terms of coherence, of fitting the *explanandum* proposition into our web of belief,[29] but in a scientific or cosmological context at least we should explain the more particular by the more general, the parochial by the cosmic. Whitrow's argument does indeed establish connections between the three dimensions of space and the existence of intelligent life on earth. That space has three dimensions is shown to be a necessary but not sufficient condition of the existence of inhabitable planets and intelligent life.

Is it that explanations come from the giving of necessary conditions, not of sufficient conditions? This will not do, because sometimes it is a sufficient condition that is explanatory. Decapitation is a sufficient condition for the death of Charles I and is explanatory of it. It is not a necessary condition for his death, since he might have died in his bed or by shooting. A cause is sufficient for an effect (given constancy in our contextual assumptions about background states of affairs – e.g. putting a match to a fire causes it to flame, assuming the presence of oxygen, that the wood is not wet, etc.) but is not necessary (e.g. Charles I might have been simultaneously decapitated and shot through the heart).

These complications make it difficult to say clearly and precisely just *why* Whitrow's putative explanation of the three-dimensionality of space is back to front. I suspect that it is just a matter of the particularity of the suggested *explanans* and of the cosmic nature of the supposed *explanandum*. Let us consider an even more preposterous argument, also due to Whitrow. This is that if space had only two dimensions we could not have any alimentary canal, since we would be divided into two disconnected parts. However, is it not mad to say that space has more than two dimensions because we can eat, instead of saying that the cosmic fact that space has three dimensions is (in part) the explanation of why we can eat?

Brandon Carter who first formulated the anthropic cosmological principle (in fact both a 'weak' and a 'strong' version of it) did so in connection with the hypothesis that our universe is only one of a huge variety of universes, a 'world ensemble', in which the fundamental constants of nature, which seem so arbitrary to us, differ randomly from universe to universe.[30] Strictly speaking, of course, 'universe' should refer to everything that there is (perhaps excluding God if we talk of God creating the universe) and so could be taken to refer not to what we think of as our universe but to the ensemble of universes. However, I think that it will not be confusing if I use the word 'universe' ambiguously and rely on context to make it clear whether I am talking of one of the many members of the world ensemble or of the whole lot.

Carter's many universes hypothesis may be held to explain the fine tuning of our universe. If there is a sufficiently large number of universes with the

values of the fundamental constants randomly distributed between them, then it could be virtually certain that *some* universes would be such that galaxies, stars, planets, life and intelligence evolved within them. The anthropic principle allays surprise that we are in such a universe. Obviously as intelligent beings we must be in a universe that allows intelligence to arise. This explanation, depending as it does on the many universes hypothesis, does not have the back to front character of the example that we have recently been discussing. But how good is the world ensemble explanation?

An unattractive feature of the explanation is its apparent prodigality. We may be reminded of Ockham's razor, the principle that entities should not be multiplied beyond necessity. 'Necessity' is a bit strong: let us say, 'without more than compensating explanatory advantage'. Ontological parsimony must be balanced against explanatory power. If Carter's hypothesis really does explain the fine tuning of our universe, then perhaps it should be accepted. Simplicity and symmetry are features which make for a good explanatory theory or hypothesis. Now the random distribution of relations between the fundamental constants in the various universes which belong to the huge ensemble of universes restores a symmetry that is missing in our ordinary 'one universe' theory, with its antecedently improbable set of relations between the fundamental constants. A random distribution of the fundamental constants of nature presumably requires no explanation in the way that a particular and arbitrary looking set of such values would. There is a sort of symmetry in randomness.

John Leslie has told a 'firing squad' story that illustrates Carter's point.[31] Suppose that you are put for execution before a firing squad and to your surprise all the members of the squad, good shots though they are, all miss. You would be extremely surprised to be still alive. Suppose, however, that you knew that there were a billion people like you being executed by firing squad; you might calculate that it was quite probable that there would be a few lucky survivors, and so you must be one of them. You should feel surprised and fortunate, but there would not be the sort of puzzlement that you might feel if you had been the only candidate for execution. You would feel only the sort of surprise that the winner of a lottery might feel. In a practically possible case, of course, there could not be a billion other similar firing squads and victims and you would guess that the firing squad had some reason not to kill you, and this would be a sort of analogue of the design (theistic) explanation of the fine tuning. Leslie's considerations, however, do support the view that Carter's multiple universes hypothesis, or something very like it, could provide a non-theistic explanation of the fine tuning of our universe, as a serious rival to the theistic design explanation. If our universe were not one of the tiny proportion of fine tuned ones we would not be here to tell the tale. Similarly, if the man is missed by the firing squad he reflects that of course he must be one of the few to survive.

Some readers will react adversely to the moral drawn from the firing squad story and so also to the supposed explanatory value of Carter's many universes hypothesis. Why should your surprise at surviving the firing squad be allayed by the story of a billion other firing squads? Certainly with the real world it would not be: we know that there could not be a billion other firing squads on this small planet. My answer is that if we rule out the hypothesis that the firing squad had some reason for trying not to kill you, the question 'Why me?' is not a proper metaphysical question. Indeed I hold that all indexicals, such as 'you', 'I' and also tenses of verbs, should be expunged from metaphysical theory.[32] Compare Quine's 'canonical notation'.[33] We should try to see the world as much as possible *sub specie aeternitatis*, to use Spinoza's metaphor. Metaphysically 'Why me?' is not an appropriate question. It could in some cases be a sensible, but not metaphysical, question. The story assumed that the firing squads were hard-hearted and incorruptible. If the story is changed 'Why me?' might indeed have an answer, such as 'The captain of the firing squad is your wife's cousin'. Now the analogy with Carter's idea is quite lost. It is nearer to the design hypothesis: 'God arranged the fine tuning so that conscious life could evolve'.

Carter's many universes were supposed to be completely separate from one another. However, Carter's type of argument would work equally well if all the 'universes' were vast parts of one single space–time universe as in a theory proposed by Andrei Linde.[34] Linde's cosmological theory is like a theory suggested by A.H. Guth in 1980 in proposing an inflationary scenario.[35] Linde supposes that the universe expanded exponentially by a factor of something like $10^{1,000,000}$ from an almost point-like beginning to a size comparable to that of a football. In Linde's version of the inflationary story the inflation occurs before the hot big bang in standard cosmology. His theory solves certain problems to do with the flatness and smoothness of space in the early universe. So the motivation was not that of Carter's multiple universes theory, and so there is some independent justification for believing in many universes or sub-universes with random variations in the constants that relate the fundamental forces, which arose from a single proto-force by symmetry breaking. (For symmetry breaking, consider the analogy of a needle in classical mechanics, balanced in a vertical position on its point. There is symmetry about its axis, but the symmetry will be broken by the smallest perturbation, whereby the needle will fall so as to lie in some particular horizontal direction.)

According to Linde's theory what we think of as the universe is only one sub-universe among a huge number of them, like a crystal in a randomly oriented array of such things (as, say, in a metal). Our particular 'crystal', vast as it is, extending beyond the reach of the best telescopes, clearly has values of fundamental constants that are suitable for the evolution of galaxies, stars,

planets, life and intelligence. We are obviously *not* in one of the vastly more common 'crystals' or sub-universes that are not 'fine tuned' in this way.

I am of course not competent to assess or even properly understand Linde's theory. However, I have mentioned it as a possible way in which something like a 'many universes' theory could get some independent justification. But Carter's and Linde's theories both have the additional advantage of restoring symmetry in the large, Carter's in the world ensemble and Linde's in his total super-universe. This symmetry comes from that of randomness. (But not complete randomness. There are the symmetrical proto-laws, the unified force and scalar field, which by symmetry breaking crystallizes out into the different relations between the four fundamental forces.) This leads me on to a purely metaphysical supposition, that of a completely random universe, without laws or even proto-laws.

Here is the idea. Suppose that the universe was infinite and completely random in the large. Then our huge, apparently ordered universe could be just one infinitesimal part of a disordered whole. We would be living in a Humean world: we would have no reason to suppose that in the next micro-second everything around us would not go into a total chaos rather like a puff of smoke. We of course would do well to suppose that the pseudo-laws, the temporary apparent regularities, would continue to operate. If they do not then no matter – nothing we do matters. But if they do continue to operate it is as well that we plan according to them.

Is not this a chilling thought, that our huge and beautiful universe (as it seems to us) might be a mere speck, a mere infinitesimal random fluctuation into apparent orderliness in what is really an infinite chaos? The image of a monkey typing randomly on a typewriter to produce Shakespeare's *Hamlet* would pale into insignificance beside the awful reality. Carter's and Linde's hypotheses do not quite have the chilling quality of this hypothesis but it is still true that they lack some of the emotional appeal of the design hypothesis. Still, emotional appeal is not proof or rational persuasiveness, and so it is time now to turn to theistic explanations of the 'fine tuning' and to examine their credentials as an argument for the existence of God.

6 The Argument from the Appearance of Design

Contemplating the beautiful laws of nature, many physicists have quite understandably taken them as evidence of design, and, as has been noted above, the apparent 'fine tuning' of the fundamental constants of nature has lent additional weight to this way of looking at things. It should be clear of course that this talk of 'fine tuning' is not to be taken as by itself implying a fine tuner: if so the argument would become both quick and circular. This

argument from ostensible fine tuning is the currently fashionable form of the traditional 'teleological argument' for the existence of God. Sometimes this is called 'the argument from design' but this, like a too literal construal of 'fine tuning', would be question begging. Years ago Norman Kemp Smith suggested that the argument should be called 'the argument to design'.[36] Equally we could call it 'the argument from apparent design', or for brevity 'the design argument'.

Unlike some other traditional arguments for the existence of God the design argument was never meant to be apodeictic. In contrast the ontological argument was meant to be quite *a priori* and the cosmological argument almost so, requiring only the assertion that something contingently exists. The design argument is best thought of as an argument to the best explanation, such as we use in science and everyday life. The best explanation for the appearance of design in the world is said to be a designer.

David Hume in his great posthumously published book, *Dialogues Concerning Natural Religion*,[37] obviously thought that there were alternative explanations which are as plausible as that of design. However, he retained a sceptical position, rather than a dogmatically atheist one. Philo, who was probably Hume's representative mouthpiece in the *Dialogues*, said that the universe might as well be compared to an organism as to an artefact, and organisms, *prima facie*, are not designed. They 'just grow'. (Antony Flew has commended the childlike acumen and common sense of Topsy in Harriet Beecher Stowe's *Uncle Tom's Cabin*.[38]) Of course we know from the modern synthesis of the theory of evolution by natural selection together with neo-Mendelian genetics that organisms do not need to have been designed. If we appreciate the huge time-scale of evolutionary processes and the opportunistic way in which they work, our minds need not be intellectually overwhelmed, even though perhaps imaginatively at a loss. However, I am here considering the argument from design in a post-Darwinian context, the new teleology not the old, in relation to the great appearance of design in the laws of physics.

As was just remarked, Hume held that the analogy between the universe and an organism was as good as that between the universe and an artefact. There are possibly many other analogies, equally good or bad. Indeed Hume's *Dialogues* concludes with Philo's concession to his main interlocutor Cleanthes that there is *some* analogy between the cause of the universe and a human mind. This is perhaps in one way a very small concession since with enough ingenuity one can find *some* analogy between almost any two things. However, in another way it is a big concession, namely that the universe does have a cause external to itself.

One trouble with the design argument is that there would have to be a 'cosmic blueprint'[39] in the mind of God. This conflicts with the supposition

that God could be a perfectly simple being. At first sight, as Hume seems to have thought, the designer of a universe would need to be at least as complex as the universe itself. It is not clear that this need be so. Complex forms of life evolve as a result of physical law together with the randomness characteristic of mutation and natural selection. Even repeated application of a fairly simple set of rules will allow for very complex but in the large regular patterns, as with the Mandelbrot set which is discussed in chaos theory. Does this mean that the designer of the universe could be *less* complex than the universe that is designed? Such a designer need not be the infinite creator God of the great theisms, at least. Nevertheless the designer's mind would have to have within it a structure at least as complex as the conjunction of fundamental laws and initial conditions. So the question surely arises: what designed the designer? The design hypothesis thus seems to raise more questions (and so is less explanatory) than the atheist one. (I shall reconsider this when I come to discuss John Leslie's conception of God as an ethical principle.[40]) Stephen Hawking has famously, or notoriously, looked forward to a simple 'theory of everything', which would give us knowledge of 'the mind of God'.[41] Of course if God's internal structure were that of the fundamental laws and initial conditions this would make Hawking's metaphor of 'the mind of God' appropriate. Nevertheless, the hypothesis of God, at least as designer, would be redundant, and belief in this sort of mind of God would collapse ontologically into atheism.

If the universe needed a designer which was not identical with the structure of the universe (i.e. laws and initial conditions) we would get into a regress, the designer needing a designer, and so on *ad infinitum*. One may be reminded of Fred Hoyle's fictional interstellar 'Black Cloud'.[42] Hoyle believed in an infinite steady state universe. If one asked where the (highly intelligent) black cloud came from the answer was supposed to be that it was designed by another black cloud, and this by yet another black cloud, and so on *ad infinitum*. Whether or not the cosmology was good (the steady state theory is in fact not generally accepted) the biology was unsatisfying. One expects a complex organism, even a 'black cloud', to have evolved from simpler organisms and ultimately from inorganic life.

Artefacts do not evolve in this way, though it is possible that one day self-replicating robots with occasional random variations in their programming may mimic biological evolution. An engineer designing an apparatus may produce a blueprint. Any complexity in the apparatus will then appear in the blueprint. (If we neglect complexity antecedently inherent in the components, such as transistors, which are the original materials for the engineer's design.) Here I am taking 'apparatus' in the sense of 'hardware'. One may be reminded of Descartes' rather obscure dictum that there must be as much reality in the cause as there is in the effect.[43] (Descartes used the principle in an attempted

proof of the existence of God, but my reference to it has a different motivation.) There can be a simple recipe for creating complexity, so long as one does not want to predict the particular *type* of complexity. Illuminate a planet rather like the Earth which is about a hundred million miles from a star rather like the Sun for so many hundreds of millions of years and (with luck) complex organisms, perhaps like elephants or mermaids, will eventually evolve. Still, this is not like the case of designing the universe itself – designing the fundamental laws and boundary conditions. For this there would have to be something like a blueprint in the mind of the designer, and it would have to have a complexity equal to that of a complete specification of laws and boundary conditions. Or can a regional order arise spontaneously out of a universal chaos, the chilling thought of a few pages back? But if we accepted this last idea there would be no need to suppose a designer, or anything else for that matter.

Thus, even if it were supposed that the designer determines only the laws of nature (with non-arbitrary constants in them) and a suitable set of initial conditions, then considerations of simplicity and of Ockham's razor suggest that the supposition was an unnecessary one which should be rejected. Any complexity in the laws and initial conditions would be duplicated in the mind of the designer. (Otherwise I could get no purchase on the notion of design that is involved.)

The matter may take on a different complexion if we look at the apparent arbitrariness of the fundamental constants of nature, as we at present understand them, and the way in which the relations between them are peculiarly fitted for the evolution of a universe which contains life, consciousness and intelligence. There is an appearance of a cosmic purpose which may appeal to someone who concedes the points made in the previous paragraph. It is tempting to think that the arbitrary constants must have been chosen by some purposive agent so as to make the universe conducive to the evolution of galaxies, stars, planets and eventually conscious and intelligent life.

At any rate this purposive explanation of the happy values of the constants of nature and of the forms of the fundamental laws could strengthen belief in a deity whose existence was made probable by some other argument. Of course the view that God designed the universe because he wanted conscious beings in it who would be the objects of his love is a not unfamiliar theological one. I have wondered whether this view could have a touch in it of psychocentric hubris. (I say 'psychocentric' not 'anthropocentric' in view of the possibility that conscious and intelligent life is scattered throughout the universe.) Certainly the Judaeo-Christian tradition sets a high value on humans in the scheme of things, and this value should also be ascribed to minds on other worlds, some of which may indeed be far superior to our human ones. Perhaps there is a bit of human vanity involved in the idea that the universe

was created in order for there to be consciousness and intelligence. Bertrand Russell held that vanity is a prime motive for religious belief. Even the horrible view that there is a hell to which the infinite God will consign us for our sins may give us an admittedly miserable sense of importance. Belief in highly superior beings on distant planets may be a blow to our hubris. Of course religious belief in the existence of angels may have had a similar effect,[44] even though in the nineteenth century angels came to be thought of as rather pale creatures, whose main talent was playing the harp. (There did not seem to be reports of super-Einsteins among them.)

Still we should not put too high a value on intelligence. Nor should we forget the sufferings of the non-human animals on earth. As Jeremy Bentham said, 'The question is not "Can they reason?" or "Can they talk?" but "Can they suffer?"'.[45] To see suffering is a corrective to disparagement of a possible 'psychocentrism'. It would be inconsistent of me to object to psychocentrism while at the same time taking seriously – as surely one must – the importance of human and animal suffering when I come to discuss the problem of evil.

Even so, the hypothesis that God designed this huge material universe so as to produce consciousness seems to be *ad hoc*. What a long-winded and chancy way of creating conscious beings. Surely an omnipotent being could have created happy spirits directly, rather than a universe which might produce entities like us, or higher than us, as a result of long and chancy evolutionary processes (see p. 29).

The possibility that the universe contains vast numbers of (and if the universe is infinite, which is of course questionable, infinitely many) stars like our sun, with planets suitable for evolution of life and ultimately intelligent beings, raises interesting theological problems, which have, with some exceptions, been neglected by theologians. Christianity appears to be anthropocentric in its doctrine of the incarnation, that God became man. To avoid this anthropocentrism we should envisage the possibility of incarnations on other worlds throughout the universe, a question to which, with a few exceptions, theologians seem to me to have given insufficient attention.

The new teleology, as I have said, is quite different from that associated with such as Paley. It concentrates on the awe and wonder at the beauties of the laws of physics and the starry heavens above. In its most recent form it focuses on the apparent 'fine tuning', the happy coincidences of the value of the fundamental constants. The ontological extravagance of postulating 'a Designer' could be outweighed by its value in explaining these coincidences. However, in assessing the plausibility of such a hypothesis we might also consider the possibility of there being an as yet unknown physical or cosmological hypothesis which might have as its consequence these arbitrary looking values. This would also provide an alternative to the 'many universes' hypotheses.

As a possibly misleading analogy consider the way in which three at first sight unrelated numbers, i the square root of minus one, π the ratio of a Euclidean circle to its diameter and the Euler number e should be related by the simple formula $e^{i\pi} = -1$. Once one knows the proof it becomes almost obvious, though still beautiful. Could the fine tuning one day be deduced from some simple laws, the constants in which do not have an arbitrary appearance? The trouble is that the ratios of the fundamental constants do not look mathematically significant, as do i, e and π. This consideration of a possible theory to explain the fine tuning is more parsimonious than the design hypothesis and than the many universes hypotheses. It partakes, however, of an appearance of wishful thinking, 'something may turn up', to which a theist could rightly object. Furthermore, since i, e and π are all mathematically significant (π can indeed be defined analytically, without geometry) they could be expected, antecedently of the proof, to be related somehow, even if not so beautifully. One trouble with the fine tuning is that the constants involved do not have importance in pure mathematics, and this does support the design hypothesis. There are pros and cons in this part of the debate.

7 God as an Ethical Principle

I now pass on to another concept of God, namely that of God as an ethical principle, namely that value ought to come into existence. This view has been much canvassed by John Leslie, who traces it back to neo-Platonism and indeed back to Plato's Form of the Good itself in the *Republic*.[46] Leslie calls the theory 'extreme axiarchism'. Leslie thinks of 'ought' in ordinary ethical talk as signifying a sort of 'requiredness', which is plausible enough. Unfortunately we often do not do what we think that we ought to do, and so the ethical requiredness in question does not ensure the occurrence of the required act. Still, thinking analogically, Leslie thinks of the axiarchic principle as one which explains the existence and nature of the universe.

The axiarchic principle seems too abstract to account for the details of existence. If God is an axiarchic principle is there anything comparable to a blueprint? Surely not. Simplicity is a virtue in an explanatory posit, but if it is too simple it cannot do the job. The theory also runs up against the problem that disvalue (evils) comes into existence. Another problem arises from the fact that Leslie sees value only in consciousness: a stone or a star cannot have intrinsic value. At first sight one would expect, on the axiarchic principle, that the world would not contain anything other than pure minds. I myself do not believe in pure immaterial processes: I contingently identify conscious states and processes with brain states and processes, but I would say that pure minds are logically *possible*, and would have expected that if the

axiarchic hypothesis were true the world would have consisted entirely of these. In his *Value and Existence*, therefore, Leslie struggles with a form of phenomenalism according to which stars and rocks, electrons and black holes, are merely *possible* entities: the world is *as if* they exist. In correspondence Leslie has said that when in phenomenalist mood he is as if he believes just in part of an eggshell, whereas the realist about the cosmos believes in the whole eggshell. He holds that the structure of the part is carried over to the structure of the merely possible whole: the axiarchic principle gives to consciousness the patterns which it would have if it were integrated with the non-conscious cosmos in which the realist believes. Leslie's phenomenalism (if that is what it is) is derived from his axiarchism: it does not depend on the usual bad arguments on which phenomenalists have usually relied (or on which Berkeley relied).

For those, such as myself, who believe that the best explanation of the higgledy-piggledy regularities (or non-regularities) on the observational level is the real *actual* existence of the physical objects postulated by science (and also those implicit in common sense) any sort of phenomenalism is unbelievable. I concede that if one *already* had firm reasons for believing in the axiarchic principle one might have *some* reason for believing in some sort of phenomenalism, but even so it would seem odd that God, or the axiarchic principle, should go about things in such an extravagantly roundabout way, even though it was only an 'as if' way.

The theory of extreme axiarchism has something in common with the more usual argument to design. It has an additional and attractive feature, namely that it purports to account not only for the general features of the universe (the cosmological fine tuning as necessary also for the existence of consciousness, the bearer of value) but also for the very existence of the universe. In this it has something in common with the traditional cosmological argument for the existence of God which I shall discuss in a later section. In this section, however, I shall treat Leslie's axiarchic principle mainly in its capacity as a putative explanation of the apparent design of the world, as an answer to the question 'Why is the world as it is?' rather than to the question 'Why is there anything at all?'

Further Difficulties for Extreme Axiarchism

As I have remarked, if Leslie's hypothesis did all that he claims, it could be intellectually an immensely attractive one. It would explain not only the appearance of design in the world but would explain the very existence of the universe, though perhaps not its own existence. The hypothesis has the advantage of at least the appearance of *simplicity*. It can be stated in a few words. It may be attractive to religious believers who are dissatisfied with too

anthropomorphic a concept of God. Plato seems to have had something like a religious attitude to his supposed Form of the Good. Of course Christians typically believe that God is a *person* who can hear and answer prayers. Well, 'religion' is what Wittgenstein called a 'family resemblance' concept.[47] A family resemblance concept is one that (roughly speaking) corresponds to a set of properties, such that we take the word for the concept to apply to something to which a fair number of the properties apply. There need be no necessary and sufficient set of these properties.[48] Thus believing in God is not necessary: consider Theravāda Buddhism. Priesthood and ritual are not necessary: consider Quakerism. Maoism is a borderline case: it had something like a priesthood, a sacred book and a creed. Thus it had some properties that make it not too foolish for us to count it as a religion. Perhaps 'Christian' is a family resemblance concept too. After all, there have been what seem to me to be atheist Anglican clergymen and theologians who call themselves 'Christians'.

Is it appropriate to say that a person who believes that God is an axiarchic principle is a Christian, or even a theist? I gather that there are indeed Catholic theologians who hold that Leslie's sort of neo-Platonism is compatible with the notion of God as a person. They can rely on the doctrine of analogical predication which is to be found in the writings of Thomas Aquinas.[49] The idea is that when we apply a predicate to God we do not do so in quite the same sense as we do when we apply it to humans, but nor do we apply it quite in a different sense. There is an analogy between the two uses. So perhaps in an analogical sense an ethical principle can be a person. I myself think that this must be stretching the notion of analogical predication too far. After all it is plausible to suppose that if you stretch analogy enough you can find analogy between any two things. Consider the number 19 and the making of canoes. They have something in common, namely the property of being liked by the headmaster of my school when I was a small boy.

Still, for us metaphysicians the important question is not whether Leslie's hypothesis of God as an ethical principle is compatible with traditional Christian theology. It is whether it is a plausible metaphysical hypothesis. Despite its attractions of simplicity and of being nonanthropomorphic, there seem to be three main objections to it. The first is that good though simplicity may be in a hypothesis, extreme axiarchism is *too* simple to do the job. The second has to do with the problem of evil, which I shall consider in more detail in a later section. The third has to do with the nature of ethics.

(1) We do indeed expect fundamental physical theories to be simple, symmetrical and beautiful. Fortunately our expectations have been satisfied to a great extent, an extent which we had no logical right to expect. Perhaps a simple law might connect with a simple state of the universe at the time it came into existence but with random perturbations and symmetry breaking

leading to the complex world that we know. But wouldn't this be an odd way of bringing about value? Would one not expect the axiarchic principle to bring about *directly* a universe of (say) Cartesian immaterial and happy souls? Mind you, the souls would not have all that Leslie and I value. He likes rock climbing and I like bush walking. Souls cannot do these. Whether or not having the illusion of doing these things would do is another matter – there would still be a good deal of indirectness in what comes from the axiarchic principle. In any case the happy souls might have only intellectual pleasures.

(2) Would one expect Leslie's axiarchic principle to bring about a universe in which *evil* exists? (It is clear that we should understand the statement of the principle to be glossed as 'the principle that *positive* value comes into existence'.) One of Leslie's replies is that 'it is no easy matter to bring about ethical requirements in consistent sets'.[50] This indicates that Leslie's apparently simple concept of God as an ethical principle must conceal a great deal of complexity. Part of the complexity might lie in the need for ethical sub-principles saying what sorts of things have value. Sub-principles may conflict, and then there must be a trade off. These sub-principles might be propositions about what means bring about what ends. So Leslie's apparently simple ethical principle does seem to conceal a lot of complexity of the sort that traditional theologians have associated with God's omniscience. If Leslie's principle corresponded only to God *qua* designer, then this complexity and perhaps the existence of evil could be put down to the recalcitrance of the material with which he had to work. But then there would be a lot that the principle could not explain. Or does the designer merely work on proto-laws determining only the values of the fundamental constants that emerge after symmetry breaking? This might conflict with the idea of God as not only designer but also Creator.

(3) The theory of extreme axiarchism depends on an objectivist theory about the nature of ethical judgements and speech acts. In the space available here it will of course be impossible to do proper justice to such theories.[51] First of all we may note theories such as those of G.E. Moore in his *Principia Ethica*[52] and W.D. Ross in his *Foundations of Ethics*.[53] According to this sort of theory the mind has an ability to intuit that things or events that possess certain 'natural' properties or relations (such as being pleasant or being an instance of truth telling) also possess 'non-natural' properties or relations (such as goodness or rightness). Such intuitions would be of synthetic *a priori* truths about the world, which supervene on purely natural facts. According to this view ethical judgements would be about objective facts, and this sort of theory would seem at first sight to be required if we are to believe in Leslie's axiarchic principle. The Moore–Ross theory fails to explain the motivating power of ethical belief. Furthermore, the intellectual intuition of non-natural properties and their relations is mysterious and incompatible

with a neurophysiological account of the mind. The intuition of goodness or rightness would not be at all like vision, where we have a theory of photons striking the eye and thus affecting the nervous system. However, Leslie differs from Moore and Ross because he denies that we intuit or *know* facts about goodness and rightness. We believe the axiarchic principle because we conjecture it, and part of our conjecture is that it is certainly effective and explains the existence and design of the world. Leslie draws an analogy between ethical and causal requiredness. He holds that the ethical uses of words such as 'must', 'have to', 'are required to', have 'more than punning similarities' to their causal uses. In this way Leslie thinks that his theory of ethics can be objectivist without requiring the postulation of mysterious ethical intuitions. He also thinks that the analogy between ethical and causal requirements overcomes the already mentioned problem for objectivists of the sort of Moore and Ross, that you might intuit that an action is good or right while feeling no motive to do it. So perhaps Leslie's own brand of objectivism about the ethical principle overcomes the main objections to non-naturalistic ethics such as that of Moore and Ross.

Leslie's principle, then, is conjectural, something like a scientific hypothesis, and accepted by argument to the best explanation. But is it the best explanation or even a good explanation? We may accept that there is some analogy between the 'must' of ethics and the 'must' of causal law statements, but there is much disanalogy too. It is notorious that 'ought' does not imply 'is'. If it did the world would be a better place. Leslie would reply that, despite appearances to the contrary, the world is the best that is logically possible granted the value of free will, and in the case of natural evils, granted the fact that 'satisfaction of all ethical requirements simultaneously may well be logically impossible' (ibid., pp. 82–3). He acknowledges that we have no reason to *like* this fact. Seeing a child in pain we need not comfort ourselves with cosy Panglossian optimism. Here of course we are in the midst of theodicy and 'the problem of evil', which I shall discuss in a later section.

Thus the question 'Why is the universe as it is?' (e.g. 'Why the "fine tuning"?') is answered by 'Because it is good that it is'. This is nearer to being an answer to the question 'Why is the universe as it is?' than it is to the question 'Why does anything exist at all?' If the principle is to do the latter job it has antecedently (in a logical, not a temporal sense) to exist itself, and we are back to the 'Who made God?' type of problem. Perhaps it could be said that the axiarchic principle, like God, would be a necessary being. Whatever a principle is, perhaps a *proposition*, the question of whether a proposition is necessary truth must be distinguished from the question of whether the proposition exists. Do we need to postulate propositions? It is already doubtful in what sense the axiarchic principle expresses a necessary truth, and doubtful also whether the existence of such a proposition could itself be

necessary. Similar questions will be taken up in the next section, on the cosmological argument for the existence of God, the argument from the contingency of the world.

How could it be that 'It is good that the universe is as it is' *explains* 'The universe is as it is'? The latter statement does not follow from the first, and so there must be a hidden auxiliary premiss. Such a premiss could be 'Because there is an omnipotent being who desires that the world be good'. (On a non-cognitivist theory of ethical language according to which ultimate ethical principles are expressions of desire or attitude the extra premiss would reduce to 'Because there is an omnipotent being who desires that it is as it is'.) Such explanations bring us back to a more familiar type of theism.

Leslie's axiarchism presupposes an objectivist theory of ethics. If one is (as I am with inessential qualifications) some sort of non-cognitivist about ethical language, so that ultimate ethical principles are the expressions of an overriding attitude, then of course extreme axiarchism falls to the ground. So also with some contemporary objectivist theories according to which ultimate ethical properties are natural ones, though they are, as David Wiggins put it, 'lit up' by our emotive attitudes.[54] Certainly our innate attitudes may lead us to notice certain natural properties or combinations of properties. Thus it may perhaps be (I do not know whether it is) that we are innately programmed to notice snakes. It is, however, true that this sort of predisposition often leads to error, as when we take a stick or piece of rope to be a snake. In any case it seems to me that such a theory of ethics has at least some of the difficulties of both naturalism and emotivism. I doubt whether there is *any* plausible theory of ethics that will support Leslie's extreme axiarchism. For example, ethical subjectivism clearly will not do, nor does a theory based on what an impartial spectator would feel, or perhaps a view that the correct ethical principles are those on which impartial spectators would converge in attitude if they knew enough facts. (I myself am sceptical of the possibility of such convergence – consider the lack of rapport between, say, utilitarians and Kantian 'respect for persons' moralists.)

In any case it seems to me that considerations of sociobiology and of anthropology suggest the plausibility of some sort of subjectivist or non-cognitivist theory of the nature of ethics. There does seem to be a genetic basis for a limited altruism. There must be cultural influences too, and cultures also undergo a sort of natural selection which would favour a limited altruism. For example, tribes of people who looked after one another would do well against less altruistic ones. In addition we must not forget the activities of moral reformers with wider sympathies and universalistic bent who push ethics further into what Peter Singer has called 'the expanding circle'.[55] This anthropological and sociobiological way of looking at ethics seems to remove its transcendent appearance and makes less plausible the idea of a creative

ethical principle at the back of the universe. Still, Leslie's hypothesis cannot altogether be ruled out by these considerations, and I shall have another (brief) look at it at the end of the next section. There the prime focus will not be on design ('Why is the universe as it is?') but on existence ('Why is there anything at all?').

8 The Argument from Contingency

Why, then, is there anything at all? After all, a null universe is the simplest hypothesis. Of course there is a pragmatic paradox in so far as we assert or even entertain the null hypothesis. We must exist in order to assert or entertain the hypothesis and the proposition that the universe is null has to exist in order to be asserted or entertained. Nevertheless the paradox is pragmatic only, and logic does not rule out the empty universe, except for a technicality. In classical first order logic the valid schemata are defined as those that come out true in any non-empty universe. This is for technical convenience, and testing for validity in the empty universe can be done separately, easily and mechanically.[56]

Given that the null universe would be the simplest possible, is it not a matter for great awe that there is anything at all, let alone our vast and complex universe? Despite the fact that I am repelled by Heidegger's style of philosophical writing, there is nevertheless one respect in which I have a sneaking fellow feeling with him. This is his propensity to ask why there is anything at all.[57] Wittgenstein also experienced this amazement that anything should exist at all.[58] In his *Tractatus*[59] he said, 'It is not *how* things are in the world that is mystical, but *that* it exists' (6.44). Admittedly Wittgenstein seems to contradict himself in his next proposition 6.45 where he talks of the mystical as seeing the world as a limited whole, which is surely a matter of *how* it is, rather than *that* it is. No doubt there are grades of mysticality!

One way in which the question 'Why is there anything at all?' is quintessentially mystical is that it apparently has no possibility of an answer. Whatever answered it would have to be something in the world, or else something other than the world, and the question would just reappear over the existence of that other entity. However, we must not go too fast in ruling out all possibility of an answer. Some have sought the answer in the concept of a being whose existence is *necessary*. I shall conclude that indeed no answer on these lines is satisfactory, but nevertheless it is far from my purpose to dissuade anyone, including myself, from asking the unanswerable question. I do think that there is something ultimately mysterious in the fact that the universe exists at all, and that there is something wrong with us if we do not feel this mystery.

As I have just hinted, there has of course been a traditional theistic answer to the question. This is that the universe exists because God created it. The trouble here is that 'universe' must be taken to mean something less than 'everything that there is' (including Carter's many universes, supposing that they exist). There is still the question of God's existence. The usual theistic answer is that God *necessarily* exists, and so there is no need for explanation of his existence. A necessary being is one which just *has* to exist. Or, to put the matter more perspicuously, to say that God necessarily exists is to say that the proposition 'God exists' is a necessary truth.

The Ontological Argument

In this connection it will be instructive to have a quick look at the so-called 'Ontological Argument' for the existence of God, put forward in slightly different forms by Anselm and Descartes. A careful and scholarly discussion of Anselm's and Descartes' forms of the ontological argument may be found in Jonathan Barnes's book *The Ontological Argument*,[60] but here I shall confine myself to what I consider to be the bare bones of the argument. Anselm and Descartes both thought of God as a being no greater than which can be conceived, i.e. a being with all possible perfections. They then thought that existence was itself a perfection, that an existent God is more perfect than a non-existent one, and thence, they thought, it is absurd to deny that God exists. We cannot, that is, have a consistent conception of a non-existent God.

Is 'God' a proper name? Bertrand Russell would have said that it is a description, i.e. equivalent to something such as 'the omnipotent, omniscient and benevolent being'. More exactly, 'God exists' would come out 'There is an *x* such that for any *y*, *y* is an OOB if and only if *x* is identical with y', or in symbols '$(\exists x)\ (y)\ (\mathrm{OOB}y \equiv x = y)$'. The symbols are in fact clearer than the ordinary language version, because of the 'there is an *x*' which is *not* like 'there is a lion' or 'lion *x*': '*x*' is a variable, whose use is for cross reference, not a predicate. But for the need for cross reference we could just have said 'something'. Thus we could say 'something runs' instead of '$(\exists x)$ runs *x*'.

The '*is*' in 'God is wise' signifies neither existence nor identity. It is a grammatical quirk, and we can mimic logical notation by writing 'God is wise' as 'Wise (God)'. On the other hand, 'God exists' comes out as '$(\exists x)$ God *x*'. While we must treat 'God' as a name in 'Wise (God)' we must treat it as a predicate in '$(\exists x)$ God *x*'. (E.g. '$(\exists x)$ omnipotent *x*. omniscient *x*. benevolent *x*.') The difficulty is clear. In formal logic when names are allowed we can deduce '$(\exists x)\mathrm{F}x$' from '$\mathrm{F}a$' where '*a*' is a name. The assumption is that names always name something.

We can hardly deduce '$(\exists x)$ strong *x*' from 'Zeus is strong' because 'Zeus' names nothing. (We could deduce 'someone smokes a pipe' from 'Sherlock

Holmes smokes a pipe' but that is within the context of fiction, in which there is a pretence on the part of Conan Doyle and his readers that 'Sherlock Holmes' does successfully name something.) If we are in doubt whether or not God exists we should treat the word 'God' as a predicate, as in 'the one and only *x* such that *x* gods'. (To god might be to be omnipotent, omniscient and benevolent.[61])

It is true that we could use a non-standard logic such that names such as 'Zeus' are allowed. In such a logic 'exists' could occur as a predicate. In such a logic quantification ('for all *x*' and 'there is an *x*') would be what is called 'substitutional'. According to this '$(\exists x)Fx$' is true if for some name '*a*' the sentence 'Fa' is true. Here there is no commitment to existence since '*a*' might be, say, 'Sherlock Holmes'. Contrast the (standard) 'objectual' quantification, where '$(\exists x)Fx$' is true only if 'Fx' is true of (or 'satisfied by') something. The usual objection to substitutional quantification is that we get into trouble with 'all rabbits' or 'some rabbits' since we do not have names for all the rabbits. (And if we replace 'rabbits' by 'real numbers' it is even worse, since it is mathematically impossible to have names for all real numbers. It is impossible for finite sequences of symbols to be in one–one correlation with the real numbers.)

It should be noted that in logic '$(\exists x)$' or 'there is a' must be understood as tenseless. We could also take 'exists' as tenseless, too, and replace some such idiom as 'The old town hall no longer exists' by 'The old town hall exists (tenseless) earlier than now'. We put tenses into the predicate and keep 'There is a' as tenseless. In what follows I shall use 'exists' as tenseless.

Still, allowing substitutional quantification, we could deal easily with such a sentence as (to use an example of Jonathan Barnes's) '$(\exists x)$ (Socrates vowed a cock to *x*') which is true (substitutionally) because it comes out true when 'Asclepius' is substituted for '*x*'.[62] (In standard logic, with objectual quantification, we would deal with the case differently, as perhaps 'Socrates vowed-true of himself "gives a cock to Asclepius"'. Here there is no reference to Asclepius, only the name 'Asclepius', as the quotation marks indicate.)

If we allow substitutional quantification 'exists' could be a predicate in 'God exists'. Even then the ontological argument does not work. We might have the concept of a perfect being, and include 'exists', understood substitutionally, as a predicate contributing to this concept. Nevertheless there would still be the question of whether this concept is true of or applies to anything. Note that 'applies to anything' brings us back to objectual quantification. The ontological argument thus understood is circular and assumes what it sets out to prove.

Barnes tries to show that 'there is a' and 'exist' are not equivalent. Some of his examples involve intensional contexts, as with 'The agents he named under torture were found not to exist'. There are special problems here.

I would point out that there weren't any agents that he named, and so 'he named' is not like 'he kicked'. If he kicked any agents there were agents who were kicked. I think that by going metalinguistic one can probably bend these intensional contents into extensional ones, much as one can 'he desired a unicorn' which can be bent into the form 'he desired-true of himself "possesses a unicorn"'.[63]

The upshot of all these considerations is that the ontological argument for the existence of God does not work, which is as much as to say that there is no logical contradiction in denying that God exists. If so the argument from contingency cannot be valid if it is construed as arguing for the existence of a *logically* necessary being.

Not only is the ontological argument invalid, but if its contention that there is a logical contradiction in denying the existence of God were true then the assertion of the existence of God would be trivial. Thus '$p \vee$ not-p' tells us nothing about the world and '$(\exists x)Fx \vee \sim(\exists x)Fx$' only that something exists, which we know already.

The Cosmological Argument

We need some suitable sense of 'necessary' other than that of logical necessity, and we need a meaty premiss. The premiss of the argument from the contingency of the world (often called the cosmological argument) is that something exists and that it might not have existed. Now if the argument were a purely deductive one it would obviously be fallacious. The premiss by itself has no interesting logical consequences, certainly no consequences that an atheist cannot consistently accept. However, the argument seems to me best seen as what has come to be called 'argument to the best explanation'. Argument to the best explanation has come to be seen by many philosophers as the fundamental type of inductive argument in science, history and common sense.[64] For example, a detective will make several possible hypotheses about who is the murderer, and will choose the one which gives the best explanation of the footprint in the rose bed, the open window, the unusual demeanour of the butler and so on. The argument from contingency depends on the idea that the best explanation of the existence of contingent beings is the existence of a necessary being. In fact it is held to be the only ultimately satisfactory explanation. The argument was put forward by Thomas Aquinas as the third of his 'Five Ways'.[65] In recent times the argument has been very well put by F.C. Copleston in a discussion with Bertrand Russell.[66] It is the argument most relied upon by modern Thomists.

Copleston reminds us that there are in the world contingent beings. Hence the universe must have a reason for its existence that is external to it. If this thing is itself contingent, the reason for *its* existence would have to be

outside *it* also. If we proceed in an infinite regress in this way we are left with an infinity of things which in aggregate still does not contain the reason for its existence. Hence, Copleston argues, the explanation for the existence of the universe must lie in some being 'which contains within itself the reason for its own existence', which *necessarily* exists.

Russell thinks that it is legitimate to ask why any particular event occurs by giving its cause, and so on back indefinitely, but that it is illegitimate to ask for an explanation of the whole infinite chain. This would indeed be so if all explanations had to be in terms of cause and effect, but Copleston reasonably asks why it is illegitimate to ask for an explanation of the whole chain. Such an explanation cannot be causal, but why should all explanations be causal? Could the existence of the universe as a space–time whole be explained by an atemporal necessary being not itself in space or time?

A theologian, such as Aquinas at his best, need not be worried about whether there was a first moment of time, at which God created the universe just before the cosmic 'big bang'. The universe might be finite in earlier time (as cosmologists believe) and yet have no first moment. Time might be like the set of real numbers greater than zero, of which there is no first number, or even like the positive fractions . . . $1/32$, $1/16$, $1/8$, $1/4$, $1/2$, 1, 2, . . . Of course cosmologists believe that in fact there is a much more sophisticated story to be told about time, or rather space–time. The illustration is simply to show how time could be finite towards the past, and yet there could be no first moment. In the sort of model of the tiny compressed space–time with which the universe began (less than 10^{-33} cm radius) that James Hartle and Stephen Hawking have produced, time-like world lines get bent into space-like directions, and even if each *did* have a first moment there would be no unique such. In any case ordinary notions of space–time break down within such a singularity. Hawking has suggested that these considerations suggest that we do not need belief in a creator God.[67] Aquinas would have had an answer to this. Even if there were no first cause in a *temporal* sense, we would still want to seek an atemporal explanation of the whole *universe*, past and future, which would be in terms of an eternal God outside space and time.

Aquinas could have given a similar retort to the idea that the universe could have come into existence through a quantum fluctuation. The idea is now quite common, and there is talk of our universe spawning baby universes outside our own space–time, perhaps from 'black holes'. However, the idea was put forward earlier in a simple way by Edward P. Tryon.[68] According to Heisenberg's uncertainty principle the energy and time of a system cannot both be determinate. If ΔE is the uncertainty of the energy and Δt is the uncertainty of the time, $\Delta E \cdot \Delta t$ is of the order of magnitude of Planck's constant $\hbar$ and if energy is determinate t is infinitely indeterminate. So if the energy is zero or near zero an infinite or a long-lived universe could have

arisen. This could happen if the mass energy (which is positive) and the gravitational energy (which is negative) wholly or nearly cancel out, thus accounting for the coming into being of our universe from nothing at all. Tryon's idea is a very pretty one, but it does not answer the philosophical question 'Why should there be anything at all?' It assumes a structured space–time and the quantum field and also laws of nature (whatever these are). (For example, if laws of nature are regularities there must be the cosmos to exhibit the regularities.) Tryon's idea has evidently been developed in more sophisticated ways, but it seems to me that in much the same way they do not answer the philosophical question, nor come to grips with the idea of whether there must be an atemporal 'cause' for the whole caboodle of a space–time universe.

Are there Suitable Senses of 'a Necessary Being'?

So we are back to our question about whether the explanation of the existence of contingent beings could be, as Aquinas, Copleston and other theologians have thought, a necessary being. Is there a suitable sense of 'necessary'?

One suggestion is that God might be necessary in the sense of not being dependent on anything else for his existence. But then the atheist might say that the universe itself will fill this bill. On the atheist view the universe has nothing beyond itself and so cannot be dependent on anything else.[69] Moreover, if God is a necessary being only in this sense, his existence is no less contingent than is that of the universe as the atheist conceives it. So if this is the sense of 'necessary' in the argument from contingency of the world the argument must be a bad one.

Another suggestion is that 'God exists' might have the sort of necessity that 'There is a prime number between 20 and 24' has. This does *seem* to be a clear case of a necessary yet existential proposition. I think that this analogy between the necessary existence of numbers and that which it is supposed God has is the most promising avenue for the theist to pursue, and yet I can see that there may be problems with it. One problem is to get a grasp of the 'necessary' here. We have logical necessity, which is consistency in first order logic. Then there is physical necessity which includes also consistency with the laws of nature and perhaps also boundary conditions from cosmology. There is legal necessity, consistency with obeying the laws of the land. And so on. My own view, following Quine,[70] is that these forms of necessity, as well as many more mundane uses of 'necessary' or 'possible' or cognate words such as 'must', can be elucidated in a contextual way – as consistency in the sense of first order logic with contextually agreed background assumptions. (Those who believe in so-called 'analytic propositions' can throw them in with the background assumptions.)

Thus we say 'David must have arrived by now' when we can deduce his arrival from background knowledge of his desire to come, the length of the road, the speed of his car, and so on. This seems to account for ordinary language uses of 'must', 'necessary', 'possibly', etc. Modality is explained metalinguistically, nor do we need to go far up in the hierarchy of language, metalanguage, meta-metalanguage, etc. How often do we in real life iterate modalities or 'quantify into' modal contexts in the manner of modal logicians? I do not want to postulate possible worlds other than the actual world in the manner of David Lewis. This proliferation of possible worlds makes Carter's 'many universes' hypothesis look parsimonious by comparison. What Lewis calls 'ersatz possible worlds' are not so bad: I talk of them just as a way of referring to the contextually agreed background assumptions. The definition (some pages back) of logical necessity in terms of interpretability in any non-empty universe is not in conflict with my attitude here, because for this purpose universes can be defined in the universe of natural numbers, which we can take to be actual and not merely possible. (This is because of the Löwenheim–Skolem theorem.)

Now perhaps we can account for the sort of necessity that we feel about 'There is a prime number between 20 and 24'. The proposition is agreed to follow from unquestioned arithmetical laws, probably not Peano's axioms themselves, since most who believe that there is a prime number between 20 and 24 will not have heard of Peano's axioms. The axioms, Peano's or otherwise, may be regarded as necessary because they are so central to our system of beliefs, and anyway each is trivially, deducible from itself. They are not definitions, but come rather near to being definitional.

At any rate, the suggestion of mathematical necessity may give some justifiable comfort to the theist. How far this is the case depends on our philosophy of mathematics. It seems to me that there are about five fairly plausible yet not wholly satisfactory philosophies of mathematics in the field at present, and how we answer the point about necessary existence in mathematics will depend on which of these contending philosophies we accept or think of as the least improbable. Let us take a very brief look at these options. I shall in fact begin with what I regard as *not* an option but which has been very influential in the recent past.

Some Philosophies of Mathematics and their Bearing on Theism

Should we say, with Wittgenstein in his *Tractatus*, that the apparent necessity of mathematics arises from the fact (or supposed fact) that all mathematical propositions say the same thing, namely nothing? This would be a way in which mathematics seems to be removed from the chances and contingencies of the world, but it would not help the theist, because to say that God's

existence was necessary in this sense would be to say that the assertion that God existed would be completely empty. In the present context I could leave the matter here, since this philosophy of mathematics does not help the theist's search for insight into the way in which God might be said to be a necessary being. However, Quine has given reasons why the attempt to exhibit set theory (and hence mathematics) as logic should be rejected.[71] (1) Set theory, unlike propositional logic and first order predicate logic, is *incomplete*. No set of axioms will imply all its truths, though of course any truth will be implied by some set of axioms. Truth in mathematics cannot be identified with provability, still less with provability from some set of definitions or conventions. (2) Set theory, unlike logic, has a constant predicate 'is a member of'. (Logic normally includes the identity predicate, but this is a curious one and can be eliminated if we have a finite primitive vocabulary, which could if we liked include all the predicates in the *Oxford English Dictionary*.) (3) Set theory is Platonistic. There are assertions in it of the existence of sets (and so of numbers), which are not particular objects in space or time. These considerations all make the break between logic and set theory in the same place and answer Bertrand Russell's challenge to say where logic ends and mathematics begins.

The failure of logicism in mathematics should be congenial to the theist, in that the supposed necessity of existential statements in mathematics lives to fight another day as a candidate for shedding light on what God's necessary existence might be like. It should be welcomed by pure mathematicians who would not like to think that their life's work was concocting more and more recondite ways of saying nothing.

I now pass on briefly to some philosophies of mathematics which do seem to be the most plausible, even if not completely satisfying, and see how they might bear on the nature of God's necessary existence.

Quite attractive is Quine's form of Platonism. His Platonic objects are sets. In line with the pioneering work of Frege and of Whitehead and Russell he holds that set theoretical entities can do duty for all the entities postulated in classical mathematics. He points out that a physical theory contains mathematics and empirical physics seemingly inextricably intertwined with mathematics. Since theories are tested holistically, if we believe physics we must believe the mathematics needed for it. (Quine concedes that some pure mathematics may go beyond what is quite needed. This is especially true, of course, of the more esoteric reaches of set theory. This can be seen as 'rounding out' and might even be justified ontologically on the score of a sort of simplicity.) Thus we believe in mathematical objects by the ordinary hypothetico-deductive method of science: we believe in the entities postulated by the theory that is best explanatory of observations. Thus Quine's Platonism does not require talk of mysterious powers of direct intuition of

Platonic objects. (I see no reason why sophisticated robots might not apply the hypothetico-deductive method.) Quine's Platonism is thus not in conflict with modern mechanistic biology as traditional Platonism seems to be. It is possible that if the world (including space–time) had a discrete grain we could get by without the real numbers and with difference equations instead of differential equations. Thus there is *some* empirical constraint on the mathematics we need to postulate. Nevertheless because of the slack between hypothesis and observation mathematics is very much immune to revision, and this may give it a sort of necessity. However, this necessity would be epistemological, not ontological.

It should be conceded that the more traditional form of mathematical Platonism, according to which the mind has direct intuitive contact with the mathematical entities, is congenial to many mathematicians.[72] Roger Penrose has indeed used this supposed feature of mathematics to argue towards a new view of mentality and of how the brain works.[73] Diffidently, because Penrose after all is an eminent cosmologist and the son of a great neurobiologist, I go the other way. If Penrose's view is accepted it could give some comfort for the theist. It is just conceivable that the brain may need for its full understanding recondite quantum mechanical principles, such as of non-locality, but it seems to me that since neurons operate mainly electrochemically the brain is probably more like a computer or connection machine. Even with the recondite principles it is hard to be convinced that intuition of Platonic entities is possible for it.

Another philosophy of mathematics that is a leading contender in the field is the fictionalism of Hartry Field.[74] He holds that mathematics is a fiction: all its existential statements are false. The universal ones are true but vacuously so, since 'everything is such that' in this case is equivalent to 'it is not the case that something is not such that'. According to Field mathematics merely *facilitates* scientific inferences which could be carried out in a more complicated way nominalistically. (He makes use of space–time points of which there are as many as there are real numbers.) To show this in detail he needs to reconstruct physical theories nominalistically and has done so for certain theories.

Field's fictionalism would hardly appeal to the pure mathematician, who would not like to think of himself or herself as a sort of Dickens or Thackeray. (Or worse, since in novels there are many existential sentences which are not only pretended to be true but which are true!) Still, that's not an argument. Field's theory is ontologically parsimonious and is in that way appealing. It is a no nonsense sort of theory. One worry about really believing set theory, I think, is the fact that the set membership relation between a set and its members is *too* intimate: there is something mysterious about it.

If Field's theory is accepted, we must say that there are no true existential mathematical sentences, and *a fortiori* no necessary ones. So Field's theory does not help in the theist's possible hope that mathematical necessity throws some light on what God's necessary existence might be like.

One philosopher who has strongly felt the mysteriousness of the set membership relation is David Lewis, who in his *Parts of Classes*[75] treats the relation of set to subset as the whole/part relation. (Classically, of course, this is done by defining *subset* in terms of set membership.) However, the notion of set membership still obtrudes in one place, the singleton relation, the relation of a thing to the set of which it is the only member. In an appendix with John P. Burgess and A.P. Hazen (explaining two methods due to these logicians) he gets over this problem but at a certain cost of empirical assumption as to what is in the universe, and also of structuralism, where one talks indifferently about many different subject matters. He also needs plural quantification, which is familiar in ordinary language as in 'some critics admire only one another'. This sentence cannot be rendered into first order predicate logic without talking of sets of critics. George Boolos[76] gives the semantics in terms of second order logic, but Lewis cannot take this option because he is trying to replace set theory and he thinks of second order logic as 'set theory in sheep's clothing', as Quine has put it. (One trouble I have with structuralism is that I can think of a structure only in set theoretic terms.) Lewis's theory may be the philosophy of mathematics of the future, but because of its reliance (especially in the Appendix) on some general empirical assumptions about the world it does not provide the sort of sense of 'necessity' which might help the theist.

Properties may seem less mysterious than sets, because physicists postulate properties of mass, length, charge, spin, charm, colour (these words not to be taken in their ordinary sense!) and so on. We might take 'this has a mass of 2 kg' as expressing a relation between this, the standard kilogram, the property mass, and the number 2. Note that they are not the bad old properties to which Quine has objected, as if using the predicate 'tall' committed one to the property 'tallness'. No, they do not come from a bad philosophy of language and meaning, but from what science tells us. I am myself inclined only to believe in those properties which fundamental physics and cosmology need to postulate. This sort of scientific realism about universals was pioneered in Australia by D.M. Armstrong[77] and has led to various ideas in the philosophy of mathematics, as by Peter Forrest and Armstrong[78] (who have their differences) and most notably by John Bigelow in his book *The Reality of Number: A Physicalist's Philosophy of Mathematics*,[79] which needs to be taken very seriously. There are differences: Bigelow and Forrest believe in uninstantiated universals, Armstrong only in instantiated ones. But because of the empirical basis of these theories, it once again does not give any help to

the theist in the search for some analogue of God's necessity in that of mathematical existence.

Probably, therefore, the theist's best bet might after all be to try to defend the old fashioned form of mathematical Platonism, with its direct intuitions of a super-sensible reality (universals), which exist eternally and in some sense necessarily. If this sense of 'necessarily' could be made intelligible then God might be said to exist necessarily in this sense. We are led into obscurities and it is, as I have said, hard to fit Platonic intuitions into modern epistemology and neurobiology.

When all is said, however, it might be best for the theist to say simply 'God exists necessarily' in the way that the number 23 does. Would this be a sort of polytheism with many necessary beings? Or would 23 be somehow *part* of God? I leave this question to theologians. The atheist will feel well relieved of these intractable problems.

Eternity and Sempiternity

In discussing the cosmological argument I took it that Aquinas was at his best in thinking of God as eternal, in the sense of not being in time at all. In this way the existence of God would be said to explain the existence of the whole space–time world (as we think of it) without being an efficient cause at the first moment of the universe's existence, a concept which has no clear sense in modern cosmology. As I noted, the universe can have a finite past and yet have no unique first moment. Furthermore there is no unitary time. The special theory of relativity tells us that there is no preferred set of axes in Minkowski space. Still, perhaps a preferred set could be got by going outside the theory, e.g. in preferring space–time axes with respect to which the cosmic background radiation is equal in all directions. Even so, because of the expansion of the universe, these local times would lie in different space–time directions from galaxy to galaxy. Also time-like world lines get bent up in black holes (as at the beginning of the universe) and black holes may possibly spawn baby universes with their own different space–times. We should therefore be cautious about talking of God as in time, sempiternal not eternal. In *what* time would a sempiternal God be sempiternal in? These considerations reinforce, in my mind at least, the interpretation of God's eternity as atemporal rather than sempiternal. In what follows I shall use 'eternal' in this atemporal sense and shall contrast eternity with sempiternity.

William and Martha Kneale have explored the issue of eternity versus sempiternity in two scholarly and instructive papers.[80] They bring out the tensions in Aquinas's thought. On the one hand Aquinas had a classically inspired preference for the 'eternal' conception of God, which William Kneale traces back to Parmenides and Plato, but *not* to Aristotle, who was on the

'sempiternal' side. Kneale suggests that the 'eternal' conception was naturalized in Christian theology through Boethius. According to this conception God is outside time altogether. On the other hand there is talk of God as a living being and as performing actions. This suggests sempiternity. My difficulties about the notion of sempiternity make me wish to advise the theologian (I hope *without* being a devil's advocate) to go the 'eternity' way. How would an eternal being act on the world? Perhaps in this way: a certain relation between the atemporal God and a temporal act (say someone's prayer) is correlated with another relation, say between the atemporal God and a temporal state of grace or whatever. Some such answer might be given as to how John Leslie's axiarchic principle could act on the world or bring it into existence. There would be some sort of relation between an atemporal thing (as I conceive that an axiarchic principle, proposition or rule must be) and a space–time universe. One other problem with Leslie's idea of an axiarchic principle actually bringing the world into existence is analogous to those brought up a few pages back. This is that we can ask what explains the existence of the axiarchic principle. Leslie holds that the axiarchic principle is a necessary proposition, but need the existence of a necessary proposition itself be necessary? Perhaps it is if the existence of universals is necessary, but I have noted that this is at least controversial.

Once more the atheist may feel grateful for being excused from such conundrums, fascinating intellectual problems though they are.

9 The Argument from Religious Experience

With the argument from contingency philosophers and theologians were endeavouring to argue for a creator God, not merely a finite 'big brother' God. The latter would merely be a higher part of the universe though not immediately observable, which we can assist in the fight against evil.[81] The same might be said about the argument to design, even though strictly speaking this argues only for a designer who works on already existing material. Those who argue from religious experience could be arguing for the creator and designer God of the great monotheistic religions, though some might be arguing only for a 'big brother' God. Let us examine the argument.

The argument is that since many persons report that they have experiences as of acquaintance with God this raises the probability that God exists. Religious people usually talk of 'certainty', not of probability. This claim to certainty would not necessarily be conceded by an inquiring person who heard the reports. Such a person would be pleased with a mere raising of probability. However, William James considered the question of whether a believer's religious experience could give a good reason for his or her own religious

beliefs, even though this reason is not interpersonally persuasive. The believer may think that these experiences enable him or her to cope better with the problems of life, and perhaps become a better person. The idea that this may constitute an intellectually respectable *reason* for belief is connected with James's pragmatism, which assimilates the notion of truth to that of the useful or what works. I do not think that it is necessary nowadays to take up space in refuting this confused notion of truth. This is not, however, to say that we can totally ignore pragmatic considerations, as in the well-known matter of Pascal's Wager, which I shall consider shortly.

When people talk of religious 'experience', the word 'experience' tends to be somewhat protean in meaning. In the first place, they may be claiming that they have something like perception. However, there are clearly no special religious sensations as there are visual, auditory and tactual sensations. Nor do they correlate with interpersonally perceptible situations, as visual, auditory and tactual sensations do. Furthermore, in the last century or two there has come to be increasing physical and neurophysiological knowledge of how perception works. There is nothing like this in the case of religious experience, at least if this is thought of as a sort of spiritual perception. Do spiritual photons come from God to some neurophysiological organ? Perhaps this is an unfair question. God might be everywhere, even in the synapses of the brain, and in the previous section I have played with a notion of how an external (atemporal) being might be said to act on the world. Still, there does remain some difficulty in seeing sense perception as a fit model for the notion of religious experience.

Experience of God has sometimes been described as the feeling that there is a 'presence'. This feeling is not connected with a special perceptual sensation. Thus two explorers in the wilderness may say to one another that they feel that there is someone nearby whom they cannot see. In fact they know that no other explorer or native of the region is nearby. Nevertheless, I suppose, the feeling can be strong and shared interpersonally. A psychologist would put it down to an illusion brought on by loneliness and privation. Similarly a vague feeling of a Presence, such as some mystics have reported, need not be taken as veridical. If a person of mystical bent does take it as veridical, a sceptic need not accept the mystic's claim. The principle of theoretical economy favours the sceptic's explanation in terms of some sort of illusion. Not that the sceptic will convince the mystic. At the beginning of this essay I put forward scientific plausibility as a guide in metaphysics and the mystic will refuse to go all the way with this guide. There is thus likely to be deadlock here. At any rate I think that the sceptic can say this, that religious experience provides no *objective* warrant for religious belief unless the possibility of a naturalistic explanation of the experience can be ruled out as implausible, and it is hard to see how this requirement could be met.

There are all sorts of possible explanations of the numinous. Here is an example. I love the hills. Hills at the top of a glen can look a bit like huge crouching animals, and this may make us feel towards them as one would towards conscious beings, even though we know that they are solid rock and have no personality whatever. With this 'as if' feeling there can be one that I am inclined to describe as numinous. It presumably arises from some neurological harmoniousness that comes from the fact that the structure of our brains is largely that of our early prehistoric ancestors and so is adapted to surrounds of wilderness, or something like wilderness (even though the hills had been cleared for sheep). I do not put this forward as a serious piece of psychology, as a good explanation for the sort of case that I have in mind. I am neither a psychologist nor an anthropologist. It obviously will not do as a general explanation, since many mystics have hardly been hill persons or lovers of wilderness. I put it forward as a suggestion that naturalistic explanations of mystical experiences need not be too hard to come by. I do not want to decry the experiences: the experiences can certainly be valued, and as I said in an earlier section, contemplation of the laws of nature can certainly induce religious *emotions*, and these should be prized. As a philosopher I often wonder what it would be like to spend all one's life on practical and human-centred concerns, such as politics, economics, town planning, and all sorts of business, administrative and managerial activities, with no time and leisure to indulge the philosophic and scientific impulse to contemplate the universe at large. It is fortunate indeed that most people do not have this impulse, for they are the people who make the world go round. In hospital I do not want too dreamily philosophical a nurse or physician. One of the virtues of organized religion is that whether it is true or false it does to a certain extent cater for the speculative and even to some extent cosmic impulses in a wide section of the population, despite a certain anthropocentricity in some features of some of the world's religions.

Religious experience does of course often take specific forms depending on particular religions or cultural circumstances. Catholic peasants may report an encounter with the Virgin Mary, whereas Muslims, Jews or Buddhists would hardly do so. Again particular circumstances may have something to do with it, as in the case of Paul on the road to Damascus, feeling turmoil and guilt about his previous activities of persecuting Christians, seeing a great light and seeming to hear the voice of a risen Jesus. (Acts xii, 3–19; xxii, 6–21; xxvi, 12–18. In the first of these passages Paul's companions are said to hear the voice, but not in the second. Perhaps the light could have been an unusual light in the atmosphere. A sceptic would have to take the companions having heard the voice too as an embellishment of the story in later years, or of the companions' recollection soon afterwards.) Joan of Arc heard voices, and some have put this down to tuberculosis affecting her brain. The point is not

that these explanations are indeed the correct ones: it is that someone who has naturalistic preconceptions will always in fact find some naturalistic explanation more plausible than a supernatural one. The words 'in fact' in the previous sentence are important. I am talking about the world as I believe it is. Suppose that I woke up in the night and saw the stars arranged in shapes that spelt out the Apostles' Creed. I would know that astronomically it is impossible that stars should have so changed their positions. I don't know what I would think. Perhaps I would think that I was dreaming or that I had gone mad. What if everyone else seemed to me to be telling me that the same thing had happened? Then I might not only think that I had gone mad – I would probably *go* mad. Well established astronomical knowledge is not so easily abandoned. Of course I am here trespassing over the border between the discussion of religious experience and that of miracles. The topics clearly overlap and I shall return to the discussion of miracles in a later section.

Sometimes religious experience can consist of a sudden feeling of certitude, peace, joy, fear, the presence of God. A good example can be seen in Blaise Pascal's report of his own conversion experience.[82] Such a report can be very impressive, though there is no valid inference from the fact that the thoughts are had to the proposition that God in fact exists. To *feel* certain need not be to *be* certain. The converted person believes that the thoughts have a supernatural cause, but the naturalist will prefer some naturalistic explanation in terms of the psychological history of the person in question.

The word 'experience' can have a less 'inner' or 'subjective' connotation, as when a person is said to have had 'experience of life', 'military experience', even, as we read in job advertisements, 'experience in marketing'. In this sense a monk (for example) certainly has religious experience, but he need not have any specifically religious experiences. In this connection we should consider the question of whether a person's religiously motivated life, say as a Christian, is evidential value for others. The person's religious beliefs may be a source of many excellent traits of character and of motivation to beneficial and effective action. This may be so, but it does not bear on the truth of the beliefs. There are also good and admirable persons who profess mutually incompatible religions and (more importantly) no religion at all. Scepticism helped David Hume to be *le bon David*. More to the point, there have been self-sacrificing atheist saints. Waiving this point, I must insist that it is important to distinguish between the question of whether a belief is true and the question of whether it is useful to have it.

It could be that the religious experience of a person, in the sense of 'experience' appropriate to the above mentioned example of the monk or that of 'military experience', might be undertaken precisely *in order to induce religious belief*. This is the course advocated by Pascal, in his notion of a

wager. Pascal's Wager will be discussed in the next section. The argument of the wager purports to prove that one should by a sort of brain washing, going to masses, using holy water, and so on, induce belief in the Catholic religion. Pascal, as already a believer, would probably disapprove of the term 'brainwashing'. It is not clear whether he would regard the acquisition of belief after immersing oneself in Catholic practices as explicable naturalistically. He might have held that these practices somehow attract the grace of God. To the sceptic of course the whole thing must initially appear as a sort of brainwashing. Such psychological mechanisms are indeed possible. One might cultivate the company of conservatively religious persons, avoid reading books such as Bertrand Russell's *Why I am not a Christian*,[83] and confine one's philosophical reading to St Thomas Aquinas, or better still avoid philosophical reading altogether and stick to electronics or pure mathematics, or other theologically neutral subject matter, and to practical activities. Whether it would be rational to submit to such non-rational processes is another matter. To decide this we must wait on our discussion of the wager.

10 Pascal's Wager

Pascal, the important seventeenth-century mathematician and physicist, became an adherent of the austere Jansenist group of Catholics who were rivals of the more worldly Jesuits. Pascal held that the existence of God could not be proved by reason. (Later, the First Vatican Council was to condemn this opinion as a heresy.) He implicitly conflated belief in God with belief in the Catholic religion, including its doctrine about bliss in heaven and infinite torment in hell. So for him the only two 'living options', as William James called them,[84] were Catholicism on the one hand and atheism on the other hand. For example, he would not think of Islam and a Muslim would not think of Catholicism. Moreover, there are other options, though not ones that Pascal would have considered. Nevertheless in evaluating Pascal's argument we must consider other options.

Still, let us for the moment pretend that Pascal's two options are the only ones and follow his argument which can be put simply as follows. Pascal argued that Catholicism has a non-zero probability. He concedes that it is possible that one might have many pleasures in our earthly life which would be lost to us if we embraced a strict religious life. However, Pascal points out that such happiness could only be finite. Even the smallest finite probability of infinite torment in hell would outweigh it, since it would give an infinitely negative 'expected utility' (to use a present day terminology). The product of an infinite unhappiness with even the smallest non-zero

probability of its occurrence will still be infinite. So it is prudent to embrace the religious life.[85]

As I have suggested, one thing wrong with the argument is precisely in the supposition that there are only the two options. Pascal could compare only those options that were live for him, but options might be live for us though not for Pascal. Furthermore Pascal makes the assumption that the only alternative to atheism is Catholicism with its additional doctrines of heaven and hell. These assumptions could be questioned and we could shed doubt on the factual assumptions behind the argument.

One assumption of Pascal's argument is of the existence of an afterlife and of the possibility of eternal damnation if we reject the Christian religion, perhaps even just its Catholic version. But maybe it is some other religion that will be rewarded by God. Just as conceivable as Pascal's assumption, as Antony Flew has remarked, is that 'there is a hidden God who will consign all and only Catholics to the fate they so easily approve for others'.[86] (Still it might be judged much less probable than the orthodox belief – if so the argument could perhaps be sound.) Similarly, as William James remarked, there might be a Deity, who took 'particular pleasure in cutting off believers of this pattern [i.e. on the basis of Pascal's Wager] from their infinite reward'.[87]

Modern views about hell fire, even in the Catholic church, though not in some Protestant sects, and certainly in the Church of England whose theology becomes more and more indefinite in other ways as well, have softened considerably. If God is not only omnipotent and omniscient but also benevolent he would surely not consign people to hell fire. Of course the doctrine of hell fire is often regarded as mythical, implying only the pains of guilty feelings and alienation from God. We could raise the question of whether an omnipotent, omniscient and benevolent God would allow even these pains. Furthermore literal belief in an afterlife at all has weakened among many Christians. In evaluating the argument I have set aside these softening considerations. It seems that even on its own terms the argument of Pascal's Wager has the flaw of unconsidered assumptions, and with these assumptions added there is too much indeterminacy with opposing positive and negative infinities to be balanced up.

The argument of Pascal's Wager is an example of a pragmatic argument for belief. The argument is that belief is *useful*, not that it is *true*. Though Pascal's argument is flawed and in any case is stated in terms that do not appeal to the contemporary theological mind, similarly pragmatic arguments suggest themselves. If belief (in God or in some particular religious system in detail) makes us happier, why should we not try to inculcate it into ourselves, if necessary by non-rational means? A friend of mine, an exceptionally admirable philosopher of long-standing positivist bent, said to me that it was a

pity to deprive people of their religious beliefs, since these gave them solace, and he said that he himself regretted not being able to share these beliefs. Now consider the case of a hypothetical person Mary who believes that if she continues the study of philosophy she would lead an unhappy life, missing belief in God and perhaps belief in an afterlife. Should she abandon philosophy and confine her studies entirely to (say) electronics or pure mathematics? Mary might feel that there would be something shameful in taking such a course, but it is not easy to see how from a consequentialist and prudential point of view it would not be the right one.

Of course consequentialism is not (and in my opinion ought not to be) purely prudential. It needs to consider not only one's own happiness but that of all sentient creatures. Now Mary might consider that her religious beliefs, solacing though they are for herself, are indirectly harmful. She might point to various consequences of religious belief that she considers harmful. Religious wars might be one of them, overpopulation with the probability of mass starvation, disease and eventual world population collapse, might be another, with religious beliefs making population control hard to bring about. So Mary might think in a consequentialist way that arguing herself out of her religious belief might improve the general happiness even though not her own happiness. Alternatively she might think that knowing the truth is one of her intrinsic values. She might want the truth at all costs, even at that of her own happiness. Let us for the sake of argument suppose that Mary's beliefs about the bad social consequences of religion are false or that the evil effects are outweighed by the good social works undertaken in the name of religion. What about the prudential considerations?

Once again, we might consider that Mary could be wrong about the empirical facts. In my experience arguing oneself out of one's religious beliefs can bring about peace of mind, since one does not need all the time to square one's religious beliefs with continuing developments in cosmology, biology and for that matter philosophy. (Some deny that there is nowadays conflict between science and religion but I have challenged this view on pp. 9–13.) The philosopher and logician Arthur Prior once confirmed to me in conversation that this sort of peace of mind can indeed come from rejection of one's previous theological beliefs.

In his essay 'The Will to Believe' William James expressed a good deal of distaste for Pascal's argument, holding that Pascal's talk of believing by our volition seems 'from one point of view, simply silly' and 'from another point of view it is vile'.[88] Silly because for a Protestant the remedy of masses and holy water would not be a live option, and vile because of its difference from the scientific attitude of testing hypotheses by evidence. Nevertheless, James did think that if we are concerned with a forced option of how to live our lives then the option of faith and a leap in the dark is an appropriate one to

take. So despite his reservation about Pascal his own attitude was not really so different. Indeed James held that if we take the leap of faith belief will follow. (Or indeed not so much follow as be there already, given James's largely behaviourist theory of belief.) It may be that James's pragmatism was a source of his view in 'The Will to Believe' since the notion of working in practice in the sense of leading to a worthwhile life could easily have been confused in his mind with verification of a hypothesis by observation. Explicitly, I think, he did distinguish the two things but even within this one essay he was not always a very self-consistent writer, and this makes him hard to interpret. His views are probably not as outrageous as a superficial account of them might suggest. Be that as it may, his 'Will to Believe' does suggest something like the decision to brainwash oneself.

Religious apologists do sometimes defend a leap of faith by saying that science itself depends on a giant leap of faith. They might point out that since Hume raised the philosophical problem of induction it has appeared that we have no reason to believe that the future will be like the past. According to Hume laws of nature are mere regularities whose continuance in the future cannot be justified by reason. Nowadays we might put it by saying that hypotheses are always underdetermined by observation. The apologists could seek a similarity between attempted pragmatic justifications of induction (or scientific method) and the religious pragmatism of William James. These attempt to show that if any method of predicting the future works then induction (the scientific method) works. (Of course science is concerned not only with prediction but with explanation and with theoretical knowledge, and there is a question of whether the pragmatic vindication of induction could be taken beyond vindicating it as a mere prediction device.) There does nevertheless seem to be an important difference. Many people have no difficulty in living without religious belief but no philosophical sceptic about induction could continue to live if he or she really believed this scepticism. The spectacular advances of science, and its applications to technology and to medicine, would seem to me to make impossible a really sincere philosophical scepticism about scientific method. Even fundamentalist Protestant sects in the USA who promulgate a two-thousand-year-old view of the universe do so unblushingly with the aid of modern electronics of radio and television and their medical missionaries make use of the most sophisticated biological techniques of contemporary medicine. The religious leap of faith is therefore a leap additional to that of the scientist, not an *alternative* to it. I conjecture that the sort of religious apologist that I am considering here would have to be an instrumentalist in the philosophy of science, and a realist in theology. It is an uncomfortable position. By contrast an atheist who was a scientific realist need not be an instrumentalist about theological statements: he or she might simply give them the truth value 'false'.

11 Miracles

The discussion in section 9 on the argument from religious experience led on naturally to a brief discussion of Pascal's Wager and James's 'Will to Believe'. It should also lead on to a discussion of miracles, in so far as if one did witness a miracle, this would surely count as having a religious experience. Still if there really are miracles, perception of them would usually be by the usual organs of perception, eyes, ears and so on. So 'experience' here would not refer to a special mode of acquiring knowledge, though the knowledge acquired (if it *was* acquired) would be of something naturalistically inexplicable. Discussion of the reality of miracles, and of if or how we could be assured that a miracle really occurred, usually concerns itself with the reliability of witnesses and this will lead on in section 12 to some remarks on the New Testament.

One type of alleged miracle is that of 'conversion experience', as in the case of St Paul already mentioned. These, as William James remarked, certainly occur.[89] On the other hand a sceptic will put the experience down to natural causes, and so while agreeing that the experience existed will deny that any supernatural cause of it existed or that putative perceptions involved were veridical. Conversion experiences are inevitably subjective, and our attitude to reports of them will depend on our views about the argument from religious experience. The sceptic may agree that the experience is in fact had but will doubt that it constitutes a perception of anything external. On the other hand there are claimed to be inter-subjectively observable miracles, for example the feeding of the five thousand or the appearance of angels at the battle of Mons, to take two very different examples.

Such a miracle as the feeding of the five thousand clearly involves a violation of the laws of nature. Some philosophers have contended that this makes the notion of a miracle a self-contradictory one, on the grounds that an exception to a putative law of nature would show that the putative law was not really a law and that laws are universal regularities. This objection can be got over by supposing a clause in the statement of any law of nature 'except when there is divine intervention'. Or to put it otherwise, the laws of nature tell us how the universe regularly works, even though there can be miraculous exceptions. A theist might say that the laws of nature are imposed by God on the universe as a whole by one comprehensive creative act, whereas miracles would be exceptional events imposed by God for particular reasons at particular locations in space–time. Such a notion is not obviously contradictory though I sense a problem of whether a truly omnipotent and omniscient God would not be able to create a universe in which the laws of nature would be such that the desired exceptional events occurred without breaking a suitably chosen set of laws, and whether God, for aesthetic reasons if for no other,

would not want to do the job this way. Perhaps a theist could indeed say that this is how the universe really is: that miracles are only events that *appear* to be contrary to the laws of nature.

Anyway, whether subsumable under law or not, miracles must be remarkable events serving some divine purpose. Sometimes it has been held that one purpose of miracles is to induce faith in those who saw or heard of them. We wonder then why God does not perform miracles for all to see, not just for a favoured few. To refer to a previous example, perhaps the stars could be so placed as to spell out the Apostles' Creed in Greek. Alpha Centaurians would see the stars in different patterns from those that we see, but perhaps somewhere in the sky they would see a pattern of verses in Alpha Centaurian.

Because miracles are, or appear to be, exceptions to the laws of nature there is a *prima facie* reason for doubting any report of a miracle. There is always the possibility of explaining away such reports by reference, as Hume remarked, to the well-known phenomena of the credulity and knavery of humankind. Nevertheless someone who *already* believed in an omnipotent being would have some possibility of rational belief in a miracle story. At least such a story would cohere better with his or her system of belief than would be the case with the system of belief of a sceptic or atheist.

At one place in his very well-known essay on miracles, section 10 of his *Enquiry Concerning Human Understanding*, David Hume put forward his scepticism about miracles with a qualification: he said that 'a miracle can never be proved *so as to be the foundation of a system of religion*' (my italics). The interpretation of this very readable and at first sight very lucid essay has given rise to surprisingly many scholarly problems, as can be seen, for example, from Antony Flew's learned chapter in his *Hume's Philosophy of Belief*.[90]

As I read Hume he is concerned to establish the weaker point, that a miracle cannot be proved 'so as to be the foundation of a system of religion'. He does not quite claim to prove that a miracle could not be proved, but he does hold that a miracle cannot be proved so as to be the foundation of a system of religion. Nevertheless he argues that in fact, with the background knowledge that educated theists, atheists and sceptics should be expected to have in modern times, such a proof of a miracle encounters great obstacles, even though by 'proof' here is meant something less than apodeictic proof but only the sort of establishment that scientific hypotheses are capable of. He does think that 'there may be miracles or violations of the usual course of nature, of such a kind as to admit of proof from human testimony' but he adds that 'perhaps it will be impossible to find any such in all the records of human history'.

Sometimes when we find a miraculous fact extremely well attested we do not need to say 'Ah! a miracle', but look for a naturalistic explanation. This happens with reports of miraculous cures of disease. It is possible to suppose

that the original diagnosis was incorrect. Again, many diseases have spontaneous remissions which are not regarded by medical experts as miraculous. Furthermore our understanding of psychosomatic medicine may allow us to explain some apparently miraculous cures of illness. Sometimes we doubt the fact itself. The man raised from the dead may not really have been dead. On the other hand, to allude to an example discussed by Hume, if a one-legged man is reported to have been made two-legged, we judge that there must have been some error in the testimony. There can hardly be misdiagnosis of the number of a man's legs, and there could be no medical or biological explanation of the sudden sprouting of a previously amputated human leg. Hume puts the point in too empiricist a way. He holds our doubt of the report of such a sprouting of a leg to be 'because it is contrary to our experience'. The credulity and knavery of humankind (and perhaps love of the marvellous for its own sake) provide a ready enough explanation. However, by just saying 'contrary to experience' Hume does not do justice to the importance of *theory* in our scientific background knowledge. Consider the explosion of an asteroid eight kilometres above a fortunately uninhabited part of Siberia early in this century, flattening trees over 2,200 square kilometres. Fortunately the observation of such an occurrence is not a common experience, but our knowledge of the astronomy of the solar system is such that an occurrence of this sort is quite intelligible and to be expected to occur occasionally.

We must remember that in his discussion of miracles Hume was not in his mood of extreme epistemological scepticism, according to which anything could be followed by anything. That is, Hume is not concerned with mere *logical* inconsistency. Hume was of course aware that there is no logical inconsistency in supposing that a one-legged man suddenly sprouted a new second leg. We must suppose that Hume is concerned with physical possibility or impossibility. Now our notion of physical possibility has to do with the question of whether a phenomenon fits coherently into a web of belief. Of course there are anomalies in science, but these are not regarded as miracles. A good example from the past is that of the advance of the perihelion of Mercury, which could not be fitted in with Newtonian mechanics and gravitational theory, but which later was accommodated by the general theory of relativity. Normally a scientist will not abandon a theory until there is a better theory to replace it. (Compare Bruce Bairnsfather's First World War cartoon, of 'Old Bill' with another soldier sitting in a shell hole with all sorts of stuff bursting around, and saying 'Well, if you knows of a better 'ole, go to it'.) Alternatively the scientist may be sceptical of reports of a refractory phenomenon. People who are *too* empiricist, accepting observation reports too readily, join forces in the credulity stakes with those who are not empiricist enough, and are ready to believe any theory however inadequately it has been tested.

Need the concept of a miracle involve that of a violation of the laws of nature? Not always, because the notion of a miracle, as with other non-trivial concepts, has what Friedrich Waismann has called 'open texture'.[91] I think that it would be perfectly proper to give the name 'miracle' to a religiously significant and unusual event, such as the parting of the Red Sea which allowed the Israelites fleeing from Egypt to pass through, even though the event could be given a naturalistic explanation. The term 'miracle' would be even more appropriate if it were claimed that God had set up the universe to contain the event, even though it occurred in accordance with deterministic laws.[92] Similarly God might have set up the universe so that the event occurred indeterministically but without violating quantum mechanical laws.

Even so, if the event was naturalistically possible but very improbable we might be justified in doubting the truth of the report of it. Its very significance in a religious context might increase the probability that this highly improbable event never occurred, and that the report of it was fictional, part of a story told (and even believed by its narrator) in a more credulous age. It is indeed often foolish to believe one's own eyes, as is shown by the existence of clever conjurors. In fact the existence of conjurors illustrates the fact that things can often occur in a natural way, even though we have no idea how they occurred.

Here we are obviously passing from the topic of the conception of the miraculous to that of the assessment of testimony, and thus to questions in the philosophy of history, and in particular to that of the higher criticism of the New Testament. Historical evidence of course goes beyond documents and verbal reports: we must also consider relevant archaeological information and other evidence, such as from astronomy.[93]

12 Higher Criticism of the New Testament

This section is particularly concerned with the Christian form of theism. Adherents of Judaism and Islam would claim that they have the purest form of monotheism because of Christianity's difficult notion of the Trinity. Like Christians, however, they are people of a Sacred Book and questions in the philosophy of history and of testimony in general, which have arisen in the higher criticism of the New Testament, may have some applications in the study of these other religions. I shall not investigate this further matter here.

Certainly many Christians believe in God and the divinity of Jesus because they believe in the literal truth of the Old and New Testaments. It also works the other way (often in the same people): people believe in the historical truth of much at least of the New Testament because they believe in God and his

veracity. Thus in some cases the argument can become circular. Of course many people believe without argument.

The higher criticism of the New Testament is essentially a matter of looking at the documents and other evidence (for example, archaeological evidence) as a good historian would do in any other field of history. It is true that there are good, even outstandingly excellent, historians who do not carry over their normal methodologies to the evaluation of the New Testament. This need not be an all or nothing affair. A historian may make place for the supernatural when he or she evaluates the New Testament even though he or she would not do this when writing on, say, the Wars of the Roses or the first Reform Bill. Nor need there be any brash abandonment of reverential language. Thus Dennis Nineham in a fine commentary on St Mark's Gospel[94] regularly refers to Jesus as 'our Lord', and yet his arguments are in many ways quite sceptical. There is a variety of positions between supernaturalist and totally naturalist opinions about the historical Jesus and where a commentator comes down here must depend to a great degree on his or her implicit or explicit notions of the metaphysical possibilities.

This was the theme of F.H. Bradley's first publication, *The Presuppositions of Critical History* (1874).[95] Bradley was stimulated to write this work on the philosophy of history as a result of the new critical work on the New Testament and the beginnings of Christianity by F.C. Baur, D.F. Strauss and C. Holsten. His arguments are sometimes a bit like those of Hume on miracles, but while Hume as an empiricist spoke of the unusual or what is contrary to experience, Bradley was rightly more coherentist about warranted assertability, stressing the way our experience is laden with theory and other background beliefs, whether scientific or metaphysical. He refers to Paley's protest against 'prejudication' and states on the contrary that all history must rest in part on prejudications.[96] His idea is that our historical conclusions come from inference, which is 'never a fragmentary isolated act of our mind, but is essentially connected with, and in entire dependence, on the character of our general consciousness'.[97] Stripped of his idealist language I think that Bradley's talk here is much the same as Quine's talk of 'a web of belief', which I have adopted earlier in this essay. It should be noted that in his essay Bradley is concerning himself purely with testimony and documents. Historians also make use of archaeological evidence, but in the present context I shall neglect this complication.

Bradley recognizes that historical testimony that may not be accepted at one time because it did not fit into a web of belief may become accepted later because the web has been expanded and modified. He mentions Herodotus's disbelief in the Phoenicians' story of their circumnavigation of Africa because they said that they had seen the sun to their north. Modern geographical and astronomical knowledge fits this fact about the sun beautifully into our web of

belief so as to make us feel completely sure of the truth of the Phoenicians' claim to have sailed round the south of Africa. Bradley also refers to the alleged phenomena of stigmata which might more recently have come to be regarded as medically possible, and to the report of African confessors who spoke even though their tongues had been cut out, which had, he says, come to be regarded as physiologically possible.[98]

C.A.J. Coady, in his valuable book *Testimony: A Philosophical Study*,[99] worries that Hume's and Bradley's criteria would have ruled out acceptance of many historical propositions that we now regard as quite certain, such as reports of human sacrifice or of trial by ordeal, Socrates' acceptance of death rather than freedom, and the astonishing feats of Napoleon Bonaparte. In connection with the last case he quotes from Archbishop Whateley's witty *Historic Doubts Relative to Napoleon Bonaparte*.[100] In reply I would urge that though Napoleon was unusual and so were many of his deeds and sufferings, we are aware of the great variability of human character, talents and abilities, and so in a sense the humanly unusual is usual. At any rate it fits well into what we know of human genetics, plasticity of brain function and so on. The case is different with the resurrection of Jesus. Similarly with Coady's examples of human sacrifice and trial by ordeal. These may be unusual in our experience, but are perfectly compatible with what we know of human nature. This example shows the importance of the notion of coherence in this connection, rather than those of 'the usual' or 'the analogous'. (Bradley did use the latter term, but he need not have.)

Of course in science we do have anomalies. Consider the advance of the perihelion of Mercury which was unexplained until Newtonian gravitational theory was succeeded by general relativity. In such cases, however, we are dealing with repeated or repeatable observations or experiments. Moreover scientists do not despair of a naturalistic explanation of anomalies: they wait until a better theory explains them. (Except in cases in which doubt is cast on the observations or experiments, but in these cases we do not have a proper anomaly.) Indeed this came about in the historical case of the Phoenicians and the circumnavigation of Africa. We might give a naturalistic explanation of Jesus appearing to his disciples after his death but then it would lose its main religious significance. There have indeed been theories that Jesus did not die on the cross but appeared to be dead and was entombed in a state that mimicked that of death, later recovering and being seen on the road to Emmaus. I do not want to put any weight on such speculations.

If a person already has positive beliefs about the supernatural many of the supernatural elements in the Gospels may well be easily assimilated into his or her web of belief. However, if one is already sceptical about the facts of the historical Jesus then one will have a very different attitude to the Biblical documents. Some scholars might indeed assess the documentary evidence in

a more straightforward fashion, though not necessarily uncritically, as the work of many outstanding Christian New Testament scholars will testify. Orthodox commentators will be interested in explaining the existence of inconsistencies and other oddities in the documents, doing linguistic analyses of style and vocabulary to shed light on authors and sources. Nevertheless they will disagree, with those of more naturalistic bent, who will go much further in getting behind the Gospel stories at what they conceive of as the historical Jesus. Of course one might eliminate all the supernatural from the Gospel stories and still remain a theist. Nevertheless I think that the higher criticism of the New Testament is after all relevant to theism, since belief is holistic and changes in one area can influence strength of belief in other areas. For other theistic religions of course it is not necessary to believe in the divinity and resurrection of Jesus, though analogous problems may exist elsewhere.

Revelation may be more plausible to one who already finds belief in the supernatural plausible, but it should be obvious that revelation by itself cannot without circularity be used to justify its own validity.

There are many reasons for distrusting much in the Gospel stories. The earliest Gospel to be written was that of St Mark and is dated by scholars many years after the crucifixion. Matthew and Luke incorporated the gist of almost all of Mark into their Gospels, in which scholars have detected another hypothetical documentary source, called 'Q'. Mark also would have depended on oral tradition. It is commonplace that oral tradition can lead to distortions and exaggerations as words are passed from one mouth to another. There were stories of virgin birth and resurrection elsewhere in the Middle East, neo-Platonic influences from Greek philosophy, and historians in ancient times were not as scrupulous about literal truth as are modern ones. There is the puzzle of the different authorship (discovered by philological investigation) of the final verses of Mark. Changes, both intentional and unintentional, can also creep in as manuscripts are transcribed. These considerations already give some latitude to a sceptical commentator, but there are other important matters of methodology. For example, if a passage seems to be inconsistent with the author's evangelical purpose it is likely that it is true: the evangelist could not omit or change it because it was so well known. What I want to concentrate on here, however, is the sort of consideration emphasized by Bradley, namely that of metaphysical presuppositions. Suppose that, as I do, you regard the best touchstone of metaphysical truth to be plausibility in the light of total science, how will the gospel stories look to you? This attitude seems to me to be reasonable, since science tries to attain *well tested* theories. There are of course areas of controversy. Nevertheless, it is the case that there is a huge body of well tested and uncontroversial established fact and theory.

The historical Jesus has proved to be elusive. All sorts of accounts have been made, ranging from the literalist and supernaturalist to the sceptical and naturalistic. A naturalistic account that has appealed to me as plausible is that of S.G.F. Brandon.[101] However, I am not a historian or a New Testament scholar, and so I suggest that the cautious reader should take what I say about Brandon's theory as merely illustrative of the possibility of a plausible naturalistic theory and also illustrative of Bradley's view about the importance of presuppositions (mine being naturalistic) in critical history.

Brandon's hypothesis is that Jesus was closely connected with the zealots, Jewish resistance fighters against the Roman occupation. This explains his trial at the hands of Pilate, which must have been for sedition, not for blasphemy. Blasphemy was a matter for the Jewish religious establishment and the penalty for this was not crucifixion but stoning. That Jesus' trial was for sedition explains Pilate's involvement: if it had been for blasphemy it would have been in a Jewish court. Mark had a motive for wanting to transfer responsibility from the Romans to the Jews. Mark was writing largely for the Roman Christians, whose position was uncomfortable as it was at the time of the great Jewish revolt and the consequent destruction of Jerusalem, and he would have been at pains to conceal the connection of the original Christians with zealotry and hence sedition, for fear of bringing harm to the Christians in Rome. At least one of the disciples actually was a zealot, Simon the zealot. Luke, writing later after the fuss over the Jewish revolt had died down, explicitly called Simon by the Greek word 'zelotes', whereas Mark more cagily used the Aramaic word, 'Cananaean', which would not be easily understood by the Roman Christians. The two 'thieves' who were crucified with Jesus were probably zealots, since the Romans referred to zealots as 'lestai' (brigands).

The above is merely meant as a very small *sample* of considerations brought forward by Brandon in a book full of technical philological and historical scholarship. The interested reader is referred to Brandon's work itself. 'A pretty tall story', an orthodox believer might say, 'Jesus a leader of revolutionaries, something like modern mujahideen? Poppycock! Jesus said "Turn the other cheek".' Yes, one might reply, but he also said that he did not come to bring peace but a sword. The disciples in Gethsemane were armed. And so the dialogue might go on. What should we believe, the orthodox story or the naturalistic one or something in between? (Or of course some other possible naturalistic story?)

Brandon's theory might be shown to be implausible, but could it be *less* plausible than the orthodox story that Jesus performed miracles and not only claimed to be the son of God (and even this has been doubted) but *was* the son of God, and after the crucifixion rose bodily into heaven? A balancing of plausibilities is needed and the metaphysical presuppositions of the reader will largely determine which way the balance falls.

There is a common argument for the literal truth of the Biblical account of the Resurrection of Jesus. The naturalistic metaphysician will of course wonder about the very biological possibility of resurrection or immortality as commonly conceived. So the argument had better be a very good one. The argument relies on the sudden transformation of the disciples after the crucifixion from a fearful group of people huddling in an upper room to a brave and successful lot of evangelists and martyrs. How could this have happened, it is asked, if they had not really seen the risen Jesus? The transformation was indeed wonderful, but the workings of the human brain are extremely complex and can be expected to issue in surprises. In any case the transformation may not have been all that surprising. Experience of millennarian sects has given us instances of how resistant their devotees can be to empirical disconfirmation when their millennarian expectations do not eventuate. *Ad hoc* excuses are made: they had got the date wrong, and so on. A sect may be smugly sure of being the chosen few who will be saved while all others are engulfed in a general deluge, and so will not proselytize. However, when the prophecy fails there will be an inner doubt, despite the *ad hoc* excuses. Proselytizing will suddenly become congenial because it widens the circle of people who give reassuring agreement with the sect's tenets. A sect which behaved in this sort of way has indeed been studied and their behaviour given a sophisticated psychological explanation roughly on these lines, by the American psychologists Leon Festinger, Henry W. Riecken and Stanley Schachter.[102] Another partial explanation of the spread of Christianity was the activities of St Paul, who grafted on ideas characteristic of Greek and near eastern philosophy, and who has been described by some scholars as the inventor of Christianity.

13 The Problem of Evil

After this brief excursion into the philosophy of history as it applies to New Testament theology, let us return from Christianity to theism in general. The concept of God as it is understood in the main monotheistic religions is that of an omnipotent, omniscient and altogether *good* being. Then the problem arises: how can there be evil in the world? For the atheist there is no problem: there is the amount of goodness and evil that we observe, and both are explicable. We think that altruism is good and (as was suggested on p. 31) there are sociobiological and evolutionary explanations of at least a limited altruism, and intellectual pressures, such as analogy with scientific law, that can push towards a universalistic altruism. Nor is evil a problem for the atheist. As was suggested in an earlier section a biologist can talk in 'as if' purposive terms. There is natural selection for various traits of character, or

rather tendencies to these traits, since character depends also on education and environment. For example, human combativeness is a very bad and dangerous trait in our H-bomb age, but it presumably had survival value in prehistoric times. (Perhaps the combative man is more likely to be killed, but if he helps to preserve his near relatives some of his genes will be passed on. In any case attack may be the best method of defence.) The more aggressive tribes may kill off the less aggressive ones. So what is a bad trait in an H-bomb era has evolved. (Just as the bad placement of the sump hole of our sinuses evolved when our ancestors had four legs and held their heads downwards.) Moreover, bad traits can arise in special cases without selection. If we think of human biology in an 'as if' or pseudo-teleological way we can think of ourselves as machines that simply go wrong, as all machines tend to do. There are more ways of going wrong than there are of going right.

So we should not be at all surprised at the existence of human criminality and general badness. Nor need we be surprised, as naturalistically minded people, at natural evils. There are earthquakes, volcanoes, hurricanes and bacteria and viruses that harm us. Would it not surprise us if the world were *not* such as to contain things that harm us 'poor forked creatures'? There is no problem for the atheist in the existence of good things and bad things alike.

On the other hand for the theist evil is a big problem. If God is omniscient he knows how to prevent evil, if he is omnipotent he can prevent evil, and if he is benevolent he wants to prevent evil. The theist believes that God is omnipotent, omniscient and benevolent. If the theist's beliefs are correct, how then can there be evil? Unless the theist is prepared to settle for a finite 'big brother' God, his or her problem seems insoluble. However, as I observed earlier, a finite 'big brother' God would be just one big thing in the universe, not the infinite God of the great monotheistic religions, the God who created the universe.

There have indeed been countless attempts to solve this apparently insoluble problem for theism. The literature of these attempts is called 'theodicy', derived from the Greek words for 'God' and 'just'. Whole books have been written on this subject, and it is impossible in a short space to deal with all the attempts that have been made. It looks as though the theistic hypothesis is an empirically refutable one, so that theism becomes a refuted scientific theory. The argument goes: (1) If God exists then there is no evil, (2) There is evil, therefore (3) It is not the case that God exists. Premiss (1) seems to follow from our characterization of God as an omnipotent, omniscient and benevolent being. (2) is empirical. We can hardly reject (2). It seems therefore that the theist has to find something wrong with (1) and this is not easy. I shall discuss only some standard ways in which philosophers and theologians have tried to reconcile the existence of God with that of evil. The

discussion will suggest that there is a real problem for the theist here, and that probably no *plausible* solution of the problem exists.

Since God creates not only the universe but the laws according to which it operates, he is not bound by any merely physical necessity. The only necessity that binds him is logical necessity; for example, he cannot create a universe in which pain both exists and does not exist. This is no real inability: since logical principles assert nothing about the world, so that whatever the world was like they would still apply, they do not constitute a constraint on God's power.

Nor do we need here to consider trick cases, such as whether God can make a box that he cannot open. These do not describe a real constraint on God's power. However, something a bit like this sort of problem will arise shortly when we consider 'the free will defence'.

Since God is not constrained by physical necessity there is no need for him to use painful means to attain a good end, as a dentist may have to when drilling a tooth.

The Free Will Defence

A common argument that is meant to reconcile God's omnipotence, omniscience and goodness with the existence of evil is that evil is due to misuse of the free will with which God has endowed us, and that the value of free will itself is so great as to outweigh the evils that proceed from it. The idea is usually combined with a libertarian theory of free will according to which free will is incompatible with determinism, and that even God could not create free beings who were always caused by their beliefs and desires to act rightly.

One weakness of the free will defence is its reliance on a libertarian theory of free will. I shall consider this shortly. Another weakness is, *prima facie* at least, that it totally ignores *natural* evils. Consider a two-year-old child dying painfully of cancer. To whose misuse of free will could this be put down? Even if free will had value, and if it was the misuse of free will by explorers that led to epidemics (as measles was brought to Australia and the South Pacific whose people lacked immune resistance to it), was the value of the free will comparable to the disvalue of the subsequent suffering? What about earthquakes, volcanoes, hurricanes which cause suffering due to no one's fault? What about the very existence of dangerous bacteria and viruses? It would betoken a mediaeval mind to put natural evils down to a wrong choice made in the Garden of Eden by Eve, and what a strange sort of God would have allowed such a choice to be so harmful. The story of Adam and Eve is of course capable of some allegorical truth. The apple brought the knowledge of good and evil, and certainly human increase in knowledge in general has brought many sufferings, as the invention of nuclear weapons will testify, as

well as of course many benefits. There is something in the notion of original sin, but I think that this should be thought of in terms of the defectiveness of our genetic endowment. Thus, as I already mentioned, pugnacity may have been much more appropriate in a prehistoric tribal environment and the genes for it may have been selected, but it is very inappropriate to a contemporary situation in which opposing nations have deadly weapons. Also many harmful genes or combinations of genes have been due to mutations or to recombinations and have not yet been weeded out by natural selection.

Natural evils thus provide a formidable difficulty for the free will defence. They have nothing to do with free will. It is true that some philosophers and theologians have put down the existence of natural evils to the free and malevolent choices of fallen angels. Such an explanation smacks of being *ad hoc* and it is thoroughly implausible. There are perfectly naturalistic explanations of the mutations of influenza viruses, volcanic eruptions, tidal waves and other disastrous things or events.

I now want to go on to say that even if we ignore natural evils the free will defence does not work. This is because an omnipotent, omniscient and benevolent being would make a universe in which everyone chose in a morally perfect manner. It might be that with the best will in the world a person might act wrongly because of imperfect knowledge of cause and effect (consequences of action) but at least God could have created beings without positive wickedness. Or perhaps God could have created a world of both bodily and spiritually incorruptible angels who would exercise their free will in purely intellectual or aesthetic choices which were such that bad consequences were impossible. This seems possible even on a libertarian or indeterministic theory of free will.

Even in a world such as ours where bad consequences may occur through lack of knowledge, free but wicked choices might be impossible. God could have created beings with purely moral desires, from which they would always act. Even on a libertarian theory of free will it is logically possible that everyone would always *in fact* act rightly. God, who surveys all time and space, could have created such a world.

If this is thought to be a contentious assertion, I can go on to say that this idea of a universe with all indeterministic choices being right is not necessary for my argument. This is because I will not grant the theist the notion of libertarian free will, which seems to me to be an absurd one. Let me explain. I hold that any sensible notion of free will is compatible with determinism. Indeed one could go further and say with R.E. Hobart, in a famous essay,[103] that not only is determinism *compatible* with free will but that at least a fair approximation to determinism is necessary for there to *be* free will. Of course, as Hobart recognized, modern physics is indeterministic, but approximates to determinism on the macro-level. Our nervous system is susceptible of

quantum effects, which are indeterministic, as for example our retina and visual system is sensitive to the arrival of a single photon, but it does not seem plausible that this indeterminism is important in affecting behaviour: it is doubtful whether our behaviour would be significantly different if our neurons were *completely* deterministic in their operation. In cricket a batsman facing a fast bowler has to have a very fast and reliable lot of computations going on in his brain or he would not be able to get his head out of the way of a fast moving ball. It is true that the person in the street tends to equate free will with indeterminism, if he or she is asked to make a philosophical comment about it. The question, however, is whether the concept of free will that is implied in everyday talk is or is not compatibilist. There is no clear answer here because there is not a precise boundary between everyday talk and metaphysical talk. Compatibilism seems right in relation to any sensible account of free will. Indeterminism does not confer freedom on us: I would feel that my freedom was impaired if I thought that a quantum mechanical trigger in my brain might cause me to leap into the garden and eat a slug.

It really is extraordinary how many physicists in their popular writings come out with the idea that quantum mechanical indeterminacy leaves room for free will. Roughly speaking – I shall make a qualification or two shortly – we feel free in so far as we are determined by our desires (together of course with our beliefs).

Some help here may come from J.L. Austin's suggestion that 'free' is really a negative word, used to rule out one or another way of being positively unfree.[104] We set a prisoner free and she goes wherever she wants. Before that she was unfree in that she wanted to go elsewhere, but could not do so. In a shotgun marriage we say that the bridegroom did not want to marry the bride but wanted even less to be shot by the prospective father-in-law. In another context the bridegroom could be said to be free, because he is doing what he wanted, that is to avoid being shot. In one way an alcoholic is free to stop drinking: he is not bound hand and foot and having the drink poured down his throat. On the other hand he may say that he is not free (or not able) to stop drinking. He wants to overcome his craving for drink but cannot do so. Here is a case in which he is thwarted in respect of a higher order desire (to modify his desire to drink) by the sheer inalterability of his lower order desire. We can modify the relative strengths of another person's desires in various ways: reasoning, rhetoric, persuasion, threats, promises. None of these are incompatible with determinism: indeed they all presuppose it, or at least (remembering quantum mechanics) an approximation to it. This is the notion of free will and responsibility of most use to the law. The main reason for punishment is deterrence. Deterrence is the imposing of conditions that change the relative strengths of a person's desires, such as not to be fined or

sent to prison. If our actions were not determined by our desires attempts at deterrence would be futile.

It is sometimes said that we can act from a sense of duty against our strongest desire or combination of desires.[105] Such an objector forgets that sense of duty is itself a desire (to do one's duty). This is a desire that parents, teachers, friends, clergy and commanding officers are keen to inculcate. (Immanuel Kant distinguished 'willing' from 'desiring' but this was to make a metaphysical mystery of something that can be naturalistically explained.)

Another thing that has commonly been said is that libertarian free will is acting from reasons, not from causes. This does not help. In one sense a reason *is* a cause. 'What was your reason for asking for coffee?' 'I just wanted coffee rather than tea.' Here the desire for coffee was greater than that for tea and the desire caused the action. On another occasion asking for a reason may be asking for a justification. 'Why did you do that?' 'I promised my wife that I'd do it.' Here there is implicit reference to a rule of promise keeping. The rule (or 'reason' in this sense) is not something that acts on us. The upshot is that acting from reasons is not something different from and possibly in conflict with acting from causes. The justificatory story is perfectly compatible with the causal story.

Because free will is compatible with determinism God could have set up the universe so that we always acted rightly, and so for this reason alone the free will defence does not work. I do have some sympathy with the view that the compatibilist account of free will does not quite capture the ordinary person's concept of free will. This, however, is because the ordinary person's concept of free will, if one gets him or her arguing in a pub, say, is inconsistent. The ordinary person wants the action to be determined, not merely random, but undetermined too. The compatibilist can say that if this is the concept of free will we clearly do not have free will, just as I don't have a round square table in my study. Once more the free will defence fails.

I hold, therefore, that the free will defence does not hold even for moral evils, evils due to the misuse of free will. In any case natural evils provide the biggest difficulty for the theist. Unconvincing replies are sometimes brought up. If people starve in a drought they are blamed for lack of foresight. This is a cruel reply and anyway presupposes a retributionist God. Moreover what wrong choice has been made by a child dying of cancer? As to the reply that natural evils are due to immoral choices by fallen angels, the reply seems to be quite fanciful. Furthermore, if my remarks about free will are correct God could have arranged it that angels acted freely and never fell. Waiving all these points also, one wonders how an omnipotent God would allow the fallen angels to get away with it. A benevolent government with sufficient power would arrest, imprison, or even execute a very devilish criminal who otherwise would kill millions.

Two other weak responses are the following. (1) God has a reason for allowing evil but we do not know what it is. Well, we know that God does not have a reason for allowing round squares because the notion of a round square is an inconsistent one. So if this answer is to work it must depend on one of the other defences. (2) It may be said that evil can enhance goodness, just as ugly chords can enhance a piece of music. I doubt whether the mother of the child dying of cancer would be impressed by this idea. A closely related idea, on which I touched when discussing Pascal's Wager, is that if the universe contains an infinite amount of goodness then a finite amount of badness leaves us with still an equal infinity of goodness.

Let a be the total amount of badness in the world, and let there be an infinite series of good things, $b + b + b + \ldots$. Then it may be held that $-a + b + b + b + \ldots = b + b + b + \ldots$. In Cantor's set theory the union of a finite set with an infinite set has the same transfinite number as the infinite set. The set that contains all the stars in our galaxy together with all the integers is no bigger than the set of all the integers itself. So if (rather absurdly) we were to assign a value v to each star and also to each integer, the value of the set containing both the stars and the integers would be no greater than that of the set containing only the integers. (There would be other curiosities, such as that the value of all the even integers would be equal to the value of all the even and odd integers.) I conclude that analogies inspired by Cantorian set theory are unhelpful, even if not positively absurd. We should say that the value of the universe containing positive evils is less than that of the infinitely good universe containing no positive evils. So God would perhaps have allowed the $b + b + b + \ldots$ universe but would not have allowed the $-a + b + b + b + \ldots$ universe. He would not have allowed the universe with the child dying of cancer.

This consideration that even an infinitely good universe should contain no positive evils within it enables me to deal with another, and more interesting, defence of theism.[106] This is that it is unfair to ask of even an omnipotent God that he should create the best possible universe, since of any universe we can conceive of a better. This might lead us to some interesting speculations related to the theory of transfinite cardinal numbers, but let us for the sake of argument concede the point. If it is logically impossible that any universe is the best possible, then indeed even omnipotence could not create such a universe. Nevertheless, surely we would expect an omnipotent and benevolent God to have created a universe without positive evils.

Contemplating evil, I feel the attractions of a philosophy, such as that of the Ādvaita Vedānta, according to which reality is very different from what it seems or what we could possibly know, and that the world as we think we know it, including both good things and bad things, is illusory. However, such a philosophy cannot be stated without absurdity. Though

I feel its attraction it is compatible neither with orthodox theism nor with the sort of scientific realism that I am compelled to defend.

14 Historical Theism and Metaphysical Theism

By 'Historical Theism' I mean theism as integrated into the great monotheistic religions. By 'Metaphysical Theism' I mean theism which is independent of all considerations of time and place, such as a chosen people in Palestine or of the birth and crucifixion of Jesus. Islam is rather different, and is very austere in its concept of God, as is shown by its prohibition of pictorial representations. Nevertheless it does have its sacred places and the revelation of the Koran to a particular prophet, Mohammed. The difficulty for many modern would-be believers is therefore that a lot of the religious imagery is highly particular. One finds oneself in a mental world in which the earth is at the centre of the universe and where even particular places and times are supposed to be of immense importance.

Of course theologians can claim that theological conceptual schemes can advance and be modified just as philosophical and scientific ones can. However, the particularity of what are not necessarily the essential features but of the general ambience of the scriptures of the great monotheistic religions may be worrying to traditional theists. Obviously those who persecuted Galileo were worried. Even the heliocentric universe was tiny compared with the universe as it is known in modern cosmology. Perhaps the discovery of the galaxies by Hubble would have been even more scary to those who fear the vast cosmic spaces.

Suppose that there are a hundred thousand million stars in a galaxy and that there are perhaps a comparable number of galaxies. That is a lot of stars in the universe. Planetary systems much like our solar system are likely to occur only around main sequence stars similar to our sun. Among main sequence stars at least two-thirds are double (or triple) stars, and life is not so likely to emerge in planets of these type of stars. The chance of *intelligent* life emerging is even less. Evolution on earth could easily have taken a different turn. It is likely that an impact by an asteroid 65 million years ago led to the earth being covered by dust clouds and so to something like an envisaged 'nuclear winter'. It is believed that this was the cause of the extinction of the dinosaurs, and so indirectly led to the dominance of mammals. Our planet Earth is the only one in the solar system which is suitable for the evolution of intelligent life. So even if there are very many other planetary systems in our galaxy, few might have been suitable for the evolution of intelligent life. Even our solar system is due to a series of happy accidents. Stuart Ross Taylor, in his book *Solar System Evolution: A New Perspective*[107] explains recent ideas

which go as follows. An irregular bit of a larger molecular cloud broke off in such a way that it took a special form and was rotating about its centre. This irregularity allows an escape from the problem of the distribution of angular momentum between planets and the sun which beset La Place's nebular hypothesis and its descendants. The dust grains accreted gravitationally into planetesimals and these into planets, the whole process involving collisions between the various bodies. Collisions indeed form an important part of the story, and account for many of the varying characteristics (such as differing inclinations to the ecliptic plane of the various planets). A large planet-sized object is supposed to have collided with the earth. The resulting splash of molten material formed the Moon, about 80 per cent of whose mass comes from material from the impacting body, so that the Moon's constitution is dissimilar to that of the earth. The impacting body was destroyed in the collision and the collision stripped away the early atmosphere, which eventually was replaced (through gas emanating volcanically from the earth) by an atmosphere suitable for the evolution of life. This collision was a lucky accident for the prospect of life. Another lucky accident is that of the formation of the huge planet Jupiter in its position outside the asteroid belt, since it forms a gravitational barrier to comets. Without Jupiter perhaps a thousand times as many would impact on the earth making conditions for life very difficult.

The main matter of interest is how the formation of the solar system depended on a lot of accidents, and how uniformitarian theories of its origin are out of place. All the planets are importantly different from one another. So even if there are many such systems in the galaxy, few might be suitable for life and still fewer would develop intelligent life. Indeed Taylor is of the opinion that we are alone in the universe.[108] Remember that we need not only to multiply together all the probabilities of lucky astronomical accidents which led to our solar system containing a planet suitable for life, but we have to multiply this very small probability with the probabilities of all the lucky biological accidents in the biological evolutionary process. We then need to compare the reciprocal of this very small number with the huge number of stars like our sun in the galaxy, multiplied again by the huge number of galaxies. It is obviously very hard to estimate the probabilities and the final answer.

Before I heard a lecture by Ross Taylor and read his book I was of the fairly conventional opinion put forward by astronomers that there are probably hundreds of millions of planets with planetary systems suitable for the evolution of life and that we are far from being the only intelligent beings in our galaxy, let alone in the universe, and that probably there are vast numbers of planets with intelligent beings technologically far in advance of ourselves. At any rate Ross Taylor's considerations suggest that although planetary

systems might be common, those with a planet suitable for the evolution of intelligent life are extremely rare, and that the prospects of the current programme SETI (search for extraterrestrial intelligence) are very poor.

This is probably to some extent a temperamental matter, because so much guesswork and quantifying of probably unquantifiable probabilities is involved, but I find it hard to believe that we are alone in the universe, or even in our galaxy. Even if the emergence of intelligent life is rare in the extreme, the number of galaxies is comparable to the number of stars in our Milky Way system. The reason I am inclined to believe that there is much other intelligent life in the universe (in which case a lot of it will be very advanced compared to ourselves) has to do with something like Leslie's 'firing squad' argument (see section 5) being at the back of my mind. Furthermore, the probability of intelligent life in the total universe of everything that there is would become a certainty if the universe were infinite or if there were infinitely many of Carter's many universes, discussed in section 5.

While not entirely closing our minds to the possibility that we are in fact alone in the universe let us look at the question of how the existence of life on other worlds would affect the Christian doctrine of the Trinity. Suppose (for the sake of argument) that there is an incarnation on ten million other planets. Does this mean that the Second Person of the Trinity is multiply incarnated? Or would the Trinity be a (ten million and one)-ity? As far as I have been able to discover the orthodox view (such as that of E.L. Mascall) would be to take the former alternative.[109] This is a hard matter which raises a lot of philosophical problems, but no more so, perhaps, than the original doctrine of incarnation itself.

The problems that arise from the possibility of life on other worlds does seem to have been somewhat neglected by theologians. However, recently John Hick has considered the subject in his book *The Metaphor of God Incarnate*, Chapter 9, where he also refers to several other theological writers who have discussed the matter.[110] Hick's theory is quite attractive, though conservative theologians might not like the notion of incarnation to be treated as metaphorical. A very odd way out was put forward, admittedly in the imaginative context of a fanciful novel, by C.S. Lewis.[111] This was that among countless other planets containing intelligent life ours is the only one on which its inhabitants sinned and so needed a Redeemer. One may find some difficulty in believing that our planet is the only one on which intelligent life exists, but it is far more difficult to believe that if there are millions of other planets containing intelligent life, ours is the only one in which sin existed. Even if intelligent life had existed for millions of years and evolved into angelically good beings they would have had to pass through the sinful stage in any evolutionary process that is at the least likely. As was explained on p. 60, unfortunate tendencies of character (such as combativeness) are likely

to persist because they had survival value at an earlier stage of evolution, and also because there are so many more ways in which a machine can go wrong than there are ways in which it can go right.

Metaphysical Theism

Let us return from the special case of Christianity to the general question of theism itself. My arguments in this essay against any form of theism have not been apodeictic. As I remarked in section 1, there are no knock-down arguments in philosophy. Premisses and even methodology can be questioned. For example I have not surveyed all the many ways in which philosophers have tried to deal with the problem of evil. Such would involve a voluminous work. What I think we can do, instead of aiming at an apodeictic argument, is to push the person who disagrees with us into a more and more complex theory, involving more and more disputable premisses. There may be disagreement on the relative plausibilities of premisses. In the end we may agree to disagree, while nevertheless sticking to the assertion that there is an objective truth of the matter, whether or not we can agree on what it is. Sometimes a Wittgensteinian dissolution, rather than solution, of a philosophical problem may occur, but the history of philosophy since Wittgenstein has made it appear unlikely that if we think hard and long enough we will show the fly the way out of the fly bottle.[112] Metaphysics cannot be avoided. But it need not be apodeictic or entirely *a priori*.

A philosopher who thought he had an apodeictic disproof of the existence of God was J.N. Findlay. He thought that all necessity was a matter of linguistic convention, and that there was no sense in which God's existence could be necessary.[113] Any being that was not necessary might, he says 'deserve the δουλεια canonically accorded to the saints, but not the λατρεια that we properly owe to God'. In reply G.E. Hughes rightly rejected this view of necessity.[114] (Recall the discussion in section 8 of logical and mathematical necessity.) And indeed Findlay in a reply to Hughes and to A.C.A. Rainer concedes that 'proofs and disproofs' hold only for those who accept certain premisses. So ultimately we must, I think, resort to persuasion and considerations of relative plausibility.

Let me return to what I called 'the new teleology', the consideration of the 'fine tuning' and the beauty and wonders of the laws of nature, and the emergence of conscious beings such as ourselves. Paul Davies, in his *The Mind of God*,[115] holds that the universe is not 'meaningless' and that the emergence of consciousness in some planet in the universe is not a 'trivial detail, no minor by-product of mindless, purposeless forces'. The trouble with this is that a purpose must be a purpose of some person or super-person. Talk of 'meaning' or 'purpose' here therefore begs the question in favour of theism.

The evidence that Davies has is that the laws or proto-laws and the initial conditions in the universe (or collection of universes as in Carter's hypothesis) imply that conscious life is pretty sure to emerge somewhere, perhaps many times over. If no more than this is meant there is no argument for theism. ('Pretty sure' above is a bit strong if Ross Taylor is right that we are probably alone in the universe. It would be a matter of luck.)

I concede that theism is an emotionally attractive doctrine. Perhaps it even is true. But if it *is* true then the problems that I have put forward in the case of traditional theism make it likely that such a theism would have to be understood in such a way that it would differ little from what we at present regard as atheism.

Notes

1 J.J.C. Smart, 'Why Philosophers Disagree', in Jocylyne Couture and Kai Nielsen (eds), *Reconstructing Philosophy: New Essays in Metaphilosophy* (Calgary, Alberta: University of Calgary Press, 1993), pp. 67–82.
2 T.S. Kuhn, *The Structure of Scientific Revolutions*, 2nd edn (Chicago and London: University of Chicago Press, 1970).
3 See pp. 54–9.
4 See for example, Richard C. Jeffrey, *The Logic of Decision*, 2nd edn (Chicago and London: University of Chicago Press, 1983), pp. 185–7.
5 J.L. Mackie, *The Miracle of Theism* (Oxford: Clarendon Press, 1982).
6 Paul Davies, *The Mind of God* (London: Simon and Schuster, 1992).
7 John Leslie, *Universes* (London: Routledge, 1989).
8 Ludwig Wittgenstein, *Philosophical Investigations* (Oxford: Blackwell, 1953), sections 66–7.
9 Paul Davies and John Gribbin, *The Matter Myth* (Harmondsworth: Penguin Books, 1991).
10 For speculations contrary to my own on this point, see Roger Penrose, *The Emperor's New Mind* (Oxford: Oxford University Press, 1989) and *Shadows of the Mind* (Oxford: Oxford University Press, 1994).
11 For details, see J.O. Burchfield, *Lord Kelvin and the Age of the Earth* (London: Macmillan, 1975).
12 See Silvanus P. Thompson, *The Life of William Thomson, Baron Kelvin of Largs* (London: Macmillan, 2 vols, 1910), p. 1094.
13 For the speculations and objections, see John Horgan, 'In the Beginning . . .', *Scientific American*, 264 (February 1991), 100–9.
14 See for example, the first three essays in Stephen Jay Gould, *The Panda's Thumb* (Harmondsworth: Penguin Books, 1980).
15 Gerald Feinberg, 'Physics and the Thales Problem', *Journal of Philosophy*, 63 (1966), 5–17.

16 See the title article in Isaac Asimov, *The Relativity of Wrong* (Oxford: Oxford University Press, 1989).
17 William Paley, *Natural Theology* (London, 1802).
18 On this topic see the perceptive methodological article by the neurophysiologist G. Adrian Horridge, 'Mechanistic Teleology and Explanation in Neuroethology', *BioScience*, 27 (1977), 725–32.
19 Richard Dawkins, *The Selfish Gene* (Oxford: Oxford University Press, 1976).
20 Psalm 19, Old Testament Revised Version, 1884.
21 John Leslie, *Value and Existence* (Oxford: Basil Blackwell, 1979), pp. 211–13.
22 F.H. Bradley, *Appearance and Reality* (Oxford: Clarendon Press, 1897). C.A. Campbell, *Scepticism and Construction* (London: Allen and Unwin, 1931).
23 Paul Davies, *The Mind of God* (London: Simon and Schuster, 1992).
24 Cf. quotation from letter from Einstein to Born on p. 176 of Born's article in P.A. Schilpp (ed.), *Albeit Einstein: Philosopher-Scientist* (New York: Harper Torchbooks, 1959).
25 For a summary of the 'fine tuning', see John Leslie, *Universes* (London: Routledge, 1989), pp. 2–5 and 25ff.
26 Fred Hoyle, *The Black Cloud* (London: Heinemann, 1957).
27 G.J. Whitrow, *The Structure and Evolution of the Universe*, 2nd edn (London: Hutchinson, 1959).
28 G.J. Whitrow, 'Why Physical Space has Three Dimensions', *British Journal for the Philosophy of Science*, 6 (1955–6), 13–31.
29 See J.J.C. Smart, 'Explanation – Opening Address', in Dudley Knowles (ed.), *Explanation and its Limits* (Cambridge: Cambridge University Press, 1990), pp. 1–15. The metaphor of the web of belief is due to Quine. See W.V. Quine and J.S. Ullian, *The Web of Belief*, revised edn (New York: Random House, 1978).
30 Brandon Carter, 'Large Number Coincidence and the Anthropic Principle in Cosmology', in M.S. Longair (ed.), *Confrontation of Cosmological Theories with Observational Data* (Dordrecht: D. Reidel, 1974). This article is reprinted in John Leslie (ed.), *Physical Cosmology and Philosophy* (New York: Macmillan Publishing Company, 1990).
31 John Leslie, *Universes*, pp. 13–14.
32 See for example, J.J.C. Smart, *Essays Metaphysical and Moral* (Oxford: Blackwell, 1987), Essay 10 'Under the Form of Eternity'.
33 W.V. Quine, *Word and Object* (Cambridge, MA: MIT Press, 1960).
34 Andrei Linde, 'The Universe: Inflation out of Chaos', *New Scientist*, 105 (1446), 7 March 1985, 14–18. Reprinted in John Leslie (ed.), *Physical Cosmology and Philosophy* (New York: Macmillan, 1990). Linde has a later theory in which universes give birth to baby universes. This does not affect the philosophical points that I wish to make. See Andrei Linde, 'The Self-Reproducing Inflationary Universe', *Scientific American*, 271 (November 1994), 32–9.
35 See A.H. Guth and P.J. Steinhardt, 'The Inflationary Universe', *Scientific American*, 250 (May 1984), 116–28.
36 Norman Kemp Smith, 'Is Divine Existence Credible?', *Proceedings of the British Academy*, 17 (1931), 209–34.

37 Norman Kemp Smith (ed.), *Dialogues Concerning Natural Religion* (Edinburgh: Nelson, 1947).
38 Antony Flew, 'Arguments to Design', *Cogito*, 6 (1992), 93–6.
39 Cf. title of book by Paul Davies, *The Cosmic Blueprint* (London: Heinemann, 1987).
40 John Leslie, *Value and Existence* and John Leslie, *Universes*.
41 Stephen W. Hawking, *A Brief History of Time* (London and New York: Bantam, 1988).
42 F. Hoyle, *The Black Cloud*.
43 René Descartes, *Meditation* III.
44 On changes in our beliefs about angels, see Enid Gauldie, 'Flights of Angels', *History Today*, 42, December 1992, 13–20.
45 Jeremy Bentham, *Introduction to the Principles of Morals and Legislation*, ch. 17, section 1, sub-section 2, footnote. In Wilfrid Harrison (ed.), *A Fragment on Government and an Introduction to the Principles of Morals and Legislation* (Oxford: Basil Blackwell, 1948).
46 John Leslie, *Universes* and in his earlier metaphysical treatise *Value and Existence*.
47 See note 8.
48 See Ninian Smart, *Reasons and Faiths* (London: Routledge and Kegan Paul, 1958).
49 Thomas Aquinas, *Summa Theologica* I p. 13.
50 Leslie, *Universes*, p. 166.
51 For my own views on this matter, see J.J.C. Smart, *Ethics, Persuasion and Truth* (London: Routledge and Kegan Paul, 1984).
52 G.E. Moore, *Principia Ethica* (Cambridge: Cambridge University Press, 1903).
53 W.D. Ross, *Foundations of Ethics* (Oxford: Clarendon Press, 1939).
54 David Wiggins, *Needs, Values, Truth*, 2nd edn (Oxford: Blackwell, 1991), p. 137. The theory that Wiggins canvasses here contains subtleties that I here ignore as not germane to the present problem. For a discussion of the theory as I understand it (which may not be very well) see J.J.C. Smart 'Value, Truth and Action', *Ethics*, 100 (1990), 628–40, especially pp. 632–3.
55 Peter Singer, *The Expanding Circle* (Oxford: Clarendon Press, 1981).
56 See W.V. Quine, *Methods of Logic*, revised edn (New York: Holt, Rinehart and Winston, 1959), p. 97.
57 See for example, M. Heidegger, 'What is Metaphysics?' (last sentence), in D.F. Krell (ed.), *Basic Writings of Martin Heidegger* (New York: Harper and Row, 1977).
58 As reported in Norman Malcolm, *Ludwig Wittgenstein: A Memoir* (Oxford: Oxford University Press, 1958), p. 20.
59 *Tractatus Logico-Philosophicus*, translated by D.F. Pears and B.F. McGuinness (London: Routledge and Kegan Paul, 1961). See also Nicholas Rescher, *The Riddle of Existence* (Lanham, MD: University Press of America, 1984), pp. 4ff.
60 Jonathan Barnes, *The Ontological Argument* (London: Macmillan, 1972).
61 Thus W.V. Quine parses names as predicates in order to put language into the canonical notation of his *Word and Object*.

62 Jonathan Barnes, *The Ontological Argument*, p. 57.
63 Compare W.V. Quine, *Word and Object*. Compare also some of the papers by Donald Davidson, such as 'On Saying That', in which Davidson embarks on the project of showing that the underlying structure of intensional sentences is indeed that of classical first order logic. Donald Davidson, *Inquiries into Truth and Interpretation* (Oxford: Clarendon Press, 1984).
64 See Gilbert Harman, 'The Inference to the Best Explanation', *Philosophical Review*, 74, 88–95, and Gilbert Harman, *Thought* (Princeton: Princeton University Press, 1975). For a recent treatment see Peter Lipton, *Inference to the Best Explanation* (London: Routledge, 1991).
65 *Summa Theologica*, I, qa. 2, art. 3.
66 See Bertrand Russell and F.C. Copleston, 'A Debate on the Existence of God', originally broadcast by the British Broadcasting Corporation, 1948, and included in John Hick (ed.), *The Existence of God* (New York: Macmillan, 1964).
67 Stephen Hawking, *A Brief History of Time*.
68 E.P. Tryon, 'Is the Universe a Vacuum Fluctuation?', *Nature*, 246 (1973), 396–7.
69 See C.B. Martin, *Religious Belief* (Ithaca: Cornell University Press, 1959), p. 156.
70 See W.V. Quine, 'Necessary Truth', in his *Ways of Paradox and Other Essays* (New York: Random House, 1966).
71 To prevent misunderstanding I should make it clear here I count socalled 'higher order logic' as 'set theory'. Quine has called it 'set theory in sheep's clothing', *Philosophy of Logic* (Englewood Cliffs, NJ: Prentice-Hall, 1970), pp. 66–8. Whether it be called 'logic' or not the point I make about set theory applies to it, once allowance is made for the 'sheep's clothing'. Quine calls first order logic simply 'quantification theory'.
72 Especially to pure mathematicians. See G.H. Hardy, 'Mathematical Proof', *Mind*, 38 (1929).
73 Roger Penrose, *The Emperor's New Mind* (London: Vintage, 1989).
74 Hartry Field, *Science without Numbers* (Oxford: Blackwell, 1980) and *Realism, Mathematics and Modality* (Oxford: Blackwell, 1989).
75 David Lewis, *Parts of Classes* (Oxford: Blackwell, 1991).
76 'To Be is to be the Value of a Variable (or to be Some Value of Some Variables)', *Journal of Philosophy*, 81 (1984), 430–49.
77 D.M. Armstrong has pioneered such an empirically based theory of universals. See for example his *Universals: An Opinionated Introduction* (Boulder, Colorado and London: Westview Press, 1991).
78 Peter Forrest and D.M. Armstrong, 'The Nature of Number', *Philosophical Papers*, 16 (1987), 165–86.
79 John Bigelow, *The Reality of Number: A Physicalist's Philosophy of Mathematics* (Oxford: Clarendon Press, 1988).
80 William Kneale, 'Time and Eternity in Theology', *Proceedings of the Aristotelian Society*, 61 (1960–1), 87–108, and Martha Kneale, 'Eternity and Sempiternity', ibid., 69 (1968–9), 223–38. The Kneales come down on the side of sempiternity.

81 Cf. William James, *Varieties of Religious Experience* (New York: Random House, 1929), final chapter and postscript.
82 See the article on Pascal by R.H. Popkin, in Paul Edwards (Editor in Chief), *The Encyclopedia of Philosophy* (New York: Collier-Macmillan, 1967).
83 Bertrand Russell, *Why I am not a Christian* (Simon and Schuster, 1957). Edited by Paul Edwards with an Appendix on 'The Bertrand Russell Case'.
84 See William James, 'The Will to Believe', in his *The Will to Believe and Other Essays in Popular Philosophy* (London: Longmans Green, 1931), especially p. 6.
85 See Pascal, *Pensées*, edited by Louis Lafuma and translated by H.T. Barnwell (London: Dent, 1973).
86 Antony Flew, *The Presumption of Atheism* (London: Pemberton Publishing Company, 1976), ch. 1, p. 16, also ch. 5 ('Is Pascal's Wager the Only Safe Bet?'). Flew indicated that the idea of Pascal's wager can be traced back to the Islamic philosopher AI-Ghazali.
87 William James, 'The Will to Believe', p. 6.
88 Ibid.
89 William James, *Varieties of Religious Experience*, p. 22.
90 Antony Flew, *Hume's Philosophy of Belief* (London: Routledge and Kegan Paul, 1961).
91 See F. Waismann, 'Verifiability', in Antony Flew (ed.), *Logic and Language*, First Series (Oxford: Blackwell, 1951).
92 I am here indebted to an unpublished paper by W. Ginnane.
93 Thus my father calculated that there were neap tides at the time of the Spanish Armada. He did this on behalf of J. Holland Rose. See the latter's paper 'Was the Failure of the Spanish Armada due to Storms?', *Proceedings of the British Academy*, 22 (1936), 207–44, especially p. 226. (There is a misprint in the second footnote, where 'E.M. Smart' should be 'W.M. Smart'.)
94 D.E. Nineham, *The Gospel according to St Mark* (Harmondsworth: Pengum Books, 1972).
95 Reprinted in F.H. Bradley's *Collected Essays*, vol. 1 (Oxford: Clarendon Press, 1935).
96 Ibid., p. 20.
97 Ibid., p. 20.
98 Ibid., pp. 63–4.
99 C.A.J. Coady, *Testimony: A Philosophical Study* (Oxford: Clarendon Press, 1992).
100 First published 1819 anonymously. Quoted in Coady, *Testimony: A Philosophical Study*, p. 187.
101 S.G.F. Brandon, *Jesus and the Zealots* (Manchester: Manchester University Press, 1967). Also 'The Jesus of History', *History Today*, 12 (1962), 13–21, and 'The Trial of Jesus', *History Today*, 16 (1966), 251–9.
102 See Leon Festinger *et al.*, *When Prophecy Fails* (Minneapolis: Minnesota University Press, 1956).
103 'Free Will as involving Determination and Inconceivable without it', *Mind*, 43 (1934), 1–27.
104 J.L. Austin, *Philosophical Papers*, 2nd edn (Oxford: Clarendon Press, 1970), p. 180.

105 See for example, C.A. Campbell, 'Is "Freewill" a Pseudo-Problem?', *Mind*, 60 (1951), 441–65. For reference to controversy about this between Campbell and myself see J.J.C. Smart, *Our Place in the Universe* (Oxford: Blackwell, 1989), ch. 6.

106 See George Schlesinger, 'The Problem of Evil and the Problem of Suffering', *American Philosophical Quarterly*, 1 (1964), 244–7.

107 Stuart Ross Taylor, *Solar System Evolution: A New Perspective* (Cambridge: Cambridge University Press, 1992).

108 Using somewhat different reasoning John D. Barrow and Frank J. Tipler have concluded that we are probably alone in our galaxy. Still, there are a lot of galaxies, and so we could be far from alone in the universe. See Barrow and Tipler, *The Anthropic Cosmological Principle* (Oxford: Clarendon Press, 1986), ch. 9.

109 See E.L. Mascall, *Christian Theology and Natural Science* (London: Longman, Green, 1957), p. 43.

110 John Hick, *The Metaphor of God Incarnate* (London: SCM Press, 1993), ch. 9.

111 C.S. Lewis, *Perelandra* (London: Bodley Head, 1967).

112 Wittgenstein, *Philosophical Investigations*, section 309.

113 'Can God's Existence be Disproved?', in Antony Flew and Alasdair MacIntyre (eds), *New Essays in Philosophical Theology* (London: SCM Press, 1955).

114 Reply to Hughes and Rainer in Flew and MacIntyre, op. cit. See also the original reply to Findlay by Rainer. Rainer thinks that we know God's necessity by analogy and only God himself directly apprehends this. Findlay thinks that this is stretching the doctrine of analogy a bit far.

115 Paul Davies, *The Mind of God*, p. 232.