

The God of our ignorance

What is religion about?

Words have an interesting habit of changing their meanings, particularly when they are removed from one context and put in another. 'Jezebel', for example. This is a word generally applied to a woman using her arts of seduction to attract men from their wives, whereas Jezebel in the bible, the wife of king Ahab, was described as a bad lot because she introduced a new religion, the worship of Baal, a fertility god. In my reading of the situation, she did this not out of perversity, but to reinforce her husband's position: it was an act of faithfulness, not the reverse. The Israelites, perhaps rather late in time, were making a transition from a nation of nomadic tribes to a settled nation, with a ruler. Nomads are hard to control: you cannot rule over them. The rule of a king requires bureaucrats and an army and it is not possible to afford these overheads in a subsistence economy. Kingship requires agriculture, and agriculture requires fertility. As Jezebel saw it, this religion, the worship of Baal was necessary to her husband's position of power.

In many ways, religion then occupied the place science now occupies. To grow crops, you ploughed and invoked the fertility gods, like Baal. Nowadays, you plough and spread fertiliser and do all the other things science prescribes for growing crops. To Jezebel, going back to the God of Israel was reverting to a primitive past, like using horse drawn ploughs today. In those days, and throughout most of history, religion affected much more than agriculture: its scope was unbounded and applied to almost every aspect of life. If you went to sea, you invoked the god of the sea; if you were ill you propitiated the gods; and if you went to war you counted up the monks praying for you quite as much as the cavalry and foot soldiers. Religion is still important in almost every aspect of life, but the way in which it is important has changed. To what extent has science taken over from religion and to what extent should it still be important to us? Are science and religion trying to do the same things? If not, what is the difference? And why are there so many different religions? In this essay, I am trying to reflect upon the nature of religion but thinking particularly from the point of view of science. Are science and religion totally separate so there can be no conflict between them, or are there things in common? Does science apply to religion? Does religion apply to science?

To start to answer these questions we need some definitions. Science is easy: it is an activity characterised by the scientific method which consists of the advancement of a theory about an aspect of the real world, the derivation of predictions from it, and the testing of the predictions against reality in observations or experiments. Of course, science, as a human activity, is surrounded by other characteristics such as the motivations of the scientists, respect for authority and the particular techniques and customs taught by schools of science, but the essence of it is to do with ways of thinking about reality in a fashion which can be tested by experiment or observation. Science tells us about the world around us and, in my view as a scientist, a scientific theory verified by experiment is as close to reality as we are ever likely to get.

Religion on the other hand is not so well defined and there is less agreement on what it is all about. Some would hold that it is a theory of everything, so science, in some sense must be subservient to it: others that it is simply a human activity, like dancing or singing, activities which have little to do with reality and are completely independent of science. Dictionaries are not entirely helpful: they give a range of

definitions from a cryptic “Belief in a supernatural being”, (probably written by a western atheist as it excludes Buddhism) to several paragraphs in the Shorter Oxford. Out of these, it is possible to draw three ideas, namely a way of life, belief and discipline. By discipline I mean the outward things like going to church, wearing funny clothes, singing hymns and all the other things religious people do and can be seen to do. Belief, on the other hand, is what they say when they talk about God, or Nirvana, or loss of self or any of these other confusing words. And the way of life is what they actually do when they are motivated by religion. Beliefs are there to justify the way of life: the discipline is there to help you follow it.

I hope that most people will be able to accept these tentative ideas. The essence of them is that the main point of religion is how it is expressed in the way of life: the discipline is secondary. When I first wrote this, I took it as self-evident, but subsequent events have shown that discipline, and in particular, the wearing of certain clothes and other things which affect appearance are very important to people. If you doubt this, try and separate a Sikh from his turban or a Moslem woman from her veil. But I would say the importance here is mainly one of identity – giving up one of these symbols is like asking a man to wear a skirt. The outward signs of religion are often identified with the religion, so asking someone to give up the sign is like asking them to deny the religion. The practise of a religion and how it is demonstrated outwardly are important aspects, but I would say that beliefs, and how they are expressed in life, are more important.

With this basis, I shall argue that science and religion have this in common, that scientific theories and religious beliefs are both about reality, that is, they are saying something about the real world. This raises a philosophical point. It is important to realise that all our knowledge of the real world comes through our senses. Now while no one seriously questions the real existence of a chair which we can both feel and see, when it comes to more complicated things like God and religion there is a question as to whether they correspond to reality or not. Take a football game. When you see one, there is no doubt that 22 people are engaged in kicking a ball about. But the game itself is a human invention, a social construct. It does not have any meaning apart from that and does not express any aspect of reality apart from young men’s natural exuberance – it doesn’t have any deeper meaning. Now, when it comes to religion, and moral issues in particular, we have to decide whether things are morally right or wrong because they are generally accepted as being right or wrong, or whether they are right or wrong because this reflects some aspect of the real world. If the former you cannot really say that religious beliefs are either right or wrong: they simply reflect social conventions. If the latter, then a religious belief can be wrong in the same way that a scientific theory can be wrong when experiment shows that it does not agree with reality. I would say that no one who follows a religious belief thinks they do not have some basis in reality. Religious beliefs are not fairy stories. But the reality they deal with is within ourselves. Because they are meant to be expressed in daily living, they are much more subjective than scientific theories. And this fact, that they deal with our inner motivations, means that they are particularly difficult to reason about: so much so, that I would say they deal with some aspects of reality which will always be beyond the reach of science and this is where the real distinction lies.

Religion then, is what you do when you cannot justify your actions by thinking or common sense. Religious people do not pray for the sun to rise tomorrow or the seasons to come in time: Sir Isaac Newton takes care of that. If a farmer wants to

know what crops to grow he analyses the soil and looks at the market. If you want to know what car to buy, you read the reviews and go for a test drive. In most day by day decisions, it is not necessary to pray, but rather to think. But there are many situations, and these are often the most important situations in life, where thought will not help. Choosing a school for your child for example. Measure the performance of the school by all means, but the values it has, the character of your children and your ambitions for them are more important factors. You meet the teachers not to see how good they are at instilling facts, but rather with whether their values agree with your hopes for your children. Other examples are choosing a career or a job and choosing a husband or wife. In fact, all the major decisions of life seem to have these elements where science can be of no assistance. In all these cases, the difficulty resides in appreciating the values to apply, how they operate in the situation and in uncertainty: except in extremely limited circumstances, science cannot predict the future and it is frequently necessary to act even in the darkness of this ignorance. So the question is, at what point do you give up on science (or reason) and act in faith (or in the light of religion).

My starting point then is the supposition that because science is value free and frequently cannot predict the future, we need religion to give us values and we need religion to give us direction in the face of the unknown. In fact, I will be putting it the other way round. The values we *all* live by and the goals we *all* pursue constitute the religions we follow and we need a way to think about these different religions.

Now I think this definition is broad enough to encompass atheists and humanists, a statement which usually encounters opposition both from religious people, as well as atheists. But looking at it from the outside, atheism seems to be a religion. It has its priesthood: those who propagate it. If you are an atheist, surely the correct response to other people's belief is to shrug your shoulders and say, more fool they. But activists like Richard Dawkins and A C Grayling spend time and effort propagating their beliefs. Dawkins biography is called *Devil's Chaplain* and his writing, particularly the purple bits, is full of religious metaphor. The problem with atheism is that its values are not gathered together in a coherent form, its beliefs are not articulated and its discipline is almost non-existent. Where for example is the atheist treatment of eugenics, or euthanasia, or embryo manipulation and in what terms are these things either justified or opposed?

I would also like to say to the atheists that dialogue is much more effective than polemic. There is a lovely passage in E O Wilson's *On Human Nature* somewhat regretting the ineffectiveness of current efforts to persuade.

Today, scientists and other scholars, organized into learned groups such as the American Humanist Society and Institute on Religion in an Age of Science, support little magazines distributed by subscription and organize campaigns to discredit Christian fundamentalism, astrology and Immanuel Velikovsky. Their crisply logical salvos, endorsed by whole arrogances of Nobel Laureates, pass like steel jacketed bullets through fog.

If atheists want to convince believers, they need to do better than demolish straw men and that needs dialogue and some common ground. In order to persuade people you must be able to put your ideas and theirs side by side to compare in equal terms, and I am calling what you compare 'religions'. And the essential content of these religions is concerned with the values and goals people live by. Including atheism in a comparison of religions will, I hope, give an insight into what religions are all about.

So my argument, and the justification for the title of this essay, is that we use religion to answer unanswerable questions, that is, those outside the scope of science. So we need to show both that science has some limitation in the areas where religion operates and that these areas are meaningful, that is, have some connection with reality. And we start by justifying the limitations of science and reason by looking at values.

The values people live by

What are values and where do they come from? This must have been an issue from the beginning of time. The moment conscious human beings appeared on earth, they must have wondered what life was all about and how they should live. Trying to analyse how people have thought about this through time is hard. For a start, and particularly for pre-historic times, one can only speculate about what was going on in people's minds and what it was like to actually *live* according to some of the philosophies of life which people have followed. It is also the case that people do not follow one philosophy consistently all the time. Their actions are drawn from a number of motivating forces which people themselves recognise as sometimes good and sometimes bad. It is a human characteristic that we fail to follow the ideals we would like to follow. Real people are inconsistent.

But given these caveats, it is possible to see a number of ideas, or sets of values, which have been important in motivating people in the past and are probably as important in different ways today. I have selected seven different strands of thought to illustrate the different values people have, which I will briefly describe in turn.

The tribe As far as we can tell from fossil evidence and from analogy with current primates, early man lived in bands. Indeed, it seems hardly likely that man could live a solitary life in early times without falling prey to some predator or other. In this situation, when your life is totally dependent on others, the tribe becomes of over-riding importance. You are defined by your membership of the tribe. In many ways your individuality is lost in the larger whole. What is good is what is good for the tribe, because without it you cannot survive. Because of their grounding in biological necessity, it is unlikely that the forces which drive this tribal identity have been left behind today and they no doubt re-surface in nationalism or even football hooliganism. This sounds rather negative, but tribal forces can be either good or bad. Social pressures can simply reflect prejudices like witch hunting or the fear of strangers, but equally they act to curb anti-social behaviour. They are the glue that keeps society together. After all, there are plenty of things today for which we are totally dependent on the family, the community and the state and it is as well to acknowledge that fact and act accordingly.

The heroic ideal Flowing almost inevitably from tribal forces is the idea of conflict with other tribes and therefore the dependence on fighting men. For many centuries, the ideal life, at least for men of noble birth, was as a warrior. Aggressiveness, skill in combat and bravery in the face of death were all valued and the Spartan mother sent her son to war with the words, "Come back victorious, or on your shield." Honour was everything. Different values applied to those of lesser birth, but fighting is still valued, perhaps even when it should not be. We need heroic deeds today, but applying modern values, we are less happy with heroic deeds of aggression.

Propitiating the gods Anyone who has been lost in a forest, with the light fading, brambles catching at your clothing and the path disappearing can appreciate that the

world can look threatening. The earlier you go, the more this must have been felt, as less and less of the world was under the control of man. In such a threatening world, the powers at work are often personalised and you make your way in the world by keeping these imagined persons happy. Even today, the arbitrariness of the world seems to call for some action, even if it is only to pray your computer does not fail while you undertake some critical operation. Propitiation can be like a prayer: all those invocations of deities at pagan holy places did perhaps make those invoking them think more about their situation, in a similar way to prayer. But propitiation can become, and in old times was, a way of life. You live the good life by keeping on the right side of the gods.

The pursuit of happiness This sounds perfectly straightforward. You live the good life by doing that which makes you happy. Doesn't everyone do that? It is even enshrined in the American constitution: every one has the right to do that which makes them happy. But the practice seems to be more difficult than the theory and it all turns on the word happiness. If you try and define happiness, you are in effect trying to define the good life, so 'the good life is the pursuit of happiness' becomes a tautology. On the other hand, if you define happiness by its physical outcome in the body (feeling of well-being, etc) you include drug induced states in the good life, which most people would reject. This is one of the fundamental problems in the question of values. In religion, happiness may be a by-product, but it is not necessarily the main aim. Christianity, for example, is not there to make you happy. In many cases, quite the reverse. And the pursuit of happiness itself is no certain guide. Most of the good things in life can only be obtained at the cost of some pain. The question is, how much pain is worth enduring for how much good and there is no rational answer to that question, particularly when the good is uncertain.

The rational approach The ancient philosophers thought this problem ought to be susceptible to reasoning and living the good life has remained a central problem in philosophy ever since. It has been fruitful, but like all reasoning, the approach is dependent on the axioms selected, which in effect define values. For example, Aristotle thought that as reasoning was what distinguished man from the other animals, the life of reason was the good life. But then, being an intellectual, he would think that, wouldn't he? And the Nazis were perfectly logical in their reasoning, it was just that they started with racist axioms which most people would today reject. The rational approach to life is extremely important and useful, but it does not excuse you from exhibiting and questioning your fundamental assumptions.

The cynic It is easy to give up and say that we are undoubtedly animals: they do not have these problems, so let us behave like them and discard the artificial trappings of civilisation. This train of thought reappears throughout time, from the original cynic philosophers, through recurrent 'eat, drink and be merry' ideas, the hippy generation and the current preoccupation with sex. Most people would reject the idea that man is no more than an animal, but it remains an issue as to the extent to which we place the animal part of our nature in the good life as whole. People must eat, sleep and have sex: where do these drives fit in?

Eastern religions Most of the ideas above have figured in Western thought, but this by no means exhausts the subject. Eastern religions contain many of the above elements, but Buddhism in particular, takes a different approach, which I would characterise as practising a state of mind which in some sense transcends the vicissitudes of everyday life. Now it is hard to comment on this approach without

living it yourself, but clearly, if you believe in directing your life to satisfy goals, techniques to control the emotions which may distract from these goals would be valuable. However, denying that such goals exist at all means that ‘What is a good life?’ is a meaningless question. You either practise Buddhism to *be* good or you practise it to avoid the issue altogether.

The above descriptions are surely brutal over-simplifications, but it nevertheless seems to be the case that, after two or three thousand years of thought, there is no rational justification for the values we live by. People have lived by many different sets of values and there does not seem to be a reason to choose between them.

Does evolution provide an explanation for values?

The theory of evolution applies not just to the physical characteristics of a species, but also to its behaviour. The extraordinarily complicated behaviour of the social insects, such as bees and ants, is surely the product of evolutionary forces and these behaviours must somehow be imprinted in the genes. The question arises then, to what extent are human behaviours the product of evolution and does this provide us with a theory of values.

A first reaction is that altruism, a quintessentially religious behaviour, surely disproves this, because it is behaviour which imposes costs on the individual following it. This, however, is incorrect because evolution acts through the genes which form the information passed from one generation to another. A complex of genes tending to altruistic behaviour will propagate throughout a species if one individual’s behaviour, although carried out at a cost to themselves, nevertheless benefits other individuals sharing the same genes. This provides an evolutionary explanation of bees dying to defend their nests because they are benefiting the other bees in the nest with essentially the same set of genes.

What this means is that altruistic behaviour can be *adaptive* – that is, result in individuals having that behaviour leaving more descendants than those who do not manifest it. The crucial point is that the behaviour must benefit individuals with genes in common. You are altruistic to your kin and this must surely lie behind our feelings for family. We say, blood is thicker than water, and evolution provides an explanation as to why.

The major religions of the world support altruism too, but it is not obvious that this evolutionary explanation either supports or supersedes the religious one. In a way, it would be surprising if the right or wrong which flows from God could not be expressed in God’s creation because it always resulted in the diminution of the descendants of those who follow it. An evolutionary explanation of a value may add to a religious injunction, but does not invalidate it. It just means that “Honour thy father and thy mother” is sensible from an evolutionary point of view as well as a religious one.

Another example will take this argument further. The human species exhibits sexual dimorphism, that is, men are bigger and stronger than women. Where a species exhibits this trait it tends to arise when males have to defend access to females from other males. The lion, for example, is bigger than the lioness because it has to fight off other lions. The lion does not use his superior strength in hunting because the lionesses do all the hunting and when they have brought home the kill, the lion chases off the lionesses to help himself to the lion’s share. The lion is not the king of beasts,

but rather the king of slobs and unfortunately one can see some of these traits in human society. Positively, there is chivalry, but negatively there is the subjection of women. Christianity, on the other hand, teaches that men and women are equal in the sight of God. This value conflicts with the evolutionary explanations, so where has it come from? Religious values go well beyond what evolution can hope to explain.

One can extend the theory of evolution, at the cost of a considerable loss of precision, by considering information which is transmitted culturally between generations as well as that which is passed genetically. This means we are not regarding different cultures as different species, but are using evolutionary terms to explain the spread of ideas and concepts. With this broader definition, religions can be explained as adaptive traits. As an example, most prehistoric religions seem to have been concerned with astronomy and one of the products of that was the definition of a calendar. Now this must have been highly adaptive because knowledge of the seasons allowed man to spread out from the relatively unchanging weather of Africa into other latitudes where knowledge of the season was a matter of life and death. Just imagine a world without clocks or calendars. Agriculture is dependent on the seasons. Sowing a crop at the wrong time could result in loss of the harvest and people not surviving the winter. Calendars are adaptive and we got them initially from religion.

One can compare this with bird migration which is also a response to seasonality, and arrived at without the benefit of religion, but being instinctive, that is encoded in the genes, the behaviour is inflexible and takes a long time to evolve. Like the genes, religion acts as a store of information between generations, but changes, and adapts, far faster than any genetic mechanism.

So you can argue along these and other lines for the adaptive nature of religion, but the same argument means you can argue even more strongly for the adaptive nature of science. The invention of the calendar makes astrology obsolete. Has science made religion in general obsolete and left us only a set of stories which are best ignored?

In many ways, and for many religions, I would say yes. Fertility is not affected by sacrifice. I cannot find any use for propitiation in any form. Illness is not caused by evil spirits. The positions of the earth and planets do not affect our lives in any way except as science predicts. These examples could be multiplied: religions contain more junk than a teenager's bedroom and it is as well to recognise that fact. But the problem is to recognise what is junk and what is valuable. Seeing how a religion works and propagates itself may well be useful in making this decision, but often evolution is simply irrelevant as an explanation of religious values.

But even if one could say that a religious behaviour was adaptive, that by no means obviates the need to justify following it. Altruism may be adaptive, but if this is the only reason for it, it is not a compelling argument for the individual making the sacrifice. The theory of evolution is a bit like Pandora's box. If once you think your behaviour is only the result of adaptation, you, as an individual not particularly concerned about future generations, are quite at liberty to follow your own self interest from which many of the things we recognise as evil in society arise. If you only believe in self interest you end up with a society like the Mafia, motivated only by the pursuit of power and totally lacking in compassion, a society which most atheists would reject. The values that take us beyond this are religious values: they cannot be justified and you have to accept them in faith.

Acting in the light of uncertainty

Values provide criteria by which we might judge a course of action, but goals are used to suggest a course of action in the first place. Goals are what people use to make their way in the fog of uncertainty. This is because they define a purpose for our lives and suggest what we are trying to achieve with it. Values are passive, but goals are active and they, too, are what religion is all about. Just as science is free from values, it is also free from goals. It is no part of the business of science to say why we are here, or what we ought to do with our lives. But science *can* show why we might need goals, because it shows how and why uncertainty enters into our lives and why we must act without knowing what the consequences of our action will be.

Prediction is what science is all about, because the test of any theory is that it can predict some situation which can then be tested by experiment. Everyone is used to the split second prediction of eclipses, so it is easy to think that science can predict everything. Unfortunately, predictability only applies in very limited circumstances. For example, trying to predict the weather, at least in the uncertain climate of Great Britain, soon dispels this idea that science can predict everything. Although the science of weather is well understood, it is governed by non-linear equations which contain instabilities making the solutions sensitively dependent on initial conditions. This is usually illustrated with the well-known, and probably incorrect, statement that the flapping of a butterfly's wing in America could change the weather on the other side of the Atlantic. The prediction of the weather for a given day in one month's time is beyond our capability, and probably always will be so.

In the face of this particular uncertainty, science can still help because although the weather is wayward, the climate is less variable and one can estimate probabilities. Insurance, flood protection, harvesting and farming in general are all cases where it is possible to make decisions based on probabilities, usually with some provision for extreme events. Thus in most day by day decisions, you can take a chance, but do not need to question where you are going. But in the longer term, and in the inherently uncertain areas of life, religious goals are important. Even in the mundane field of weather, climate change makes us think about our way of life and long term goals. Do we give up farming? Should we protect the environment? Deciding to preserve bio-diversity for example is much more of a religious goal (that is, arrived at by faith) than a scientific one (that is, justified rationally).

As we apply science to areas which are closer and closer to human nature, the uncertainties, and the consequent need for goals, become greater. Economics and politics, for example, are riddled with many more uncertainties than weather forecasting, because they lack much of the scientific foundations which underlie meteorology and even if they had them, the interactions would lead to much more non-linearity. As an example, in politics it is very difficult to predict the outcome of a policy such as increasing educational provision. In this uncertainty, the need for, and the type of education, are determined by goals which have a religious aspect. Does this policy arise from the belief that individuals should have access to greater choices which education provides, or from the belief that it will be for the economic benefit of society? That is a question which is determined by the values and the goals one has for society and this in turn affects the type of education to be encouraged.

Specifically religious goals, such as getting to heaven or attaining nirvana, tend to be high level and flow down into other goals which are themselves non-religious. Religion usually enters into these judgements by applying religious values to these

goals. For example, it is a religious view that *love* of money is an evil, not money itself. Being rich is only important as a means of doing some good. Consequently, I would say that values have a more important role to play and the values a religion teaches are what it is really all about.

Does the science of consciousness help?

The closest approach that science makes to human nature is when it attempts to tackle consciousness and the question arises as to whether, in this new science we can find an explanation for our values and goals and a rational way of dealing with them. This is a difficult area, largely because it is difficult to define what consciousness actually is, which seems odd bearing in mind that it is the one fact which is constantly before us every waking hour of our lives. But that is the basis of the problem: consciousness is only experienced subjectively – you cannot take it out on to the bench and take it to pieces without destroying it. But it is worth thinking about what consciousness means because it is at this point that science seems to be tackling the very basis of religion. Unconscious beings cannot do religion. The dinosaurs did not believe in God, any more than they did mathematics.

Consciousness is a very slippery subject, but one of the most vivid experiences of it is felt by anyone undergoing general anaesthetic. At one moment you are fully conscious and then you are switched off, just like a computer with a power failure. Recovering consciousness is almost equally swift: suddenly you are back in the world, hearing people carrying on conversations over your comatose body. But during the time of unconsciousness, you are not dead. Breathing, the beating of the heart and all the autonomous activity which keeps you alive still persist. In fact the amount of activity in the body which can be directly ascribed to consciousness is quite small, and localised in the brain.

Unconscious activity takes place even when we are conscious. For example, in typing this essay I do not have to be conscious of every key stroke. My fingers type the words unconsciously. I have a theory that the communication between my conscious brain and the unconscious typing activity is based on the oral language because the fingers frequently type “there” when I distinctly told them “their”. The point I am making is that unconscious activity is frequently of a high level. Here is another example. How many of us have arrived at the office in the morning without a single recollection of how we got there. It is probably not a good idea to be thinking of other things while driving, but it nevertheless seems to be the case you could drive a car over a familiar route without being conscious at all.

The complexity of unconscious activity makes it difficult to be sure about whether other creatures are conscious or not, but scientifically one tends to make the assumption that they are not. The marvellously complicated behaviour of honey bees for example, with their ability to forage in a complex environment, to communicate sources of nectar by the waggle dance, to defend the hive and look after the young is almost certainly instinctive. Bird migration is another example. Swallows do not say, “time for our winter holidays” when autumn comes round, but the day length and weather trigger a change of behaviour. In other words, the same parameters give the same response and it is not necessary to invoke conscious choices to explain their behaviour.

Now, supposing you were a Martian (and scientists, as we know, are Martians) how would you know that humans were conscious? Some of the things you would look

for would be adaptability and awareness of self. For example, robins will attack mirrors because they interpret the image as another robin. This might imply they have no awareness of self, which you would think would be necessary for consciousness. Chimpanzees, on the other hand will use mirrors to groom themselves: they recognise that the image in the mirror is their own. One would be inclined to think, then, that robins were not conscious, but chimps might be, at least to some level. Consciousness seems to be about high level behaviour, in particular, making choices and seeking strategies to respond to the environment. This sort of problem solving behaviour can be seen in many animals, but particularly chimpanzees, which, genetically, are closely related to us. But having said that, the degree of consciousness manifested by animals other than man is surely much less. Chimpanzees do not do science, or politics, or art, or music, or history or mathematics, or religion. Are all these the product of uncontrolled development of consciousness, like the peacock's tail is a runaway development of sexual selection?

This is a difficult question to answer. It is clear that science and politics are adaptive and relate to reality. You can, for example, test the outcome of a policy. But what is the purpose of music, for example? Does it signify anything apart from the fact that people find certain sounds pleasant, or at least interesting? I would say so, but I would be quite hard pressed to say what, exactly. I would argue that there is good and bad music and that this is not just a question of individual taste. But I do not believe the science of consciousness is going to provide much help. I cannot see us having a scientific justification for saying that Beethoven writes good music. Certainly, I expect it will be possible to show certain types of brain activity in response to Beethoven's music, just as certain types of brain activity will occur in response to an understanding of Pythagoras' theorem. But that is not the point. The question is, is the theorem true and is the music good? And are these two statements equally meaningful?

Great music is not a question of making nice sounds – that is the art of the advertising jingle. Great music can move you to tears. Like great art, it can confront you with what it means to be human and that too is a religious quest with no rational justification but which you can only follow in faith. And this applies in almost every aspect of human endeavour. Science, for example, is usually justified from the benefit it might bring, but for scientists this is only a partial motivation, often forgotten. For example, the search for the Higgs boson (a particle which is thought to be the origin of inertia in matter) is unlikely to bring any practical benefit to society, but we pursue it because we think it is important to understand the fundamental nature of matter. It is a religious quest.

Science, music and religion must all manifest themselves in some form of brain activity, but to say that brain activity causes these things is to put the cart before the horse – not a satisfactory way of progressing. No doubt higher levels of analysis can throw some light on religious beliefs, music and science: music criticism, for example, is not a meaningless activity. But even with this higher level analysis, questions remain, because just as with evolution, if you have an explanation for values, that is not a compelling reason for following them. Justifying values in almost any aspect of human life sooner or later gives rise to unanswerable questions. It is always possible to keep on asking the question, why, and we use religion to terminate this series when the questions become unanswerable. 'Why do this?' 'Because of that.' 'Why do that?' 'Because of the other.' At some point, to the question, why,

you answer, God, which means, shut up, you are not going to get any further. It is a recognition of our limitations and where religion must inevitably enter in.

Is this too much of a limitation?

What I have been trying to establish is that the values and goals we live by cannot be decided by science or rational thought. Whatever theory we have as to their origins, such as evolution, brain impulses, cultural influences or even what you have just eaten, the question arises as to what we do with this knowledge. And this involves what values and goals we accept, given that these influences undoubtedly exist. Each of us, using our limited reasoning power and knowing we have prejudices, has to make a step of faith to adopt the values and goals we actually live by. This step of faith is greater when we go against our prejudices, but the fact that we have the ability to choose what values and goals we live by, means it is always there and this is what religion is all about.

Many religious people will be disturbed by this because it seems to be too limiting: if religion only applies to what science cannot explain, does this mean that it is unimportant, only to be used for the weird bits of life? If we cannot pray to change things, what is the point of it all?

To answer this concern and illustrate the different ways we use science and religion, I would like to take a concrete example, namely the Apollo 13 disaster. This occurred in 1970 during the series of expeditions aimed at putting a man on the moon. During the 13th expedition an oxygen tank exploded, damaging the spacecraft. The three astronauts were, however, brought back alive by reconfiguring the spacecraft and returning it to earth using the very limited capabilities still functioning. During the days when the crippled spacecraft was returning to earth it felt as if the whole earth was praying for them. Did those prayers work, and if so how?

The reconfiguring of the spacecraft and the working out of the revised trajectory within the fuel and power budgets available was a technical tour de force, a credit to NASA and American technology. But did a miracle happen? One can only say that, as far as we can tell, it did not. There are always risks when pushing technology to its limits and stressing components beyond their design parameters, but everything worked according to plan. Knowing how many things could have gone wrong, I myself would call it a miracle, but did prayer bring it about?

That is debateable, but where prayer, and certainly values, entered in was in the determination of the ground team to bring the astronauts back alive and the determination of the astronauts themselves to land safely. Different values would have had different outcomes. Classical heroes died in battle – a glorious death in some people's eyes even today. What would have happened if the astronauts had been Spartans – or even from a different country. I would say that the decision, and the resolve, to bring the spacecraft back at any cost was the result of values, reinforced by prayer, and this was quite as important a factor as the technical competence shown.

When we balance the different contributions that science and religion make to a situation in this way there is a feeling that we are somehow diminishing God by doing so. The phrase "God of the gaps" is often used with the implication that the gaps are getting smaller and less important. To this, I would say that human knowledge is how God often acts in the world. The doctor's knowledge is God-given and true religions

ought to search for and delight in such knowledge. But there will always be limitations to our knowledge and it is here that we must act in faith. I do not know whether to call these gaps small or large, but I do know they are extremely important. Your life is affected far more by the values and goals you adopt than by the explicable forces that affect our everyday lives.

The purpose of belief

So far, I have been talking about values and goals as almost interchangeable with religion, but religion includes belief and discipline as well. And of these four components to religion, values, goals, beliefs and discipline, it is belief which causes the most difficulty. Discipline is, it seems to me, entirely pragmatic – if it helps, do it, if it doesn't, don't. Values and goals can be discussed productively, but sooner or later, where there is a divergence, you need to refer back to beliefs, and different beliefs lead to different values. So in order to understand the role of religion, we need to go more deeply into what belief is all about.

The point of religion is to decide what is good and then to follow it. But deciding and following are both difficult and get more so with every passing year. Now it is often thought that religion does this by providing a rule book, like the ten commandments in the Old Testament. Rules certainly have their place, both in religion and in ordinary daily life. It is certainly worth laying down some simple rules such as stealing is wrong and you had better agree which side of the road to drive on. But rules have a habit of getting out of date and of being difficult to apply in complex, real-life situations. What we need then are some general principles from which you can derive a particular application. And these general principles must reflect reality in a simplified way, so that we can understand it and take appropriate action. If you are dealing with embryo research for example, you need some religious principles to say what is the value of an individual as opposed to humanity as a whole and at what stage are we actually dealing with an individual. In religion, these principles are captured in stories about our nature and purpose and it is important that as far as the principles are concerned, these stories or beliefs should reflect reality, because we are going to act on them. If what you believe does not reflect reality, then at some point your beliefs will let you down. It is perfectly possible, and consistent, to believe the moon is made of green cheese, but this belief does rather conflict with the reality of astronauts arriving on its surface.

A belief about the moon being made of green cheese is obviously a belief about the physical nature of the moon and is easily tested, not only by going there. Religious beliefs on the other hand, are about values and goals: what do we hold good, and what is our purpose in life. Although religion is concerned with our relations with each other and the world around us, the actual values we follow are essentially subjective. The objective tests one can make on the actions religious beliefs lead to, are secondary: that is, indirect evidence of what people really believe and experience. The reality that religious beliefs should reflect is within you.

As a mathematician, I would say that beliefs should *model* this reality. In mathematical terms, a model is a simplified version of some aspect of reality. A model train for example is a smaller version of full sized train which children can use to play with or an adult can use to design marshalling yards or new trains. We use models all the time. For example, a map is a model of the countryside. Unlike a rule, it does not tell you where to go or how to get there, but you are much more likely to

arrive if you use one. Models can be very abstract. Take the London Underground map, for example. This is certainly a model of reality, but it has only one purpose: it tells you what trains you need to catch to travel from one station to another. Different lines are shown with different colours and this indicates where you have to change trains. You must understand that to interpret the model: it does not reflect any other aspect of reality. If you look at the rails the central line trains run on, they are not red, any more than the Circle line runs on yellow ones. The colour on the map is only there to indicate the connectivity.

Models have a purpose, a domain of use, and they should not be used outside this domain. The underground map does not say anything about the distances between the stations. For example, to go from Holborn to Paddington Station you are better off going to Lancaster Gate and walking, rather than changing at Oxford Circus, because you can walk to Paddington from Lancaster Gate quicker than changing trains at Oxford Circus. Models should not be used outside their domain – they will be misleading.

Thinking about beliefs as models of reality shows us straight away what difficulties there are in comparing them. First of all, they are about goals and values and we have already suggested that these do not have a rational basis. We are dealing with the bit of reality that science cannot deal with, so exploring it is going to be difficult. Secondly belief is about that part of reality which is subjective. It is hard to do experiments, although the experiments on how the brain works must surely help us understand belief. And thirdly, the language of belief is cultural: people are brought up in a religion and express themselves in the language they were taught in. Imagine how difficult it would be to explain the orbits of the planets if the people you were explaining to only knew geometry and you only knew algebra. Or simply imagine the problem of giving directions to a stranger in a city. You have a model of the city in your head, but you have to explain it to the stranger in terms of directions.

Another problem is that you cannot always expect to apply reasoning to models of reality. One of the most interesting things that science has discovered is that reality is not subject to commonsense. Experiments show, for example, that a particle can be in two places at once or that time goes more slowly when you are moving rapidly. These manifestations of reality make no sense: they are paradoxical when considered against our ordinary every day experience. Nevertheless, they are demonstrably true. When dealing with phenomena outside our experience we must be prepared for paradoxes and this must apply to beliefs. I would go so far as to say that a rational and consistent set of beliefs is almost certainly going to be wrong. In the past, theologians talking of God have used words like omniscient, omnipresent and omnipotent. How is it possible to use these words consistently and meaningfully? The correct approach for most of our thinking about God ought to be to acknowledge our ignorance.

The one conclusion we can draw from all these difficulties in the way of analysing beliefs is that we should not be dogmatic or certain that we have a total grasp on the truth. It is unfortunate that, in practice, people cling to their beliefs with the tenacity of a compulsive gambler believing his luck will turn. There seems to be no limit to what people will believe or to the extent of their commitment to it. My favourite example is the curious sect who believed that by committing suicide they would end up in a spaceship flying behind Halley's comet. There is no doubt about the tenacity of their beliefs, but few would say that they had any connection with reality.

Why are people so certain about their beliefs? There seem to be two reasons and the first is that beliefs are subjective, they are experienced. Seeing is believing we say and our experience of God, or nature, or eternity confirms a belief which is then expressed in elusive religious language. But science shows that subjective experience can be misleading. From optical illusions, through conjuring tricks to a belief in the essential goodness of humanity brought on by a good meal and a glass of wine, there are any number of illustrations of the untrustworthiness of experience. To the religious, I would say that I am not denying the existence of revelation, but we should bear in mind that our experiences can be misleading, we can misinterpret them and we can express them in language that others find incomprehensible.

The other reason for the tenacity of belief is the necessity for commitment. You can believe that a bungee rope is strong, but it requires a certain amount of commitment to leap into a void on the end of one. The problem for religious belief is that it calls for that commitment in a way which belief in the strength of a bungee rope does not. The role of commitment in religious belief is so important that I would like to mark it by making a distinction between faith and belief. Beliefs are supposed to direct and inform our actions, but it is only faith which enables you to undertake them. Consequently, faith is much the most important part of religion. What people say is often at odds with what they do and how they live and it is the inner faith, what they really believe, that matters. A belief which is not expressed in life is meaningless. Religion is to do with the values and goals we actually live by. Anything else is just lip-service.

If we are to talk about religion then we must talk with people who are experiencing it and living by it, and naturally they will be tenacious in their beliefs. This applies even to atheists. The thought that there might be more to life than science can say is just as challenging to the atheist as the opposite thought is to the religious person. Nevertheless, if we are to have dialogue, some acknowledgement of uncertainty must be made by all parties. You cannot argue with someone who thinks they have a total grasp of the truth. But if you are to have dialogue between religions, you must have some basis on which to compare them. Is this possible?

Can beliefs be right or wrong?

Beliefs affect and are affected by reality and one can say they are right or wrong according to how well they reflect reality. Science and religion have this in common and where they are concerned with the same aspect of reality, they are competing explanations, and science usually wins. We started with agriculture and the worship of Baal, but it is pretty obvious that a dressing of fertiliser is effective and sacrificing to Baal is not. That religion, at least in that respect, is wrong.

As we move to aspects of reality which are within ourselves, distinctions start to emerge as we encounter things which science cannot deal with, but the boundary is blurred. Take medicine for example. The immune system and how our bodies work are the subject of science, not religion. But healing does involve religion. A determined and cheerful patient is much more likely to get better and religion can give a purpose to life and lift the spirits to do just that. To the extent that it can do this, religion is right. But if the hopes it arouses prove on experience to be false, it is wrong.

Looked at in this way, a religion could be about well-being, a very restricted set of values and goals. Yoga, as practised in the West, is probably a good example: people

go to Yoga classes to feel better and become more supple, not to attain union with the universal soul. Within this restricted domain, I have no doubt that Yoga works. I doubt whether New Age beliefs, such as the healing power of crystals, are half as effective. These beliefs about the body, and I could include chiropractic, osteopathy and homeopathy, are really scientific theories. The only problem with incorporating them into mainstream science is that the experiments to test them objectively are hard to carry out.

When you go beyond these rather objective values to the more subjective ones involving good and evil, the tests can only be made subjectively – you have to live the choices you make. Of course, we assess the outcomes of our actions which can be done objectively, but whether these outcomes are good or bad is still a subjective judgement and it is here where you must have a religion and science is no help. So a belief about the real world, such as a gambler's belief that he will end up winning, can be right or wrong because it can be tested. But a belief such as it being morally wrong to have people kill each other for the entertainment of others can only be tested subjectively: you either believe it or you do not.

In this case, whether this belief is right or wrong can be interpreted in two ways: in one, what is morally right or wrong is simply a matter of what a group of individuals believe. Gladiators killing each other is right for the Romans, wrong for Christians. But Christians, and most modern religions, would reject this interpretation and say that a belief is right or wrong insofar as it reflects the nature of reality outside ourselves, and this reality includes God, the source and origin of good.

Whether religion is essentially a social construct or alternatively actually does reflect some form of reality outside ourselves is the most fundamental decision one can make, because the two different interpretations have quite different outcomes. If you believe that religions are simply a matter of culture, you may conform to the society you live in in order to be comfortable, but only so long as it does not cost too much to do so. You are unlikely to be worried about poverty or violence in the world as long as they do not affect you. You are unlikely to be concerned about future generations at all. Some religions are like this: simply there to keep the status quo of the believers. We all know that God is English, do we not? But if we really look at the heart of a religion and cast aside our wishful thinking and prejudices we find self sacrifice as a principle and this applies to many religions, not just Christianity. And, like most religious people I would say this reflects something of the nature of God, and the religion is right insofar as it accurately reflects this. Unfortunately, you cannot put God into a test tube, so there is no escaping the essentially subjective nature of the decision to follow one religion rather than another.

But religion we must have. We need religion to take us beyond self interest and we need religion to stop the endless regression of asking why and instead getting down to doing something. If we say this corresponds to no part of reality outside ourselves we are denying any motivation apart from self interest and any freedom we have to choose our way of life because it is determined by the way our brains work.

The nature of authority

Given that we recognise the difficulties of dealing with our subjective experience and of going beyond our preconceptions and prejudices, how do we deal with the voyage into the unknown which is our life? What tests can you apply to review where you are going? From the Christian point of view, the traditional answer is that you test

against authority. And authority within the Christian religion is either held by the church, the bible, or reason, with the different branches of Christianity placing different degrees of emphasis on each. However, this view of authority rather neglects the nature of faith which is subjective and expressed in life. The ultimate test of any religion is not whether it agrees with the bible or the teaching of the church, but with whether it meets the needs of your way of life. People change their religion because they are dissatisfied with how they are living and in the long run this is the only test which counts. Unfortunately, this is not a test which you can undertake dispassionately like a scientific experiment. The essential point is that you must live the religion and you cannot do that without faith.

And it is here that the sources of authority come into play. We only have one life and there is a limit to the number of faiths it is possible to try. It is perfectly possible to believe in golden haired guardian angels with wings, but practised as a faith, it will fail when things go wrong. The traditional faiths encapsulated in the sources of authority, have a bundle of beliefs which over the centuries have been found to work. Better to stick with one of these than hop from one new age belief to another. But how can you use these different authorities and how can they be relied on.

Anyone calling themselves a Christian is to some extent referring to the church as an authority. But anyone familiar with the history of the church, with the crusades, the corruption and misuse of power in the middle ages, its intolerance and its frequent indifference to the poor can wonder how such a body can have any authority at all. But the mistakes of the past are part of the message: like any history they act as warnings for the future. The church is not short of good people and we need to listen to them. How do we tell the good from the bad? One way is to see if what the church is saying is for the propagation of the church or not. Mistakes have arisen in the past from people pursuing power, so the church is more likely to be right when it is powerless, rather than pursuing its own interests. But the question remains as to how we judge.

Any human organisation is subject to error, but we use them as authorities nevertheless. Even science is not exempt from human authority. In science, the ultimate authority, like faith in religion, is the experiment. But doctors do not do experiments and we accept their word as authoritative. That authority comes from text books and a general consensus in the medical profession: it has been terribly wrong in the past and is not perfect now, but anyone would be foolish who did not take medical advice very seriously. Religious questions are subjective and not so easily settled as scientific ones but nevertheless, if you find yourself in a church of one or two like minded individuals in opposition to the world, it might be a good idea to question your grasp of the truth.

Like the church, the bible also poses questions as a source of authority. For a start it is made up of many different books, in many different styles, written at many different times. It shows a changing religion, from a tribal God for Moses and the patriarchs, a deepening understanding with the prophets, a revolution in the gospels and a working out of that revolution in the early church. It contains rules, like the laws of the Israelites in Deuteronomy and the instructions for young churches in the epistles. It contains history, poetry and stories. How can this extraordinary collection be authoritative?

In fact, I would regard diversity and development as being one of the main messages of the bible. The idea of God is not captured in a few brief definitions but the stories

in the bible show us people reacting to God, and in the process giving us glimpses into the nature of God and of ourselves. The bible is a record of God's dealing with men and women, both individually and collectively in the nation and in the church. The law in Deuteronomy shows the nation responding to God. Our response as a nation today will be different, but that does not mean that these laws will not repay study, even though they are centuries old. The stories in the bible are intensely gripping in their depiction of the response of individuals to God. There are the stories of the patriarchs, so fallible and far removed from our stained glass image of them; king David's grief on losing his son echoes down the centuries and strikes our hearts today; and the story of the crucifixion so relevant and so full of wonder in its implications. These stories reveal something about the nature of God and ourselves more effectively than any number of volumes of theology.

There is no doubt in my mind about the authority of the bible, but it may be that an analogy will be helpful to those who remain doubtful. Like Christian theology, English Literature has the idea of a canon. In theology, the canon is simply the list of books of the bible with the qualification that the church recognises them as authoritative. In literature the canon is the consensus on the set of works in English which you must have read before you can do any criticism. It is not the case that you must copy the style of some revered author, but if you have not read Shakespeare, Jane Austen and the rest of the canon, how do you know what potentialities there are in the language and how could you criticise new writing? And equally, if you have not seen how God dealt with men and women in the past, how can you be confident about what you believe now?

Within a traditional faith there is both variation and development. Going back even a hundred years will show that all the major religions have changed: they have to adapt in the light of changes in our environment and in our understanding and it is here that rationality plays a part. Beliefs should be consistent, articulated and thought through. A terrorist who thinks he can kill others and still call himself a Christian is surely mistaken. There is need for plenty of rational thinking in religion, but the ultimate question is whether religions make any sense at all: do they have any relation to reality? And the only way we have of testing whether our beliefs actually do model reality or not is to see how they are expressed in our lives because that is the only reality that is relevant, or indeed matters. I would say that religious disputes are pointless unless they have some consequences for our values and goals.

But in this subjective reality, rationality is necessary to criticise our beliefs and point out inconsistencies and logical consequences. Better to think through the belief than be led astray by the devices and desires of our hearts. Rational thought is useful in uncovering these drives which mislead us. It is useful to know how our minds work and where its vulnerabilities might be. It is useful to know the history of the development of religion and how the scriptures came to be written. It is useful to know how our behavioural traits have evolved. These things do not disprove religion but they are intensely useful in deciding what things might be wishful thinking or meet needs which are no longer relevant.

Some practical applications

The thesis I am arguing is that religions are about values and goals, with beliefs as a model of reality which can be used to derive values and goals for new situations. If you want to have dialogue between religions you need to talk about the values and

goals they lead to and how beliefs are used to derive them. To illustrate these ideas, I would like to take a few contemporary issues to show how they might apply, starting with what must be the most important issue in England today, how do we answer the atheists and those who say religion is irrelevant.

The importance of belief

An atheist is defined by what he does not believe, so I would like to convince him of the importance of belief. An agnostic might be thought of as someone holding the views I have been putting forward in this essay, but in my experience agnostics are short on commitment: if God is unknowable, they are not prepared to do anything about it. I would want to convince them that a step of faith is necessary to fulfil ourselves. The humanist, like the atheist, makes a point about not having beliefs, but does have a set of values. The problem comes when they try to convince others to follow them, because they do not have a compelling reason to follow one set of values rather than another. Humanists and atheists do have a concern for what others believe, a concern which is, I believe, justified. None of us wants to be killed by a suicide bomber and we all feel concern for justice and truth. But without belief, you get nowhere. Just saying you should behave like this because I say so is not a compelling argument.

To be human is to be conscious. To be conscious is to have theories about the world. It is absolutely inevitable that we should have theories about the values and goals we live by. The undoubted problems we have with religions are due to inadequate beliefs. Not recognising the importance of belief is to miss where the problems are.

The scope of belief

From its inception, the theory of evolution has been regarded as a challenge to religion but rather than recognising the exact nature of that challenge and what we can learn from it, many religious people have proposed alternative theories which they feel are more compatible with what they believe. Now it has to be said that most scientists, and perhaps all biologists, think these creationist theories are, to put it mildly, very dubious. As a result, creationism is a very considerable stumbling block to those who might want to believe – it is surely not necessary to leave our minds outside when we go to church. But it is important to creationists because the theory of evolution seems to be attacking the bible, and attacking the bible, seems to be attacking the faith. If the bible goes, doesn't the whole edifice of faith come tumbling down, in particular God's intervention in the world?

The answer is that the bible was never concerned with the structure and distribution of matter in the universe (cosmology) or with the process whereby species acquired their defining characteristics (evolution). But what the beginning of Genesis is concerned about is the attitude we should have to creation, an attitude of respect and wonder as the work of God. Genesis is about the values and goals we apply to the world around us, not about big bangs and beetles. As with all religion, it is nothing unless it tells us how to live.

But science, and in particular these two theories covering processes taking place over immense periods of time, does tell us something about how God in practice interacts with the world and how He expects us to use our knowledge. The life of faith is not a life of ignorance. If you want to go sailing tomorrow, look at the tide tables, rather than praying for a high tide.

The importance of interpretation

A current controversy for the Anglican Church is the issue of homosexuality. There are two sides to this debate, one concerned with whether homosexuality is a sin and the other with the interpretation of the bible and it is this second aspect which I would like to discuss within the framework of beliefs and how they are used. The problem is that classifying homosexuality as a sin is justified from a literal interpretation of the bible and the issue is concerned with just how far can we go in interpreting the bible, and to what extent it can be regarded as authoritative.

The evangelical position is that the bible, as interpreted by the Holy Spirit is infallible, because God is infallible. Consequently error can only arise in our interpretation of the Holy Spirit's guidance. To avoid this, we should choose a simple interpretation, namely, as far as we can tell, how the original hearers of the word would have understood it. Usually this is confined to values and goals: no one today believes we should conform to Jewish ceremonial laws and furthermore, the New Testament supersedes the Old, so we no longer stone women for adultery. This is an attractive, coherent and logical view. For the issue of homosexuality, the application of this principle is that although the interpretation of some texts is debateable, you are pushing it if you deny that the general tenor of the bible is against homosexuality.

The liberal side of the debate depends first of all on not seeing why homosexuality in itself should be sinful. If the only argument is that the bible says it is, then we should be careful of our interpretation. The key element of this is that there is clearly change in the way the bible has been interpreted, not only with the New Testament superseding the Old, but also within the Old Testament itself and within the New. Jesus, for example, obeyed the Jewish ceremonial law but Paul went beyond it. Slavery is accepted throughout the whole bible, but today we would say it was wrong. The bible contains nothing on paedophilia or torture. It contains nothing on eugenics, abortion or human rights. If we are to tackle any of the moral issues which face us today, we have to interpret the bible very generally, as from the command, 'Love your neighbour as yourself.'

And in this wider interpretation, it is legitimate to use other information provided by science, history and philosophy. If, for example, it was possible to establish that homosexuality had a genetic component, that would be a germane fact which would not imperil the authority of the bible, but would be relevant to our interpretation of it.

Clearly one cannot resolve this issue in a few short paragraphs, but in the debate it is useful to understand when we are arguing about belief, the interpretation of belief, or the outcomes of homosexuality when these are used to judge whether it is sinful or not.

The danger of certainty

At the heart of this essay lies a paradox. Religion is about what we cannot be sure of, but we may have to follow it at some cost to ourselves. Would you cross a bridge if you were not sure it could take your weight? Unfortunately, decisions have to be made and bridges crossed: if you are not to remain in bed all day, faith is inevitable. Churches often invoke authority to help people make the necessary commitment. The Roman Catholic church, for example, has an extreme view on this by saying that the Pope is infallible, but in practice, even reformed Evangelical Christians place a very high emphasis on authority. A literal interpretation of the bible in practice means a literal interpretation by certain leaders in the church. But before criticising either of

these positions, it is worth realising that almost all of what we believe in every day life is taken on authority: we believe the doctor's advice; we believe (most of) what is written in the newspapers. Authority is pervasive and most of the time we have to act on it.

But if the only argument you have for a belief is that the Pope says that it is so, then we are denying the reality of what we believe. Authority may be respected, but that does not mean you are excused from wanting to know the reason why. You may talk about a belief in terms of the values it gives rise to and you can relate it to society and the physical world, but some justification is necessary other than the say so of a fallible human being.

Infallibility is the enemy of dialogue. The militant atheist, the Islamic or Evangelical fundamentalist, the authoritarian Roman Catholic can admit no dialogue short of total surrender. But uncertainty is a fact of life. There is no field of human endeavour where we can be totally certain and it is a strength to admit this, not a weakness.

Conclusion

Deciding on the boundaries between science and religion, or having a dialogue between religions involves having a clear idea of what religion is. In this essay, I have been arguing that a religion is a structure consisting of beliefs; values and goals; and practice. The beliefs should form a model of reality from which we can derive values and goals for every day life. The practice is there to help you follow them.

Religious beliefs are usually expressed in terms of stories. These stories may have a historical context and the truth of that may support the story, but as far as the application of the belief is concerned, the historical truth is irrelevant. The bible is not a historical archive, it is more like a text book which is meant to be used. Like a text book, it has its application and the stories in it are designed to help the understanding of that application. Taking the stories literally is to misunderstand what they are about. Religious stories do not need to be historical to be useful in giving us realistic values and goals.

But they do need to be interpreted, and this is usually the most difficult aspect of any thinking about reality. In the physical domain for example, engineering is not just about calculating stresses and strains, it is about interpreting the results of a scientific calculation in terms of real life bridges and buildings and the ability to do this is what distinguishes an engineer from a mathematician. These are two entirely different professions. The interpretation of religious beliefs is a key issue for today, where so often, people try to apply them outside the domain of values and goals, or in a superficial and literal manner.

Values and goals can also be the subject of science because they can be observed sociologically and neurologically. They can show how values and goals might conform with social expectations or require one to go against them and they can show the consequences of adopting them. This is all very useful, but values and goals are not created by science: that is the purpose of religion.

Looking at religions in this way allows them to be compared and analysed. It is useful to dig down to the real beliefs, the ones which influence actions. It is useful to look at them historically and learn from our mistakes. And it is useful to check beliefs for consistency. In these ways one can discard a lot of differences which are only superficial. Two different beliefs could still reflect the same reality. This

frequently happens in science. Chemists and physicists for example, look at the world in different ways, because they are looking at different properties and as a result use different models. Even when it is the same domain two different models can apply. For example, gravitational attraction can be described either geometrically or algebraically and the choice is often a question of which branch of mathematics you are most familiar with.

Similarly, two different religions may have more in common than might appear. If two different religious beliefs always give rise to the same values and goals, one can suppose the differences between them are not fundamental. But if the same religion gives rise to different values and goals the difference must be due to interpretation. Agreeing on what religions are about may not solve all the disputes in the world, but it should remove some of them and help to clarify others. And this is, perhaps, the most important issue for our time. Friction or harmony, peace or war and the whole future of the planet are affected by our beliefs and to dismiss them as idiosyncrasies of individuals is to miss the point. Beliefs are important and we need to understand what they are.