

God, Science, and the New Atheism.

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The Basic Idea of Personal Being.

Belief in God, in a conscious and intelligent author of nature, is a very natural and understandable belief. Human beings are aware of themselves as agents, as being able to bring about states of affairs because they think they will be enjoyable or worth-while in some way. They are aware of themselves as having perceptions, thoughts, and feelings, which give them knowledge of an objectively real world, but which have an important kind of individual uniqueness and subjectivity, not directly knowable by anyone else. They also know that there are other conscious agents with whom they interact on a daily basis.

The idea of a subjective consciousness that is not directly accessible by others, but that has causal power and that relates to others by means of physical behaviour and by the use of language, arises almost inevitably as soon as reflection on human existence begins. By contrast, the idea of a wholly unconscious physical reality that proceeds in accordance with regular yet impersonal laws, and that has no knowledge of or concern with human persons, is a theoretical idea that requires a rigorous abstraction from ordinary human experience.

The fact that an idea is natural does not entail that it is true. But the idea of God, of a conscious personal agent that has purposes in and communicates through the physical cosmos, is not some sort of irrational and arbitrary leap of blind faith. It is not like believing, as Bertrand Russell once suggested, that an invisible and intangible tea-cup circles the earth, or, as some Internet sites suggest, that an invisible spaghetti monster exists in outer space.

These would be totally arbitrary suppositions, with little reason to accept them. God is not like that. Our primary sense of causality is personal agency, and insofar as causes exist in nature, we have reason to suppose that they are personally caused. Our primary sense of existence is founded on our own subjective consciousness, and that is a reason for supposing that consciousness may be a basic characteristic of reality. And if events in history and in the personal lives of humans give any sign of pattern or purpose or meaning, that is a reason for taking them as expressions of personal agency.

The point I am making is a simple one, though it can easily be overlooked. It is that belief in God is not a dispassionate hypothesis which tries to explain why things are as they are, by providing an objective, publicly demonstrable, theoretical explanation. To look for such an explanation is already a more sophisticated and abstract procedure than is involved in ordinary belief in God. Belief in God is more like an immediate reactive attitude to things we encounter in experience, more like belief that we and other persons exist. But it generalises the notion of personal agency to cover the whole experienced universe, treating the universe, or at least the universe as known by us, as the 'body' or physical expression of an underlying personal agent, known in and through the universe.

Just as there is a basic way of seeing physical bodies as expressions of personal agency, so there is a basic way of seeing the physical world of our experience as an expression of personal agency. This is because our primitive sense of causality, of existence, and of interaction, involves the idea of personal agency. These, I suggest, are reasons – they provide evidence – for thinking that a God exists, intentionally creates the universe and communicates through it.

Of course we need to go on to ask if they are good enough reasons to compel belief, or if they may not rather be misleading first impressions. But I think it is important to see that we do not start with the belief that we live in a wholly material world, in which the existence of a God would be a superfluous and even incoherent add-on. We start with belief in a world of passionate personal interactions, and it is entirely reasonable, in default of countervailing reasons, to think that the whole physical world we encounter expresses and mediates to us an active and communicative personal reality.

Religion and Science – Different Magisteria?

The practices of religion and faith build on this initial belief, and they aim to establish or sustain some form of positive relationship to the supposed personal reality or realities underlying the experienced world. Though it is extremely difficult to characterise religion briefly, my own study of early and classical religions leads me to think that religious cults provide symbols, narratives, and rituals that encourage devotion to specific values taken to exist objectively, symbolised by god-images. They claim to evoke some positive experience of a personal reality or realities, transcending the physical world. And they claim to offer a way of overcoming or mitigating the problems and imperfections of ordinary human life, by conscious relation to these personal realities.

These activities are not scientific. They are concerned with values, with subjective, not universally shareable, experiences and attitudes, and with personal commitments to ways of living in relation to powers that can only be encountered through personal relationship. I think it is quite mistaken to see religious practices, whether simple or sophisticated, as early attempts at science – as trying to explain why thunder occurs, for example, by looking for some hidden physical causal structure, perhaps supposing that some sky-being walks on the clouds. That example may seem fantastic, and it is – but it has been proposed by at least one modern atheistic philosopher as an allegedly serious account of early religion.

This, however, is an example of how some modern critics of religion seem wilfully to misrepresent religion as some sort of outmoded science. They rarely study religious phenomena seriously, or try to understand what motivates intelligent people, whether in tribal forests or international cities, to have religious beliefs. A serious study of religions will show that most believers are not motivated by questions of how things work. They do not spend long hours closely observing and recording their observations, or trying to discern some pattern of regularities in physical behaviour, looking for hidden causal structures, or trying out ways to control and improve their environment. These are the marks of a true scientist.

Many religious believers are in fact quite disinterested in such things. Their longest hours are spent with their eyes shut, meditating or praying. They often show a marked indifference to their physical environment, preferring to concentrate on subjective experiences, ritual performances, and moral practices. They may even regard the physical environment as unimportant or illusory, and close investigation of it as an irrelevance to the really important business of cultivating good relationships with the gods.

Some assertions about God can superficially sound like scientific attempts at explanation. If we say, 'God created the world', that sounds like a scientific explanation. It explains why the world is the way it is, and why it exists, by positing a hidden cause, God. But the surface grammar is misleading.

That is because scientific and religious explanations are different in kind. Scientific explanations generally refer to data that are in principle observable and publicly testable. They can ideally be formulated in mathematical equations, or at least the data they deal with can be measured and quantified. Even ethology, one of the least theoretical sciences, observes and records the behaviour of animals in the wild, varies environmental conditions to verify observed generalisations about animal behaviour, and attempts to quantify its data as much as possible. Such observations usually give rise to predictions, and help us to control various phenomena.

A good deal of physics and biology consists in positing atomic or molecular structures whose existence will account for closely observed physical behaviour. Experiments are devised that may verify the existence of such structures, and schemes of classification are invented that enable us to understand them more clearly. Good scientific theories enable us to predict and control physical processes, to produce nuclear fission or genetic control mechanisms.

I would not wish to force all sorts of science into one Procrustean model of explanation. But it does seem to be true that there are some – not many – people who have naturally scientific minds, and an aptitude for science, and in general we know how to tell who they are. A good scientific mind will try to take a complex entity apart, put it together again, try to see how it works, and perhaps improve it. A good scientific mind will not be terrified by mathematics, but will be happiest when some elegant mathematical equation can be found to embody the results of close and repeated observation. And a good scientific mind will enjoy experimenting, and seeing what happens when new experimental techniques are devised. Observation, experiment, careful testing, elegant classification and mathematical modelling, are primary scientific skills.

There are many humans who have no such skills, and who are not personally interested in science. Many of them study subjects like literature, art, music, or history in our Universities. They typically have different intellectual skills and interests. In the study of music, for example, they may be interested in how to produce beautiful sounds, in the different sorts of beauty that are expressed in music, in the ways in which musical styles may express particular emotions or reflect specific cultural interests, or simply in learning to appreciate and perhaps create different sorts of music.

There are many overlaps with scientific skills. It is not as if they are wholly distinct intellectual activities. Yet the approach of a composer is different to that of, say, an acoustical engineer. One is concerned primarily with the appreciation and subjective impact of a set of sounds, with the intrinsic experienced value of music. The other is concerned with explaining how to produce specific sounds, and how to obtain desired effects and experienced values most efficiently. It would seem obviously helpful if both sets of skills were used. There is little point in opposing them to one another, as if the technical expertise and the aesthetic experience were somehow in competition.

I have used the example of music to overcome the impression that the relation between science and religion is an especially important and unique duality in human experience and activity. I want to suggest that scientific skills and activities are just one set of human skills, possessed to a high degree only by few, alongside many other sorts of skills – in the arts, in practical wisdom about human affairs, in personal relations, in philosophy, and in religion.

A Religious Doctrine of Creation

When a believer says, ‘God created the world’, this does not show that an average church-going congregation possesses advanced scientific skills and interests. The statement is not the result of close observations carried out in many different situations, of repeated experimental testing, and of attempts to compete with Stephen Hawking in providing a mathematical model for the Big Bang. Religious statements about creation are not just bad science. They are not science at all.

To see what they are, let me return briefly to music. Some, but not all, musicians would say that music has a transcendent dimension. That is, the sounds express a truth about or an insight into reality that cannot be conveyed in any other way, but that communicate an apprehension of beauty, disclosing something real and significant about the world that humans experience. Great music conveys insight into reality, gives a personal apprehension and understanding of what it is like to be human, and what the world is like in its deepest reality, as perceived from that human point of view. It is a special sort of awareness. The nineteenth century theologian Friedrich Schleiermacher called it ‘the taste and sense of the infinite’. Schopenhauer thought that music could lead to ‘a peace that is higher than all reason, (an) ocean-like calmness of the spirit’, and that this disclosed a deep truth about reality.

These may be rather Romantic views of music, and some would react strongly against them. At their worst, they may be seen as a Classic FM view of music – aids to relaxation. But there is more to it than that. Perhaps great creative artists can uncover a vision of reality that shows an inner spiritual quality that can be evoked but never verbally described. That, said Schleiermacher, is one form of a sense of God, and it is not accidental that it is evoked by creative effort and disciplined attention, by that which is most personal and inward in human life.

I suggest that the phrase, ‘God created the world’ is more like this than it is like scientific explanation. For many people, the world that we see and touch and feel is a world of

appearances, dependent on a deeper underlying reality of Spirit, of consciousness, wisdom, and beauty. The whole of space and time is an expression, half-revealing and half-veiling, of this time-transcending, eternal reality. The sense of such a transcendent presence, known in and through the finite universe – what the later Schleiermacher called ‘the sense of absolute dependence’ - is part of the sense of God. To have that sense is to believe in creation.

‘God created the world’ does not give an ordinary causal explanation of some hidden physical reality that preceded this universe in time, that we could experimentally test, describe in a neat mathematical algorithm, and perhaps use to create improved universes in future. Creation speaks of the dependence of every time upon time-transcending Spirit, and it is something that is sensed, apprehended, or felt, rather than posited as a hidden causal structure. Indeed, God could not be a hidden causal structure, since God is not at all physical or subject to any causal laws, which belong only to created universes.

That is basically why God is not, and could not be, part of a strictly scientific explanation. God is not publicly observable, is not subject to experiment, does not act in accordance with mathematically describable regularities, and God’s acts cannot be predicted in measurable or testable ways.

For that now virtually extinct tribe of philosophers, the Logical Positivists, that meant that the existence of God could not be a matter of fact. This is a view repeated by Richard Dawkins when he says that the existence of God must be a ‘scientific hypothesis’. Matters of fact, the Positivists said, must be verifiable or falsifiable by sense-experiences, at least in principle. Even if that were true, however, it would not mean that all factual statements are scientific statements. For example, the statement that I am now standing in a room in Cambridge is certainly a factual statement, but I would not expect anyone to dignify it by calling it a scientific statement. It is not part of any theoretical explanatory scheme. It is a common-sense statement, and modern science is often far from common-sense, as is readily seen if you try to read texts on quantum cosmology.

Axiological Explanation

Is ‘God exists’ a common-sense statement, or part of a scheme of theoretical and publicly testable explanation of physical structure or behaviour? Well, it is not quite either. The term ‘God’ is highly theory-laden, and while it is based on the common-sense reasons adduced at the beginning of this paper, on the sense of transcendence I have just adduced, and often on a positive experience of the benefits of religious practice, it has moved some way beyond that in the works of major theologians. It has become part of an explanatory scheme, but not a scientific explanatory scheme. The French have a name for it. It is axiological explanation, which in the case of ‘God’ is generalised to cover the whole cosmos.

Axiological explanation is the explanation of a process in terms of value. It has four major elements. First is the identification of some state or process as of intrinsic value, as being worth choosing for its own sake alone. This entails the second element, which is awareness of a range of alternative states on the basis of which such an evaluation could be made. Third is the assumption that a choice can be made. And fourth is the conscious appreciation and

enjoyment of the value, without which all values would remain merely hypothetical rather than actual.

Such explanation presupposes that intrinsic values do exist, that there is consciousness both of their possibility and actuality, that purposive choices can be made (choices made for the sake of realising a specific value), and that there are feelings or desires that can in principle be satisfied.

Axiological explanations are not usually used in the natural sciences. Strictly physical sciences do not ask whether anything is of intrinsic value, they set aside questions of consciousness and of subjective feelings, and they are extremely wary of speaking of purposes or goals in natural processes. The human sciences, like some forms of psychology and economics, may introduce such topics, but they usually retain a primary interest in recording publicly observable behaviour, in collecting data that can be measured in some way, and in attempting to frame significant generalisations that can be tested in varying contexts. They are usually content to record trends and correlations rather than to frame precise 'unbreakable' laws, and they are usually keenly aware of the many exceptions and unique cases that will qualify their general conclusions.

To give an axiological explanation of the whole cosmos would be to identify the intrinsic values that it realises, to suppose that the cosmos is selected from a number of alternatives precisely because it realises those values, and therefore to postulate that there is a consciousness – call it 'God' - that envisages, selects, and appreciates those values. This could not, as in the human case, be a matter of recording the publicly observable behaviour of such a trans-cosmic consciousness, or of measuring its behaviour, or of framing testable generalisations about it that would apply to all gods of the same sort, at least not if there is in principle only one God.

God is by most definitions a unique case, and is not a physically observable object, so it is hard to see how any physical descriptions or scientific generalisations could be offered in the case of God. This means there could be no scientific explanation of God's actions. Nevertheless, God could function as an explanation of why the cosmos exists as it does – namely, for the sake of the values that it realises and that God, and perhaps other agents, can enjoy.

Once God has been introduced as a key concept in an axiological explanatory scheme, it becomes unsatisfactory to regard God as one personal being among others, who just happens to exist and be what God is. God's consciousness is utterly inaccessible to humans, since God has no locatable physical body to express divine thoughts and feelings. Moreover, it is a consciousness that is not dependent on some complex physical structure like a brain, so it has a sort of causal priority over matter that is quite unfamiliar to us. God does not know things, as we do, through sense-organs. God's knowledge is direct and unmediated, and it will cover not only the whole universe, but also all the alternative universes that could possibly exist.

Moreover, God's desires and acts will not be whimsical or arbitrary. God will discern the true nature of all intrinsic values, and God's creative acts will be governed by that

discernment. Thus for most theologians, as for Plato and Aristotle, the being of God will itself be of supreme intrinsic value, since it contemplates all possible values without change, frustration or decay. God is the supremely Good and Beautiful, and that is, from an axiological viewpoint, the best of all reasons for the existence of anything.

Similarly God's agency would not be one among others, but would be one source and origin of the whole cosmos. As such it would be beyond space and time, as their origin. Its knowledge and agency would thus be vastly different from ours. In the case of God, uniquely, there is no question of selecting one specific God from a set of possible alternatives, since the being of God already contains every possible alternative in itself, and without God no possibilities would exist. So God, the supremely Good, does not just happen to exist by chance. As the cause of all time, change, and possibility, God cannot be brought into being or changed or destroyed. If there is a God, then God cannot fail to exist.

It is doubtful whether such a being should be called a 'person' in any normal sense. The Supreme Good that cannot fail to be, that is self-existent and perfect in actuality, is as far superior to human consciousness and personality as our consciousness is to that of a mouse or a beetle. Such a timeless, changeless and ultimate conscious cause of all would not have a particular personality, capable of developing and of being influenced by others. Yet, in having some form of consciousness and purposive causality, it would not be less than personal. So it can be seen that the theological idea of God is a rational development of the basic sense of God from which theistic belief naturally begins.

The Legend of the War of Science and God

I suggest that this developed theological idea of God as the supreme case of cosmic axiological explanation places the original and natural idea of God as a personal basis of the universe in a coherent and elegant explanatory scheme. To assert the existence of such a God is certainly to make a factual claim, a claim about how things are. God is the spiritual creator of the physical universe. But this is not a scientific claim. It does not offer any particular physical explanation of how the universe came into being, and it does not offer publicly verifiable and experimentally testable evidence for the existence of God.

However, it would be quite wrong to say that it is irrational, or that it is based on no evidence. Belief in God is rational, because it is based on our most basic intuitions about consciousness and intentional agency, and because it can be developed as the key concept of a coherent and elegant metaphysical worldview. It is based on evidence, the evidence of personal conscious experience, of experience of value, especially in morality and art, and experience, within a religious context, of liberation from egoism and conscious unity with a supreme Good.

Not all good evidence is public or experimentally testable. We all know our private thoughts and feelings in ways no-one else can. And it would actually be immoral to devise experimental tests for whether people we know really love us. The deepest personal relationships depend upon commitment and trust, upon the cultivation of a rich inner complex of thoughts and feelings that we can never fully express, and upon loyalties that go beyond what we could strictly demonstrate to be the case.

Ironically, Logical Positivism, the philosophy that made verification the lynch-pin of its whole system, was unable to establish the possibility of public verification, since it remained always uncertain whether the public even existed, as a set of other minds not directly verifiable by the senses. Verification of some sort is important. But why should it be limited to external sense-experience, and why should anyone insist that it has to be conclusive, in a world as transient and ambiguous as this? Intimations of transcendence and of value are sorts of verification. Science does not deal with them, but there is no reason for science to deny them. The proper concerns of science lie elsewhere.

Why, then, should there have arisen in the last few years a group of writers, usually with no great interest in and little respect for philosophy, who are resurrecting the rather old and historically exploded legend about a war between science and religion? I think it is mainly because of a rejection of personal experience as a reliable source of knowledge, and the consequent down-grading of value, consciousness, and purpose to being subjective and causally inoperative by-products of a wholly material reality, of which science gives the only reliable form of knowledge.

It is extremely odd to despise philosophy and yet to rely on such a very highly disputed philosophy as materialism. To say that the whole of conscious experience, with its rich and value-laden content, is either reducible to physical processes in the brain or is wholly causally dependent on such processes, is a hypothesis that is far from being established scientifically, so no view which purports to rest only on the well-established findings of science should assume it to be true. It rests on a commitment to philosophical materialism, which seems to many philosophers, including me, to undermine the very basis of human knowledge, which in the end lies in conscious experience.

Materialism is indeed self-contradictory if it asserts as true the proposition that ‘only public observations of physical phenomena in space and time can count as evidence for true beliefs’, since the evidence for the truth of this proposition cannot be any set of public observations. It will not do to say that the proposition is not a truth, but simply a declaration that one will not count anything but public observation as evidence. If such a declaration is to be reasonable rather than quite arbitrary, it must be based on something like the consideration that only public observations provide useful or fruitful knowledge. But that begs the main question at issue: are our subjective experiences of value and transcendence, our struggles to understand our own lives and learn how to live well, all useless and fruitless? Are our often agonised attempts to find meaning in our lives, to face up to the anguish of despair and death, to find something worth-while in our inner struggles, to be consigned to being pointless by-products of unconscious material processes?

Perhaps here we touch the real heart of the New Atheism – a rather old atheism in fact, that reached its zenith with Nietzsche and Marx. For this is not just an abstract philosophical debate between idealism and materialism. It is a passionate debate about the value and meaning of human life and experience.

For the New Atheists belief in God is a virulent disorder of the mind and heart, and it is to be exterminated with every available rhetorical device. That is partly why the debate can get so heated, and why atheists can use such emotive language about believers, calling them not just people with a different philosophical view, but ‘unthinking’, ‘mendacious’, ‘dim’ and ‘deluded’. What is at stake is what it means to be truly human. Is it a matter of self-cultivation and discipline, leading to world-renunciation and inner mindfulness? Or is it a matter of facing up to the moral neutrality of the world and being bold enough to live without delusions? Things get even worse when this difference is put in terms of the acceptance or rejection of a supreme moral agent, so that you either see atheism as a rejection of life’s deepest meaning and obligation, or theism as a psychopathic and infantile pursuit of an illusion.

For some people, like Sartre, the idea that there is an invisible person watching, and probably criticising, everything you do is unbearable. It is incompatible with human freedom, and reduces human beings to fearful, cringing and sycophantic ciphers. Nietzsche, too, thought that religious believers were life-haters and deniers of joy and creativity. Freud and Marx viewed much religious belief as obsessional neurosis, or as a way of keeping the oppressed content with their miserable lot.

A recent advertising campaign on the London busses expresses something of these feelings: ‘There is probably no God – now stop worrying and enjoy your life’. What they did not say was: ‘God does not exist – why not kill a few people for fun?’ The critics of God see the moral ambiguity of religion, but completely fail to see the moral ambiguity of atheism. In face of Hitler, Mao Zedung, Stalin, and Pol Pot, and of two world wars that killed millions of people without any regard to religion, they claim that a world without religion would be much less violent and more tolerant. The record of human history, in which people kill each other for a huge variety of mostly absurd reasons, gives little support to such a pious hope.

What they reject is any idea of a human purpose that is imposed on authority. What they overlook – though Nietzsche saw it – is that a human life without objective purpose is a life where there is nothing to stop one seeing compassion and pity as options mostly adopted by the weak, and conscience as an obsolete relic of past evolutionary success, to be resisted by the strong. We do not have to see life that way. But it could not be called an unreasonable option.

Science and the Pointlessness of Nature.

The struggle between theism and atheism is not at all about science versus faith. It is the age-old clash of passionately held views about the nature and meaning of human existence, about what sort of life is humanly authentic, about what it is to live well.

Yet the facts are not irrelevant to this issue. And does science not show that nature is cruel, purposeless and pointless? No, science does not show that! Of course if we believe that the cosmos has a purpose – to produce distinctive sorts of value – then examination of the cosmos is relevant to whether there are such values, whether it is reasonable to see the

cosmos as directed to producing them, and whether it is such that an intelligent consciousness could have created it.

Scientific observation of the cosmos brings out some values very strongly – the elegance and ordered complexity of the laws of nature, the beauty of the galaxies, the creative emergence apparent in the majestic processes of cosmic evolution, the incredible integration of simple parts into complex organised wholes, the development of understanding and appreciation in three pounds of grey matter in the human skull. Science is not an emotionless discipline, and most scientists are inspired with amazement and awe by the sheer grandeur of the universe.

I cannot understand Steven Weinberg's comment that the understanding of such beauty and complexity is pointless, when that is precisely one of the things that gives the universe a point or intrinsic value. His comment could be an expression of the belief that such experiences may lose their attraction, that they are purely subjective, that they will not last long, that they occur rarely and to few, or that they are outweighed by the suffering that seems an inevitable part of the universe that produces them.

It has to be said that some people may gaze at the stars and find the prospect of studying them infinitely boring. Yet it surely seems right to say that a more appropriate response would be one of wonder and deep appreciation. There is an appropriate human response, even though many humans may fail to appreciate it. The same thing is true of our response to music and art. Some people dislike music or simply have no interest in it. For them a musical life would seem pointless. Yet for others it is in music that we reach depths of feeling and understanding that are infinitely worthwhile. As we relate to other persons, we may feel that in sympathy, compassion, and love we find something deeply appropriate and worthwhile. Yet some people hate others or see them as objects to be used or feared, and find close personal relationships to be a form of Hell on earth (Sartre's play 'Huis Clos' expresses this perfectly).

A fundamental element of belief in God is that there is intrinsic and objective value in beauty, intellectual understanding, creativity, and empathetic and co-operative personal relationship. For a theist, those values are instantiated supremely in God, and the universe expresses some aspects, images, or reflections of them, insofar as they can be embedded in time. Human fulfilment consists in shaping human awareness to appreciate them more fully, to celebrate them, and to create new temporal expressions of them. This is what gives human existence its purpose – as the Westminster Confession puts it, the human purpose is 'to love God and enjoy him forever'.

The world religions are well aware that humans often reject this purpose, and find life valueless. Most religions exist precisely to recall humans to awareness of purpose and value in life. It is not an objection to the existence of an objective purpose of realising specific intellectual, aesthetic, moral, and spiritual values that many or even most people do not recognise or achieve such a purpose. It is enough to point out that many such values exist, are reasonable goals of human action, and would, if achieved even in part, give to the cosmos a very great value that could plausibly be seen as one goal of creation.

The hardest problem for any theist is to account for the existence of death and suffering in the cosmos, if it is created by a benevolent God. This is not a new scientific problem, but an old philosophical problem of rational consistency. The sciences do, however, adduce some relevant facts. One of the most significant is the discovery that destruction and suffering seem to be essential and ineliminable parts of the cosmic process. Without the destruction of stars, heavy atoms would not form. Without the law of entropy or universal long-term decay, temporal process would have no direction. Without the competition of species for survival, the selective effects of evolution would not occur.

The emergent properties of the cosmos come about through a sort of creative exploration of possibilities that inevitably involves failures as well as successes. In the light of much modern science, it becomes plausible to say, as Steven Weinberg does, that humans, as the emergent carbon-based life-forms we are, could not exist in any other universe than this, with its laws of gravitational attraction, electro-magnetism, strong and weak nuclear forces, and entropy, that entail destruction as well as creative emergence throughout the universe.

God might have created another universe, but it would not have us in it. So if God wants us to exist, with the distinctive values we can realise, this is the universe there has to be. This is not a scientific remark, but perception of the interconnectedness and destructive-creative polarity of the universe derives from a plausible interpretation of modern science.

In this way, discoveries about the nature of the universe may affect our conception of a personal creator. It is implausible to think of God directly intending every part of this universe to be as it is, since much in the universe is either destructive or random (not fully determined). But it remains plausible to think that God has created the laws and processes of the universe, for the sake of the distinctive sorts of value the universe will produce. God sets up basic structures in the cosmos that will guarantee the achievement of a desired goal, but also allows enough indeterminism within those structures for intelligent creatures, when they evolve, to make reasoned choices between alternative futures. It is plausible to think that the ideal goal that exists in the mind of God will have some specific causal influence on the physical processes of the universe. We may find it extremely difficult to conceive of how such influence will be felt, since we lack a theoretical model that is adequate to it. But if we have made the initial postulate of God, the observed facts seem compatible with a view that sees God not as determining every event, and not as interfering occasionally in a closed and complete physical system, but as exercising a general attractive or teleological influence that may be felt as a propensity to life, consciousness, and intelligence in an open and emergent universe, that will be more apparent in some crucial instances than in others. God's influence on the world might be real, and yet limited by other causal factors that are necessary conditions for the existence of carbon-based intelligent beings.

The Priority of Spirit

Such a God could not properly be called 'cruel' or 'malevolent' or 'inefficient'. But there may remain an uneasy feeling that God is largely indifferent to the inevitable sufferings of sentient beings in the universe, or that the undoubted values the universe realises are bought

at too high a price in the sufferings of sentient beings. For just this reason most of those who believe in God, in the priority of the spiritual over the physical, have affirmed that the lives of human or sentient beings are not confined to this physical cosmos. God is Spirit, and knows and remembers all that occurs throughout every physical cosmos there may be. And though we are necessarily born as the individuals we are in this cosmos, God may have the power to re-embodiment us in other forms of being.

The principle of axiological explanation states that God creates this cosmos for the sake of its distinctive goods, and it may be, as Spinoza seems to have thought, that the evils of the cosmos are necessary to its existence, and there is nothing to be done about it. Yet if God creates for the sake of good, if God has some choice in the worlds that God creates, and if God has the power to bring good out of evil, then a more satisfactory axiology would be one in which all the evils of this cosmos could be used to realise further sorts of distinctive good.

Thus in the world religions belief in rebirth or resurrection arises, to affirm the possibility that sentient lives may continue in God, or in another realm that God creates, where all the evils of this world, for every sentient being which has suffered them, could be used to realise immensely greater forms of goodness. If a person, after a life of suffering in this world, could be assured of the possibility of an endless life of immense happiness; if that person could see how their suffering was inevitable, given the world as it is, and that they otherwise could not have existed; and if the goodness they will experience after earthly life uses their earthly life in some positive way to realise God's good purpose; then I think they could unhesitatingly say that their creation was very good, and worthy of total affirmation.

Of course science can establish none of this. Belief in afterlife is founded on present experience of the goodness of God, in the Christian case on testimony to the resurrection of Jesus and trust in God's promises, on an affirmation of the time-transcending value of personhood and its potential for good achieved through moral and creative striving, on an affirmation of the categorical demands of morality, and on commitment to a spiritual view of existence. What the sciences can do is to ask whether the observed universe is compatible with or even points towards the truth of such a factual but non-scientific claim. For my own part, I am certain of the compatibility, and believe that the intelligibility of being, which science presupposes, is a strong pointer to belief in God.

Conclusion

The so-called 'new atheists' argue that acceptance of science is incompatible with belief in God. I have shown that the case has not been made. But there are five important respects in which these writers fail to meet the canons of rationality that they supposedly insist upon.

They have no initial sympathy with religious language, practices, or beliefs, and thus neglect the first principle of critical rationality, which is to appreciate and state one's opponents' views as fully and fairly as possible.

They do not admit the limits of scientific theory, and that there are many factual questions which fall outside any such theoretical framework.

They do not see or admit the philosophical weaknesses of materialism, and the strength of more theistic views, which have been almost universally espoused by the Western philosophical canon.

They fail to draw an important distinction between the well-attested findings of natural science and the wider worldviews of a philosophical nature, like materialism, that remain underdetermined by science.

And they have a deeply emotional antipathy to the idea of a moral and spiritual purpose for human life, which antipathy is rooted in a view of religion as anthropomorphic, literalistic, life, joy, and freedom-denying. To characterise all religion in this way is to fail to make important discriminations between various kinds of belief in God.

Belief or disbelief in God, like all beliefs entailing definite practical commitments, can be a highly emotional matter. But there is a place for reason in considering such beliefs. It is ironic that those new atheists who like to place themselves under the banner of reason, themselves break some of the basic canons of rational discussion, and that they espouse a worldview that makes it very hard to justify the value of rational enquiry as a means to discovering truth.

‘Reason is the slave of the passions’, wrote David Hume, one of the few anti-religious philosophers in the classical Western canon. That, perhaps, should be the motto and the epitaph of the new atheists, who claim to be eminently rational while proposing that reasoning is, in the words of Francis Crick, ‘no more than the behaviour of a vast assembly of nerve cells and their associated molecules’, and who claim to devote their lives to a resolute search for truth, while truth is for them nothing but an accidental by-product of past struggles for survival. There must be something wrong somewhere!

The lecture was followed by questions from the audience and later a dinner/discussion at St Edmunds College. A transcript of the discussion follows. The contributors are described at the end of the discussion.

God, Science and the New Atheism

Denis Alexander: I am delighted that everyone could come to this dinner and discussion, and we are now going to move to the next phase of the evening. Peter Lachmann has very kindly agreed to start us off with a few thoughts and responses from the lecture this evening, so I will now hand over to Peter.

Peter Lachmann: Thank you very much for your lecture. I come at this from a somewhat different angle as you will see from the title of the most recent thing I have written on this topic “God, to be or not to be, that is not the question”; and I will defend to you, briefly, the view that it actually matters less whether or not God(s) exist than it does that they are obeyed. That is what is necessary for their function in religion. I will try to explain why that is my view.

There is a spectrum of attitudes to the world between faith (or fideism) on the one hand and scepticism on the other, which applies not only to science and religion but also more generally.

Fideism can be described by the motto “*Credo quia absurdum*” or “I believe because it is absurd”, a quotation from Tertullian which makes the point that belief does not require its object to be reasonable. There is indeed no challenge in believing something reasonable; the challenge lies in believing something that is absurd or impossible. Scepticism, at the

other end of this spectrum, can be described by the motto of the Royal Society – “*Nullius in verba*” which, freely translated, means “*Don’t believe anything just because somebody told you it was so*”. Sceptics need evidence.

While religion has been the traditional battleground between faith and scepticism, in recent times other topics – alternative medicine, genetically modified crops and vaccinations being examples – have provoked confrontation between the two.

However, I am neither a “new atheist” nor a particular admirer of Richard Dawkins. I hold the view that religions have an adaptive function in the cultural evolution of group behaviour. [Tom Blundell: I think Dawkins thinks that as well. Peter Lachmann: I do not think he does, for a reason I will return to.]

In bees, the control of those aspects of behaviour that distinguish different colonies is entirely genetic. If a beekeeper doesn’t like the way a colony behaves he introduces a newly-mated queen from a well-behaved colony. The new workers that develop from her eggs learn nothing from the workers they grew up among but behave according to their genetic inheritance. However, in humans, the analogous experiment gives the opposite result. When children were taken from the New Guinea Highlands and brought up in America, they grew up as Americans rather than New Guinea Highlanders. So, humans have abandoned genetic evolution of these aspects of behaviour in favour of cultural evolution which allows adaptation to occur much more rapidly. For cultural evolution to be able to control between-group differences of behaviour there appears to be a need for prescriptive systems that operate over enough people and over enough time in generations that natural selection can act on them. Such prescriptive systems have in the past generally been expressed in religious form. My view is that the essential role of religion lies in its behavioural prescriptions – the “*Virtue*” of Samuel Johnson’s definition of religion as “*Virtue, as founded upon reverence of God and expectation of future rewards and punishments*”.

There have certainly have been gods who haven’t existed – nobody now really believes that Apollo’s horses really pulled the sun across the sky – but it doesn’t make his teaching “*Nothing in excess*” – any less valuable. There certainly have been gods who have existed – oriental and Roman emperors; and in the twentieth century the category of god I call the “Demagods”, who are human leaders whose prescription is enforced by direct coercion rather than by future rewards or punishments. Of these Hitler, Pol Pot and Stalin are all good examples. They also provide an object lesson to the “neo-atheists” that persuading people to reject conventional religion may not persuade them of the merits of moral philosophy and that they can turn to something a great deal worse.

So I regard the hatreds and the brutality that religions and competition between religions have given rise to as the unwanted side effects of a medicine which mankind has needed – and in some form still needs – rather than as a primary poison. Now that the

scientific revolution has changed our perceptions of the world and particularly now that population expansion has turned mankind from an endangered species, into an endangering species, the moral paradigm which current religions prescriptions have established does need some change; and this will not be easy to achieve.

Denis Alexander: Thank you very much Peter. So we've got here a functional view of religion. It doesn't really matter if it's true or not – what is more important is that it should carry out a social function in society. Before heading back to Keith, does anyone want to come in on that view? That view is suggesting that we are asking the *wrong* questions – it's not a question of whether the new atheists are right or wrong but of whether religion is carrying our useful functions in society. Does anyone want to come in on that theme?

Andrew Brown: Two points about this. I am sort of generally sympathetic. Because I run this website I go to an awful lot of committed new or slightly used atheists writing in, and one of their fundamental passions seems to be a revolt against any idea of social compulsion and religion becomes a synecdoche for that kind of rule; you see it particularly when it comes to sexual behaviour: "I don't mind people believing what they like but I can't stand the thought that they are telling me who I should have sex with" and I always want to write back to these people and ask "Which Christians in particular have frustrated you sexually and under what circumstances, and was it really a theological argument?" So might it not be that the current wave of atheism has quite a lot to do with individualism and a rebellion against all forms of authority, rather than a theological component?

Peter Lachmann: No, I think what you are describing is the rise of a strong form of libertarianism which we have seen in recent years. Such libertarianism does pose a problem for public health and not just in regard to sexual behaviour. While libertarians don't rebel about not contaminating the water supply or soiling the streets, sexual mores are certainly contentious, as are vaccinations and fluoridation of water supplies. On an evolutionary timescale libertarians who reject public health measures may die out because those who accept them leave more progeny.

To respond to Tom's point, Dawkins has a problem in accepting that religion has an adaptive function of the sort I have described because it involves group selection. He believes that genetic selection works at the level of the gene for example to explain altruism, and extends this belief to his postulated cultural equivalent – the meme. Since cultural evolution works predominantly through language and communication between people the idea that it works at meme level, and not population level, is difficult to formulate let alone to believe.

Tina Beattie: If I can combine both your interventions. I am perfectly happy to accept that religion has a function in society and I am also perfectly happy to accept that in choosing to follow a certain religious narrative I am conforming to the function society wishes me to have,

just as I'm perfectly willing to accept that in being married and relatively willing to stick with it I am conforming to a certain functionalist aspect of what society expects me to do in my sex life too. *But* when the god I worship and the man I have sex with no longer mean more to me than those set of functions –then the social functionality cannot sustain the practices, for the element of desire has vanished. I think the reductiveness of this is not something I can handle. I do not have a religious *faith* because I am some naïve cog in a machine that conforms to a functionalist explanation of what people do. I am well aware of those explanations and I am not bothered with them as far as they go. But in the end if the desire and the mystery of why we choose the functions we choose rather than others is taken away, I don't think we should be bothering to discuss religion at all.

Tim Jenkins: Again, I am very interested in taking it from a social point of view. I was just struck with your invoking the Royal Society's motto because in a sense don't believe what you're told clearly can't work for humans who are after all collective, as you say. If you don't believe what you're told you're not human, so what that actually means is that there are very small areas where it's important to pay attention to evidence, isn't it, because otherwise it comes out as the sort of slogan of the sort of people that you are against.

Peter Lachmann: It's aspirational – it means don't believe anything *just* because somebody told you it was so.

Bob White: It's actually incredibly hard to translate.

Peter Lachmann: It's dog Latin. Andrew Huxley gave me this as a rough translation. It means you need evidence to support belief. Probably no-one is consistently at either extreme end of the spectrum between faith and scepticism. There are things that even sceptics need to take provisionally on trust, until evidence becomes available.

Tim Jenkins: I was interested you started with saying that you do things because they're impossible and you need evidence. It's quite clear that both of them are collective and one of them concentrates on motivation and the other concentrates on those fairly rare questions where you do virtually need, as it were, a forensic question, you need to know why it is that you believe certain things. It seems to me that does take it a long way away from the simplistic solution that you are so rightly condemning.

Denis Alexander: Can we let Keith come in at this point?

Keith Ward: I could accept a genetic account of how people have come to believe things but that doesn't answer the question "Should I believe them?" And if you tell me it's because science engenders rules which I ought to obey, I can still reject them.

Peter Lachmann: No, you wouldn't – because you're a respectable member of society.

Keith Ward: In some ways – well let's not go into that! If you suggested to me as a formulated reason for my behaviour that it was conformity with some particular group, I think you might find difficulty in saying which group it was exactly.

Andrew Brown: But Keith this is how all parents in society bring up our children. They do things because it's conformity first with their parents' wishes and then with their peer group and so on and so forth. Much, much later by the time, and only after we've got a deep emotional conviction that we know where we stand with the group and it is tolerable, that we're not pathetic outcasts. Maybe ought to make an exception for Isaac Newton here, but you see what I mean.

Keith Ward: I was brought up *not* as a religious believer and so for me my codes of conduct were certainly, if I may put it this way, English – I spoke English and I had certain values and ideas but they had nothing whatsoever to do with religion, I assure you. So then the question, for people like me – and there are lots of us around these days – is why should religion ever come into this at all, we can live without religion and that would be my problem. You would say here's a function and I would say well, here's a function that seems to have been lost and we don't need it any more.

Peter Lachmann: Many people conform to the prescription of the religious society in which they live even if they don't believe. I am deeply sceptical, but I am entirely happy to conform with many of the precepts of both Judaism and Christianity, for example, to treat your neighbour as you would yourself. This is an entirely logically consistent point of view. I would much prefer to discuss the whole topic of why there are religions without reference to any currently existing religion, none of which is more than around five thousand years.

Tina Beattie: You know we can't discuss these things without reference to existing people

Peter Lachmann: I think we can do so.

Tina Beattie: This is my criticism. This is about men lining up on abstract sides of an abstract fence.

Peter Lachmann: Religion is probably seventy thousand years old and functioned long before any of these existing religions. There's no reason to believe they didn't work because they left successful outcomes.

Tim Jenkins: So what's your evidence?

Peter Lachmann: There is archaeological evidence in the Tsodilo Hills in the Kalahari Desert of a serpent "carved" on a rock, which is believed to be a devotional object. Burials of bodies with grave goods and aligned in particular directions are also very old.

Tina Beattie: How do you know that's what you are calling religion?

Peter Lachmann: Such artefacts are regarded by archaeologists as representing the early stages of religions evolution.

Tina Beattie: They invent the terms to describe what they found.

Peter Lachmann: Ritual seems to have started to happen about seventy thousand years ago. Science is only four or five thousand years old, so religion is much older than science.

Tom Blundell: I think the most convincing evidence is from an anthropological point of view. But let me take a different line on your talk tonight. I thought that you escaped into physics, into multiple dimensions of space that are not really understood, and that you put God somewhere out there beyond present day knowledge and science.

In some ways I felt relaxed about that because it's nothing much to do with what we do in this world. But then I asked the question as to how people are touched by God, how people get conversions, how some people are re-born and so on. We've heard the question this evening about the power of prayer. In many ways I think you are unfair on Dawkins. I have read articles where you say that he hasn't read the right things but I think it's a perfectly fair approach to ask what is religion in practice. The fact is that most people believe, whether they are Muslims or Christians, in some sort of God up there; most believe in the power of prayer. Most believe in manifestations of God here in our four-dimensional world. Scientists can in principle comment on the power of prayer, but you were negative about the idea that anybody should do any experiments on it. I would have thought you would welcome that because you would want to find the truth. The many manifestations of religion in *practice* are what many of us are concerned about. Of course we can say that religion is really nothing to do with any of that, that people are misguided, these books are out of date, but it is how religion is practised that concerns people like Dawkins and Sam Harris and a lot of the others – and myself as well.

Keith Ward: Well, I've practised religion for about forty years now and I have found it totally life-enhancing, so when you say what is important is how it is practised I don't disagree with that, but I don't see what you object to in that.

Tom Blundell: I object to ways that religion affects all of us, the way religion is practised, where people believe the Bible or the Koran. Not just as fundamentalists, by the way. I think it's unfair to criticise Dawkins because he's commenting on the way that religion is practised.

Keith Ward: I would like to make a remark about Dawkins. I admire his concerns as a zoologist, who knows a lot and has been quite influential in saying some controversial things about the evolution of biology. I have admiration for that and I don't pretend that I could have a reasonable debate with him on that ground. I dislike the fact that he says, when speaking to me, in my role as Regius Professor of Divinity in Oxford, that there is no such subject as Divinity in Oxford. I just take that a bit personally, you know, and think what have I supposed to have been doing all this time! So it's not so much that I'm being rude to him as that he is being extremely rude to me.

The point is I have got no criticisms of Dawkins as a scientist. Other people may have, it's not my job to do that, I'm not competent.

Tom Blundell: We can have a conversation about that.

Keith Ward: Well, I wouldn't want to have a conversation about that. But when he comes into my subject as an academic subject – and I'm not speaking as a religious person now – and says "I have never read a book on Theology because there's nothing worth reading", then that's not an academically respectable comment to make. It just has to be said that I couldn't say to a biologist "I'm not going to read any books about Biology, it's really not worth it, there's nothing worth reading about". I wouldn't dream of saying that. He says it to me about Theology, so that's the background of that piece you found on the web, which I did not know was there. We get on very well personally, there's no personal animosity but in public when I do debates with him it seems to be a different matter.

Tom Blundell: What about your response to the person in the lecture who claimed to be a Christian? Your response was, I can't remember your words exactly, that you wouldn't support research into the power of prayer.

Keith Ward: No, I wouldn't.

Tom Blundell: Is that because you don't have confidence in it?

Keith Ward: No, it's because I regard requests made to God, whom believers in God think is the personal mind which created the universe, as subject to experimentation and I think that is immoral to carry out experiments of that sort.

Tom Blundell: It's immoral if the effects of prayer will affect our lives?

Tina Beattie: I find your response to that a bit unsatisfactory because we're on a ticket to nowhere when we protect the sensibilities of God. I think we need to be thinking about humans and I find myself with two completely different responses to that question.

One is that the empirical evidence which you seek when you do experiments of that nature is not there to be gained, so any human subject who would say "I will be your guinea pig about prayer" has fundamentally misunderstood what prayer is about just as, to give a different example, anyone who says to Kinsey "I will come and be your human guinea pig about sex" has fundamentally misunderstood the nature of what they are doing. The nature of what it means to be human in this activity is an inscrutability and a privacy and when you say what I am doing is open to your scientific experiments you have immediately abrogated the very humanness of what you are doing. That's one side.

The other side is if God is in any sense meaningfully present to the human it can only be in material ways and Thomas Aquinas would have agreed with that. So come on in there, guys. Put your electrodes on my brain when I pray and you will find I have an altered state of consciousness. What have you discovered? Nothing, absolutely nothing, about the nature of God. When we invoke a moral kind of "Oh no, we don't go there" – why not? God is big enough, we can go where we like. Read Shusaku Endo's great novel "*Silence*" where the priest, the Jesuit in 17th century Japan, tramples on the image of Christ and realises that he is doing nothing that can damage Christ. So you can do your experiments on us when we

pray, but only if you understand what you will be discovering. You will learn nothing of God but you will learn something of the human that may be very valuable and we shouldn't be afraid to go there.

Denis Alexander: Can I chip in here? From a scientific point of view, I have always thought, quite apart from what Keith has mentioned already, that the whole concept of scientifically investigating prayer is subverted by proper control groups. There will always be some nuns, out in Delhi or somewhere, praying every day for people recovering from surgery so trying to test whether prayers are answered using quasi-scientific methods does not seem to be feasible.

Tom Blundell: I don't deny it would be difficult. I am just intrigued by your reactions.

Peter Lachmann: There have been two experiments on this. One, which is well known to all of you, is the Royal Family is prayed for in every church every week and has been for generations. Their mortality statistics are, however, unimpressive.

Bob White: The Queen's doing all right!

Peter Lachmann: I am talking about overall mortality over many generations. George II was the first monarch to reach the age of 70.

You may be aware of the, literally, fantastic study done by Leibovici in Israel and published in the British Medical Journal. They carried out a trial of "retrospective" prayer on people who had already left hospital to see whether the prayed-for group had a shorter stay in hospital, and found some effect. This was quite clearly a hoax. However the responses that were put onto the online BMJ make one realise that the degree of irrationality that attaches to experimentation on prayers goes to levels which I would not have anticipated in a reasonably educated Western society.

Denis Alexander: We are on the topic of whether we can find any supporting evidence for God's reported actions in the world. Does someone else want to come in, someone who hasn't said anything yet?

Derek Burke: Well, I think this is a very mechanical position to hold. It's a position in which you can do certain things and God will respond in a particular way, it's a prayer wheel approach and Christians have a real problem with this.

We lost a daughter with breast cancer and we prayed for her and she died. So I just have to say that wasn't God's will and live with it. All of us have had that experiences like that, I have to remember the man in the New Testament who said "Lord I believe, help thou my unbelief" so I am in a different style to you, Peter, of a puzzled supplicant who is troubled but doing all he or she can. It's not a mechanical operation. You say to Christians "Why do you still believe if it doesn't work?" and I think the answer is there is nowhere else to go, so you just hold on.

Denis Alexander: Any comments from anyone else on that particular issue? When I work as a biologist we work by inference to the best explanation and so applying that approach to the broader metaphysical questions, we'd like to ask: why does a universe or a multiverse bother to exist? Why is there something rather than nothing? Those are the fundamental religious questions it seems to me. And one way of approaching those kinds of questions is to invoke the existence of God as the best explanation that we have to explain the existence of what we see and experience as scientists, the intelligibility, the underlying order of the universe, the fact that it can be described in elegant mathematical terms and so forth. Personally I think that's a more fruitful approach than trying to subject religious claims to empirical testing, which is quite problematic. Each discipline makes claims that need to be justified using the criteria relevant to that discipline, be it history, philosophy, religion or whatever. A lot of the time science is simply irrelevant to assessing truth claims in these other disciplines, which have to be assessed using different sets of approaches.

Tom Blundell: Order can come out of natural selection; it's not necessarily a predetermined order. I have just spent the last two days at a meeting on evolution at the Sanger Genome Campus. One of the interesting observations is that if you take the gene products, which are the proteins, and ask the question about the number of architectures out of all possible that proteins might adopt, then life is very selective. About ten per cent of possible protein architectures are used by biological organisms as we understand them from multiple gene sequencing. But it is very difficult for me to see how any kind of intervention from a God could come in these evolutionary processes, for which there are perfectly understandable mechanisms. God's only intervention could be random mutagenesis. The order comes of selective advantage. Maybe I misunderstood about the designing of natural selection but you don't need any God to get order.

Bob White: What about the physical constants of the universe to start with. You've only talked about biology.

Tom Blundell: The argument is true of even the simplest physical systems, but this is trivial...

Tina Beattie: God is not a scientific designer, God's a creator. The process of creativity is not the process of design, it's fraught with the possibility of failure and it's always open to the freedom of what you didn't expect to come of it. Why can't we talk about God in those terms rather than this scientist or architect who designs something and executes it? The designer God is such a boring God; who would want it.

Andrew Brown: I've got a question for Keith about prayer – and indeed for Tina to some extent – in saying we shouldn't experiment on God, we shouldn't test God. Yet I take it that both of you believe that there is in some sense development in prayer, you belong to organised churches which from time to time replace their liturgies, improve them. On what

grounds do you decide if you're not testing God that one kind of prayer is better than another, for whom does it work better?

Tina Beattie: It's like choreography, you learn to listen to the music differently if you pay attention to it. You don't rewrite the score, you don't rewrite Mozart, but there are infinite ways of training.

Keith Ward: I know for you it's an important question about how you want some observable evidence.

Tom Blundell: No, I just mention standards between good and bad prayer.

Keith Ward: Well for me prayer is not like that, you see. For me asking for things is not ..

Tom Blundell: I don't mind what you do as long as religion remains outside what we can observe and test by experiment. I don't mind if you put it right outside in the way you've described it. What I get concerned about is when religious faith begins to make statements about the way that things operate. Evolution is not like Mozart. Organisms can evolve in the test tube. I have worked on HIV virus, I can see mutations occurring randomly, I can watch, I can sequence it, I can understand the system. It does not need a genius like Mozart.

Tina Beattie: You need instruments to play Mozart. You can't play Mozart without materiality.

Tom Blundell: No, of course not; that's not the point.

Peter Lachmann: I want to come back to the point about the anthropic principle – or the anthropic fallacy – where the question of why the physical constants of the universe are “just right”. I have a problem with this argument because it applies probability that is used for future events to events that have already happened. I will give two examples of this.

One is if you consider a man who goes into the Battle of the Somme and estimate, *a priori*, the likelihood of his surviving to write about it afterwards. This likelihood would be so low that you would conclude he was under divine protection. In reality, if he hadn't survived he would not have written the book and we wouldn't be asking the question.

As a scientist I give you another example. We know that it is impossible to predict which of a population of radioactive atoms will decay within any number of half-lives. This is a purely statistical event. To the best of my knowledge nobody has suggested that the atom which is going to decay after twenty half lives, as opposed to one, is the result of intelligent design – but it is *exactly* the same question.

Bob White: Can I come back on that? I wasn't using it as an argument for God's existence; what I was saying is that it's entirely consistent with a theistic argument – it's not inconsistent.

Rodney Holder: I don't think that's correct because you could argue that basically any universe is equally probable which is essentially what you're arguing. The fact is that this universe, which is substantiated, has significance, has meaning. It has produced intelligent

creatures able to speculate on it all, it is not just any old universe which is why this question why, why this particular universe out of all the infinitely many possibilities came into existence, is a question which can certainly be seen as pointing beyond itself towards a designer.

Ages ago John Lesley produced an analogy of a philosopher with the firing squad and said well, you have got sharpshooters lined up against you and they fire and all that and lo and behold you survive. Should you just shrug your shoulders and say “Oh well, there’s nothing to explain because I wouldn’t be here if they hadn’t missed. Or would you say “Well there’s some purpose in this, maybe they deliberately aimed to miss”, or something like that. You would look for a more satisfying explanation of it. And it seems to me, and I think that Peter probably agrees, that if there is the kind of God that keeps us talking about him tonight, if this transcendent ultimate reality who has purposes and intentions wants to bring about those and values, then that provides a very satisfying explanation for why a universe of this kind would exist.

Peter Lachmann: What about the radioactive atom that decays after ten half lives?

Rodney Holder: It doesn’t matter whether it decays.

Peter Lachmann: It may matter to the atom!

Rodney Holder: It’s not significant in the nature of the universe!

Peter Lachmann: Why not?

Tim Jenkins: One way of tackling and Keith did talk about the nomological and axiological explanation. The thing that struck me while that was being discussed is the business about when nomological explanations emerge and what, as it were, was the model that stimulates them, whether in fact .. solution? about initial states and general laws isn’t actually some sort of political model that’s evolved and applied more generously. It’s been enormously productive of course. Again it will have a genealogy and a specific set of issues that are to be raised and I think in some ways that’s a way of slightly sort of shifting the ground that we are battling over here.

Keith Ward: I don’t mind, that (the difference between nomological and axiological explanation) was the most important thing I thought I had said. But then people who say things are never right about what’s important. But for me a crucial question is: is there a proper explanation that is *not* scientific? That’s the point, so you have to then have an idea of what a scientific explanation is and whether it covers explanation in terms of human motivations and desires and choices.

Tom Blundell: I accept that

Keith Ward: So I just argued that axiological explanations exist in *human* embodied lives and I am trying to suggest that this is a very natural thought (but it may be mistaken), that it’s a natural way to take the universe that you live in.

Tom Blundell: I don't think anybody has any problems about that. It's when you at one moment talked about seventeen-dimensional space and then somehow connect it with your consciousness that I had trouble.

Keith Ward: I didn't want to make the whole universe dependent on my consciousness, like John Wheeler, but did want to suggest that there might be an axiological explanation of the whole universe.

Tom Blundell: It was the bringing together of those two things.

Keith Ward: At that point can I suggest an analogy, no more, between the way in which, say, a physicist might talk about something beyond space and time that had a mathematical elegance, and suggest that's interestingly analogous to the way a theist might talk about something beyond space and time that had something like beauty or elegance too.

Tom Blundell: We spend hours discussing the value of beauty in selecting a hypothesis. By the way, I think there is a very strong difference between the model of science you described, in which scientists think of mathematical models and complexity, and the way that most experimental scientists would work: they first have to ask a question which is going to allow an experiment to answer it.

The role of the model is to describe a hypothesis that can be tested by experiment – so they can understand the problem. It is not helpful to construct hugely complex models which are untestable. One gets into trouble in the area you were talking about where there is no experiment – where you can hardly think of an experiment, as you said – to test the various models. What most of us are doing is trying to identify problems we can solve with experiments that are possible – the skill of being a scientist is being able to select the topic where you can ask a question and get an answer with the experimental tools you have which brings further understanding. And the models have to be no greater than that, they are really hypotheses in an elegant form.

Derek Burke: And you frame experiments whether data is inseparable, so I think biology is a bit different from your examples. Cosmology and the biological world are so desperately complex that we don't know where to start, so as Tom says you start with an idea and you go out and you try and think of a way of testing it. The genius is seeing that there's a totally different way to interpret the data. That happens a few times a generation I suppose and then the world certainly turns upside down, and you say "Yes, of course it's like that". And so it's a different sort of pilgrimage I think from the physical scientist and we don't have any maths so can't make a physical ...

Tom Blundell: No, no, we do. Someone like Moto Kimura, who developed the neutralist theory, or John Maynard Smith – an ex-aeronautic engineer I worked with in Sussex – their ideas about evolution are all expressed in highly mathematical terms. Material science and much of physics are studied very much as I described. The problems for me begin when in

areas like cosmology you begin to get models which are so complex, and so outside any possibility of designing experiments to test them. But we are not materialists in the sense that we think that all life is understandable in terms of, as you say, space and time.

I also object to your definition of supernatural. Science moves on and what is understood to be natural, natural philosophy, which is what we do, advances, and so it changes. I don't think you can define the supernatural by using the definition of what was understood to be natural some time ago. It's a little more complex than that.

Keith Ward: I don't deny it's a little more complex and I did try and say I am not trying to lay down a Procrustean bed for science. I did talk mostly about quantum physics because that's precisely where scientists get into areas where it becomes difficult to apply the paradigm of experimental and observational science.

Tom Blundell: And that's why we escape, we go and do something we can do.

Tim Jenkins: Would you be supportive of Keith's categories if you looked at the question about elephants, which you so well put. This question about where does the intelligence lie, when you were commenting as it were on the stupidity of some of the arguments that were put forward, there is actually a certain sort of moral dimension, isn't there, to these questions about "things done elegantly are done well" and in some sort of sense we clearly feel they are good and it's absolutely right. In some way we would try to explore just as one does in the social sciences, one looks at rare cases where .. intelligent and that seems to me more the sort of thing you are feeling for, rather than areas about physical sciences or whatever, and there's this question about intelligent work, elegant work ..

Tom Blundell: Talking about elegance and beauty – and my grandfather was an artist and musician – elegant solutions are often simply beautiful and correct. That's why we are attracted by beautiful and elegant hypotheses!

Tom Simpson: Can I come back to something you said at the start? It seems to me that some of the implications of what you said may be quite uncomfortable – or what I would take to be uncomfortable. Two points by way of set up – the first would be it seems to me moot whether a functional explanation counts against the truth of that which is supposed to be explained, but for the sake of argument I want to grant that and certainly a lot of people would perceive an undercutting explanation from tonight's discussion to be undercutting the truth a bit.

And the second premise, by way of set up, is that although you may accept the prescriptions of Judeo-Christianity for your own personal life and yet deny the truth claims of it, that does seem to me to be a degree of intellectual tension there. Many people free from the truth claims of Judeo-Christianity will see themselves free from the prescriptions to obedience. They would see no reason to obey that because the reason is given by its truth.

The other point by way of set up is that you do seem to want the group selective benefits of obedience to these prescriptions. So the argument is very simple. If you promulgate an undercutting explanation which leads people to think that it's true, then they will stop obeying it. So if you don't want people to stop obeying it by modus.. you should stop promulgating that undercutting explanation which would suggest that these arguments shouldn't be given.

Peter Lachmann: That's a good point. It's not however a point that an analytical scientist could agree with. We seek to explain, we do not seek to control. In contrast with the mediaeval church I do not accept that there is anything that is too dangerous to know – although I am sure there are many things that it is too dangerous to do. I am not a book burner and I would not recommend you to go down that path. I agree with you that the analysis can be uncomfortable.

I think we are in an extremely difficult position and have been now for some ten or twelve generations. We adhere to a moral paradigm that was suitable to an endangered species and we are no longer an endangered species, we are an *endangering* species. The moral paradigm therefore needs to be modified as it has been to some extent. The women's liberation movement is an excellent example. The idea that women should be free to do whatever they wish is certainly not new; but in past ages any society that allowed its women of childbearing age to be killed in war would not have left enough survivors.

The other attempts of shifting the paradigm in the twentieth century are deeply unpleasant, as I have already said. Both Soviet Communism and Nazism are ways of trying to shift the moral paradigm: "We are the master race and all the others are subject races and we will enforce this view on them". Therefore, one does need to be very careful; but the paradigm does need shifting and I don't think it is bad to acknowledge this need.

But can I make a comment specifically to Keith in response to what was just said. I don't agree totally with Tom Blundell on this point. (*We don't expect you to!*) Science, in my view, does adhere firmly to the idea that the laws of physics will eventually explain chemistry and the laws of chemistry will eventually explain biology. We anticipate that this is true and have had reason to do so since 1828 when Wohler disproved the "vitalist" theory by making urea (an organic molecule) by heating ammonium cyanate (an inorganic molecule). While most scientists are convinced that this continuity of explanation will one day be achieved, this is still a long way off. It just shows that science has a lot more to discover.

Something similar is the case with God(s). The God you are talking about is a God that not only created the universe but manages it. But that is only one model of God. There is also a God who made the universe and takes no further part in its management; and (perhaps the model I find most attractive) the God, originally postulated by Aristotle, who neither made the universe nor manages it but who was a purely contemplative God. In the

Greek view, pure contemplation is the highest form of activity. And just as it is probably not meaningful to us to ask what happened before the Big Bang, it is equally not meaningful to ask questions about the purely contemplative God because there's no way that we can know him.

Denis Alexander: Either Tom Simpson or Keith could come back on that, or we could move on to something slightly different.

Keith Ward: Well, I suppose the God I was talking about is rather a timeless, changeless God and much more so than the very busy, always-proving-himself God who wants everybody to know about him. So there's something in that, and it is perhaps worth saying that the God of Thomas Aquinas, and therefore of the traditional Catholic view, is the God of Aristotle basically and that is *par excellence* the changeless God.

Some of the problems I have about what you seem to mean by God is the view that God has to be demonstrably active in a way that you could observe and experiment upon. What I was trying to do was show that doesn't have to be involved in the idea of God. It's a bit like Steven J Gould's idea of "non-overlapping magisterial of science and belief in God", except I do think they overlap but it's very difficult indeed to see exactly where they do.

Tom Blundell: It seems to me that religion would have no advantage to the individual if there wasn't a chance of intervention. Surely that's why most religions actually have some interventionist aspect. You have got to believe that it's going to help.

Keith Ward: For me, prayer is primarily contemplation, and that might help, but not in a straightforward way.

Tom Blundell: Well, it's not just about prayer; it's about being good; it's about doing the right thing. They are common features to all religions. But there's plenty of evidence that there is selective advantage for our species to have inbuilt feelings of this sort, and what religion is doing is meeting some of our inner demands.

Keith Ward: But I think the evidence from some anthropologists is totally consistent with a view like mine that basically says it's very natural for human beings to have religious beliefs that form a support for moral beliefs.

Peter Lachmann: What does that mean?

Keith Ward: What, that it's very natural? It's a view that an infant tends to form and it carries on through adulthood.

Tom Blundell: I agree that it's very natural, and it's very natural to be good and there are advantages in the way that the human race has developed, and other species too. It doesn't mean to say it's right.

Peter Lachmann: What is regarded as natural in one community may not be so regarded in another. That's why religions compete. Although certain features are very widespread, the important thing about religious prescriptions is that they are *not* identical. That is why the

idea that one can merge all religions into a single religion would cause them to lose their function. That actually explains why religion has to be intolerant and also explains why it is often horrible and brutal.

Rodney Holder: I wanted to bring to people's attention to something Keith seems to say, at least in "The Big Questions", that the kind of universe we live in is an open and flexible one and quantum theory shows us all that. At least there is room for God to be acting in that kind of universe and I think you do believe that we as conscious beings, consciousness does things. This view of the primacy of consciousness in your whole approach seems to say well we actually do this, consciousness acts, and indeed the God that we believe in also acts in the universe, not contrary to the laws of nature – and maybe that's how it then becomes difficult to detect this kind of action.

Now you don't talk much in the book because it's very much a book about the religions I think – well, you do say something about the particularities which is just in general terms about religions but the Christian religion, an Anglican priest and so on, does say that the God we believe in has become incarnate and has lived a human life, and did things on the earth, acted in that kind of way and then died on the cross and was raised from the dead and so on. There are these particularities and that looks perhaps more like empirical evidence; at least we've got documentary evidence about it, and more tangible than those things we have talked about. I wonder if anyone wants to comment on that.

Keith Ward: What I was trying to suggest, although I agree I think it's an intellectual problem, is that there can be factual, unrepeatable, once-for-all statements which are not scientifically investigatable precisely because a historical thing happens once and it doesn't happen again. Take the resurrection. How would you possibly approach that as a scientist? You say this is a unique event, it's never going to happen again, it only happened once, it happened for a very special reason, you can't do anything about that, you just say OK, what am I supposed to do, is it within my frame of reference? And the answer is not really, because your frame of reference is what normally happens

Bob White: You could look for documentary evidence to prove whether it really did happen.

Keith Ward: You can encapsulate what I've been saying, in my mind anyway, as the difference between historical explanation and scientific explanation. Now evolution is a very interesting case.

Certainly evolution is a scientific theory and was fully established as such in 1953, but at one time it was a primarily historical explanation and I think there's a big difference between a historical explanation, you know, why did Napoleon lose the Battle of Waterloo. You know that there are going to be different opinions about this that are never going to be settled but it doesn't stop you doing history, whereas in science you want something a bit more decidable, really, because you state general laws and you can carry out experiments

which show that they work. Perhaps you could sum up what I have said as that there is not only a difference between axiological and scientific explanation, but also between historical and scientific explanation.

Tom Blundell: I agree with some of what you are saying. I chaired a Royal Commission on the environment for seven years and I have also been involved in politics. The issues there are quite difficult for a scientist because our skill is in choosing a scientific topic that we can solve and which will have an impact, and that's what I have learnt how to do. But if one is involved in policy issues then of course one has to make statements, because one needs an answer. As a politician you can't stop and say "Oh, just hold on for a year or two whilst I collect some more data". This is an area we as scientists find particularly difficult.

Keith Ward: I think that's the interesting cultural crisis or difficulty that we're in. This CP Snow "Two Cultures" divide is becoming worse because people are reading the Bible literally as though it was science and then scientists are thinking what a strange scientific document this is. I know that people in history and philosophy and music and art are being told by people like E.O. Wilson, the great sociobiologist, that their subject will be explained totally by the way wavelengths of sound and light impinge on the human brain. That's what Wilson says and that's a major problem. I think we need to find some way to overcome the divide between science and the humanities in a more satisfactory way. Religion is sort of in the middle of that, somewhere between music and physics, and perhaps our debate should be broadened out to encompass more than just narrowly science and religion.

Denis Alexander: We have worked Keith very hard and thanks to everybody around the table for their contributions. We have batted around lots of interesting ideas and I think the sciences and the humanities have been having some good exchanges tonight as well, with the theology in the middle there somewhere as you say, Keith. So thank you Keith very much indeed for all your contributions.

Who's Who

Revd Prof Keith Ward is a Fellow of British Academy and on the Council of the Royal Institute of Philosophy. He was formerly Professor of the Philosophy of Religion at King's College, London, and Regius Professor of Divinity at Oxford. He is the author of 'The Big Questions in Science and Religion' and 'Why There Almost Certainly is a God' amongst other things.

Dr Denis Alexander is Director of the Faraday Institute and Fellow of St. Edmund's College, engaged in cancer and immunology research at the Babraham Institute; editor of the journal *Science & Christian Belief*; author of *Rebuilding the Matrix* (2001, Lion), *Creation or Evolution*

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Prof Tina Beattie is Professor of Catholic Studies, Roehampton University and Senior Fellow in Crucible, Roehampton's Centre for Education in Human Rights, Social Justice and Citizenship. Author of *The New Atheists: The Twilight of Reason and the War on Religion* (DLT 2007), and *New Catholic Feminism: Theology and Theory* (Routledge 2006).

Prof Sir Tom Blundell FRS leads the department of Biochemistry, University of Cambridge. His department is interested in determining the three-dimensional structures of proteins involved in receptor activation and intracellular transduction of signals. The research involves the expression, characterisation, crystallisation, X-ray analysis and NMR structure determination of individual components and multi-protein complexes.

Andrew Brown, Editor, *Belief, Comment is Free*, the Guardian, columnist, the Church Times; author, *The Darwin Wars*, *In the Beginning was the Worm*.

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Prof Derek Burke, Honorary Fellow of St Edmund's, a former Vice-Chancellor of the University of East Anglia, a former Chairman of the Advisory Committee on Novel Foods and Processes, a former Specialist Adviser to the House of Commons Science and Technology Committee and a member of the Bioscience for Society Panel of the BBSRC.

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James R Crocker studied theology at the University of St Andrews. He is currently working as a research assistant on the Faraday Institute science-faith resources for churches project. He has just applied for a masters degree at Oxford in theology, and hopes to move on from this to a doctorate looking at the theology of Helmut Thielicke.

Revd Dr Rodney Holder, Course Director of the Faraday Institute, former Priest in Charge of the Parish of the Claydons, Diocese of Oxford; author of *God, the Multiverse, and Everything: Modern Cosmology and the Argument from Design* (Ashgate, 2004) and *Nothing But Atoms and Molecules?* (republished 2008).

Timothy Jenkins, Assistant Director of Research in the Faculty of Theology & Religious Studies, University of Cambridge and Dean & Fellow of Jesus College; author of *Religion in English Everyday Life* (Berghahn, 1999), *An Experiment in Providence* (SPCK, 2006), and *From Le Play to Bourdieu: the Life of Property in Béarn* (Berghahn, forthcoming).

Prof Sir Peter Lachmann FRS FMedSci, Emeritus Professor of Immunology and Fellow of Christ's College, University of Cambridge. Complement and immunopathology. Author also of papers on bioethics and *Why Religions? An Evolutionary View of the Behaviour of Bees and Men* (The Cambridge Review, 1983).

Valtteri Mujunen studied theology and history at the University of St Andrews. He was then awarded a bursary to study French for a year at the Institut Catholique de Paris by the Institut Catholique d'Ecosse. He is about to complete a masters degree in business at St Andrews, and plans to move to China for a year to study Chinese upon completing his national service in Finland next year.

Tom Simpson, PhD student in Philosophy at Corpus Christi College; studying epistemology, testimony and trust; former Royal Marine (Northern Ireland, Iraq, Afghanistan).

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