In our Time Programme 79
Science and Religion

Melvyn Bragg : Hello, what space should science leave to religion? What ground should religion give to science? Do they need to give ground to each other at all? The American palaeontologist Stephen Jay Gould tackles the old problem in his latest erudite and - odd adjective perhaps - charming book "Rock of Ages - Science and religion in the fullness of life" . In it he writes: "Science tries to document the factual character of the natural world, and to develop theories that coordinate or explain these facts. Religion on the other hand, operates in the equally important but utterly different realm of human purposes. In other words science studies how the heaven's go, religion how to go to heaven, the rocks of ages and the age of rocks." But do the two realms really exclude each other?

With me to discuss whether religion and science can be so happily divided is Stephen Jay Gould himself, the Agnesy(?) Professor of Zoology and Professor of Geology at Harvard University. The Roman Catholic Philosopher John Haldane, Professor of Philosophy at the University of St Andrews, and Stanton Lecturer of Divinity at Cambridge University, and also with us, the Sociologist Hilary Rose, Professor of Physic, and emeritus Professor of Social Policy at Bradford University.

Stephen Jay Gould at the heart of your argument in this book, in rocks of ages, there's a principle you call non-overlapping majesteria or noma, will you first of all elucidate that for listener's please?

Stephen Jay Gould : Oh why not invent a little acronym for an important principle? I actually borrowed the term from my Catholic colleagues. A majesterium is a teaching authority and its etymological definition is from Agysta, teacher, the majesterium or teaching domain of science is the factual domain of the universe, and why its made that way rather than some other way, fact and theory. The domain of religion as I understand it is a discussion of ethics and values and the meaning of our lives, and why we are here, in the spiritual rather than factual sense, and these are both awfully important sets of questions. But they are entirely different, and one's attitude on one subject should not really affect what you think about the other, and in that sense they're non-overlapping majesteria, which doesn't mean that they hate each other or shout at each other across divides, because any serious question, any important question in human affairs has both factual and ethical dimensions, so scientists and religious folk have got to be talking to each other.

Melvyn Bragg : Let's start with science and the majesteria of science, the realm of science, what belongs to Caesar, I mean what belongs to science.

Stephen Jay Gould : To science belongs the attempt to understand the factual character of the natural word, which is factuality, often hard to ascertain, or ideas about it alter, but there's a world out there and it's one way rather than another, though it's difficult to figure out how often. And then because science can't just be descriptive factuality, science is also an attempt to understand why the world works that way rather than some other way, a theory so to speak and that's what science does, it merely ascertains or tries to, how the world's made and why it's made that way, that's a very very big subject and it's a fascinating conflict, a confusing world out there. But none of that is going to teach you the ethical basis of human behaviour.

Melvyn Bragg : John Haldane, would you agree with that definition of science? Do you see science as basic as Stephen Jay Gould has expressed it, given that from these simplicities come enormous complexities as we know?

John Haldane : I think to some extent it oversimplifies about science itself. This emphasis in factuality and on nature, I mean among the things that science might investigate for example are the operations of the human mind, concerned over certain kinds of facts, but those facts have a complexity and a character that is unlike that say of basic physical or biochemical facts perhaps. So for instance there's the science of reasoning, if you like, looking at logical inference, which is concerned not just as well with what is a matter of fact people *do* think, but with what they *ought* to think. Or if given they think one thing, what they ought to think next. So questions of consistency, coherence and so on.

Which are absolutely central to the *practice* of science, what counts as good evidence, what counts as good arguments, those very notions "evidence", "argument", "good reason " and so on, in some sense fall within the

domain of the factual, but they're not facts like the presence of particles in the void, so I think even when we think about the domain of fact long before we get to questions of religion and morality, there's a complexity there, that might, so far at any rate, not be fully captured.
I think I prefer the idea of different kinds of aspects, or even better perhaps two prospectors, because I think it's unlikely that the religious believer is going to want to yield over vast chunks of reality as it were as being outside their domain or their concern. So I have some sympathy with the idea of a duality here, that there are two kinds takes if you like, but I think of these in terms of two prospectors on the totality. There's one as it were reality, science is concerned with its structure, with certain aspects of its operation, how its put together, what it does. Religion is concerned with its significance and its meaning.

Melvyn Bragg : Hilary Rose can I come to you on this same...laying the basis for this discussion? D'you agree with Stephen Jay Gould, again his book is the starting point for this discussion, that the purpose of science is to discover and communicate to us the facts of the natural world, and that is the majesteria and the domain there.

Hilary Rose : Well, for me always such things have to be historically contextualised and so the concept of science is constantly shifting changing, and what Stephen's trying to do I think is pull out some sort of irreducible minimum inside science. But the huge and dramatic changes that have taken place since the birth of modern science in the 17th century, are absolutely enormous, and so what I want to do is open up a nasty little thing which Stephen's own words invite me to do, and that is he asks us to take a cold bath, he Mr Darwin, when looking at nature, and I want us to take cold bath before we look at science and religion, and not talk so much about the irreducible minimum, but science as it actually is, which is I think a great deal often nastier and more complicated and much less attractive than this beautiful image of science that Stephen offers us.

Melvyn Bragg : Well with such an introduction, we have to have the second paragraph!

Hilary Rose : Well, I mean for example, we're almost at the end of science, in the way that Stephen describes it, and that what we are seeing in the 21st century is the emergence of techno science - in which technology and science are enmeshed and that the dominant account of nature will be one that will is heavily involved also in changing nature at the same moment as describing nature, and that will come through the two dominant fields of biotechnology and information science.

Melvyn Bragg : Stephen Jay Gould?

Stephen Jay Gould : It was never really different when Bacon in the early 17th century developed all this imagery about raping nature so to speak, which is why feminists don't like him, though they should, because in fact he also gives the first very clear account through his idols, of why the scientific mind is freighted with all sorts of social and psychological biases as well.

I accept what Hilary says about the utility of science and I believe it has to be analysed in that social context. What I'm trying to do is to set aside its methodological operation is a different area from its social context I don't deny anything of what you said, in the same sense as I don't deny - even though I take this position -that in a logical sense of the enterprise of science and religion don't overlap, of course I don't deny that historically they have always done so which is why the perceived conflict exists.

But that's for an odd reason, if I can just take a moment, that is the human mind cannot not ask questions of an empirical nature like "why is the sky blue?" it's too fascinating, "how big is the universe?". There wasn't an institution we call science in its modern form until the late 17th century, so (indistinct), because there was no one else - those questions used to fall under the domain of theology, and nobody likes to give up turf, so when science rose, there were bound to be Galilean, Marfeo Barbarini , Urban the eighth type struggles, but the logical point remains sound, there have been turf wars, there are bigger ones in the United States now than you have here. But I think the basic position that I hold is both sound and humane and probably the right way for these two disparate disciplines to deal with each other, which they must do all the time.

Melvyn Bragg : John Haldane?

John Haldane : Can I go back and say a word about the origins of the notion of science, because I think it's

relevant to this? When we think about science now we really think about modern science, the science of observation and theory, but the term science comes from the Latin *sciencia*, which is concerned with a certain kind of knowledge, that's to say sciencia is defined not by what it's knowledge of - but the kind of certainty that it enjoys.

So in the pre modern period in antiquity, in the middle ages and so on, the aspiration to science was the aspiration was the ambition to have a well organised kind of knowledge.
In fact they even believed that you could deduce logically every bit from every other bit in some way, given certain kinds of general principles and so on. Now in that sense of science as sciencia - as organised knowledge - there can be all sorts of sciences, indeed theology in that sense, was sacred science, it was organised knowledge about God.

What we're talking about I think in this discussion, is science in the modern conception of science - science as it arose in the Renaissance in the 16th and 17th centuries - science as observation plus hypothesis, looking at the world, experimental method, conjecturing what might underlie the appearances, doing further testing and so on and so on, and I think it's interesting that the kinds of clashes that have been written about in this book - very interestingly I think - really originate in that period, that in the earlier period there wasn't a sense of clash . Somebody like Aquinas in the 13th century, felt no tension between the Aristotelian science received into the Western world from the Arabs and so on, through contacts through the Crusades and such like, no tension between that and the most orthodox kind of Catholicism.

Melvyn Bragg : I want to come back or rather carry on, with Hilary Rose's point. What you're saying it seems to me - crudely - is that Stephen Jay Gould's book is terrific as far as it goes, but in your view, science has changed now...

Hilary Rose : Yes.

Melvyn Bragg : ...so he's talking about a science that now today, as we sit here, isn't really going on to that extent anymore. Could you just develop that a bit more?

Hilary Rose : Well my trouble is, I mean here is this formidable man, and I'm thinking how am I going to tell him I think his view of science is romantic?

Melvyn Bragg : Well you've just said it so...!

Hilary Rose : Because historically it's gone.

Melvyn Bragg : That's a very clever way to tell him!

Hilary Rose : I try to protect myself but I mean there is this sense, that I feel this is the most wonderful thing...it's the same argument I have at home with Steven Rose, and I say "look the kind of science you love, and I want you and the other scientists to value this and want to protect this and keep it going as long as possible", but I hear the uggernaut of techno science marching down the road with the Human Genome Project, with information science, sort of transforming our society and culture as they go.

Melvyn Bragg : Well that's interesting so how does it change the argument that he's proposing?

Hilary Rose : Because this is much more tied up to the interests - in a very direct way - of industry and the state , it's much much closer than it has historically been.

Melvyn Bragg : Stephen Jay Gould, obviously you take Hilary Rose's point on board, does it, and if so how does it change your argument?

Stephen Jay Gould : But what I would say is that my notion of these non -overlapping majesteria is helpful in understanding that situation because the science of biotechnology - let's take a key example - Monsanto now they have stopped in part for our agitation, was trying to develop a gene that would makes seeds sterile, a totally immoral thing to do.

The only conceivable purpose wasn't to help agriculture, it was to force farmers to buy their seeds, year after year as they couldn't save their own. Now how does one analyse that? There is a science, there is a way to do that, it would have worked. The decision not to do it, and the pressure we put on them to stop their research, which thank goodness, *thank God*, for the moment, (chuckles) has been successful is a moral debate, and I think you have to separate those questions, the fact that it can be done genetically is one thing, you want to argue why it should not be done, you're in a different realm.

Melvyn Bragg : If we're talking....as we're talking about science and religion, it would be stupid not to refer to Galileo, which you do in your book, you take it on - it's a key...it's a symbolic dispute, it's far more complicated we know than it seems. Can you tell us, Stephen Jay Gould, what you draw from that, because you go from that in your book to the present way in which the Catholic church deals with evolution, but can you just give us a take on how your notion can be seen in the Galileo Urban dispute?

Stephen Jay Gould : The first thing you have to do is as you said to recognise how complicated the story is..Galileo..I don't want to be too much of a revisionist, Urban the eighth made a very bad move, but you can understand why he did. You're in the middle of the 30 years war, why does Galileo appear before the inquisition? He had to. The inquisition was the temporal authority at the time that the pope was the temporal Lord of that are of the world as well as spiritual ruler. The point being that Galileo was an incredible hot head, he was right he never should have (indistinct) to write that book. All he had to do was write and honest dialogue between a Copernican and a Ptolomaian, his point would have carried anyway, because the Copernican system was better, instead he named the character who was to carry the Ptolomaian argument Simplicio and gave him arguments just as good as his name. Now when Marfeo Barbarini, his old friend, now pope Urban the eighth read the book, he developed a sneaking suspicion which might well have been true that Simplicio was meant to be his noble self and Galileo spent the rest of his life under house arrest.

Now that's simplistic too, but it does show that what you were dealing with at that time was an immediate an political and courtly conflict. Now within a generation - though Galileo's books officially remain on the index, the church was perfectly happy with the Copernican system for two obvious reasons.
First hey the Earth does go around the Sun, and not vice versa, and secondly as the Catholic church I think above all the (indistinct) religions, has always understood there's no sense basing a theology on the way the world works, especially when our concept of that is going to change and that's why for example - it's not why they understood - the Catholic position on evolution for the most part has been very positive.

Now again there's a historical glitch because when Darwin published, Pius the ninth, one of the more interesting figures of the nineteenth century history was pope, and although he had started out very liberally minded he had become very embittered and conservative and part of his lands had been taken away by the developing state of Italy, so he didn't like Darwinism and he issued a (indistinct). But Pius the twelfth, again not a favourite character of mine at all deeply conservative reactionary man, even...even he in the (indistinct) of 1950, made it clear that he didn't like evolution, but that he was no going to anathematise it - if that's the way it is - that's the way it is - now John Paul just a couple of years ago was much more positive and because as I understand the Catholic position, it's not my world - is very consonant with the argument that I'm making, that how the factual world is constituted is to be determined by science.

Melvyn Bragg : What would be your comment on that John Haldane?

John Haldane : I think a couple of things. I mean one is that the story of Galileo is interesting for all sorts of reasons. But one is it actually diminishes the difference between older science and science now - which is what Hilary was concerned with earlier on, because in fact what it's a reminder of is that science is always set within a context in which purposes and personalities feature, and it's always had its patrons, and part of that story was a story of conflict of strong personalities. Galileo, you know determined to put himself into his position. Another figure Cardinal Bernamine (?) trying to get him out of it, and giving him every chance and so on - so it's a very complicated case. What I think about the more general lesson about how religion might regard scientific development is this, it has to embed it seems to me - science within a broader account - it can't simply say "well okay, let's partition this, you do your bit, I'll do my bit and then you know we can talk occasionally and so on". The religious ambition is to understand reality in its totality.

Melvyn Bragg : So do you think that science can at any time tell us *all* the material facts about nature?

John Haldane : Well I mean to the extent of course of the limitations of human power and so on, it may tell us all about the material facts, yes.

Melvyn Bragg : And what other facts...?

John Haldane : Well, I wouldn't...

Melvyn Bragg : What other facts?

John Haldane : Well, I mean that's where I...that's where we began with the notion of facts here. I mean if we think for example of something like anthropology..let's move away from say physics and chemistry, let's sort of think about you know the science or sciences of human nature, trying to understand what human beings are. Well that has various aspects, there's physiology - but of course physiology has to be linked up with psychology. Psychology has to be linked up with some story of human beings as artistic creators, as moral agents and so on (see itom78). So just as the different sciences have to be embedded within an ever increasing larger story including a social science, so I'd say all of that has to be embedded within a religious world view. So that's how I see them as related.

Melvyn Bragg : Hilary Rose what do you draw from the Galileo versus Pope Urban and the recent pope's statement accepting evolution by Roman Catholicism?
Is this not an illustration of what Stephen Jay Gould is...?

Hilary Rose : I think it works beautifully, so I want to go round the back and pick up Stephen's point about Monsanto. Because in order for us and I like to word we, in order for us to defeat Monsanto, it meant overthrowing the Judeo - the Christian Judeo belief in the supremacy of man and that everything should be subordinate to man, a belief which has been extremely convenient both for the church....and man I think was a very gendered being in that sense, I don't think it meant universal human beings, I think it did mean "man"and this has been very convenient for scientists, because it has enabled them, particularly as biologists to research on other species, often with considerable violence , and I think the defeat of Monsanto actually reflects a move culturally to establish a different relationship to nature, and one that was not forged either from within you know the general reductionist view of science, nor was it forged from within the Judeo Christian domination of nature thesis. So I think it's something historically new, and that in the defeat of Monsanto - Stephen's example not mine - we're talking about people struggling to develop a new morality in our relationship to nature and I think that's incredibly important. I don't think we owe too much to the church from it, some church people - true - some scientific people -true, but I think it comes from a willingness to try and recreate ethics.

Melvyn Bragg : So you think that the argument has moved on?

Hilary Rose : Mm-hm.

Stephen Jay Gould : With respect to the particular exam I don't see it that way because stopping the research on forcing seeds to be sterile is to me a moral victory, because the only possible rationale is Monsanto making more money. It didn't help farmers it didn't help agriculture, but I'm not opposed *in principle* to the modification of plants in a (indistinct) way that's been official to humans and not hurting anybody, for example the ability to put vitamin A into rice, which can no we done through genetic engineering is going to save hundreds of thousands of children's lives in Asia every year. And that to me is a triumph because of its moral benefits, though the technology is not dissimilar to the Monsanto killer seed case, which to me was using the same technology for immoral purposes which is again why I think the moral questions have to be made separate from the factual ones.

Hilary Rose : But the moral question that...I mean you have delineated a position which I think is quite often articulated but there is actually a huge...there are huge group of people who actually are very very uneasy about the very fast manipulation of nature. And what...how should we do this? I mean *should* we do it? And these questions..I mean as a natural scientist, you don't feel this particular concern, you feel it's okay to do it, and I would say "yes

that's because you're happy with the Christian Judeo tradition". If you're actually part of I think the new Green movement there's a much greater feeling about stewardship, responsibility to nature, a much greater concern, "should we do these things to nature?" and I think that comes out of a different sort of ethic...construction of ethics.

Stephen Jay Gould : Well I think that's a different issue and that position doesn't make any sense to me for another reason. I think what we're up against is an old problem. Any time you develop a powerful technology, it can get you into trouble as well as it can be beneficial . Atomic technology being the obvious prior example, and therefore we have to be very careful about the moral and social uses. But I wouldn't try and invent a different ethic that says we should never in principle manipulate nature, because nature's manipulating itself all the time, bacterial genes pass into other species.

Melvyn Bragg : John Haldane can I come to you? Do you think that this talk of morality and ethics is dependent on religion, that without a religion - you practice Roman Catholicism - without one of the great world religions or a form of religion, there is not the stern morality which enables us to behave in the ways that Stephen Jay Gould's described on the Monsanto issue for instance.

John Haldane : Sure. I think this is a terrifically important and very deep question. It's interesting that Stephen characterises religion whenever he...I mean he has a great deal to say about science, when he turns to talk about religion, by and large religion gets glossed as something like morality, and I'm not suggesting that morality isn't important to religion, but there are other things as well. Now this question...the question you ask about you if you like the old one, "can there be morality without religion? - If you take religion away what would be left?" I think there can be morality without religion, the question's a different one "What morality will there be when you take away the Judeo Christian central concepts?"

You see I'd contest this characterisation of the concerns of science. This idea that what you get out of the Judeo Christian world view is this idea of man as sovereign, manipulating the Earth for his own purposes and so on. What you get out of that tradition are several things, and to some extent they're in conflict. but the notion of stewardship that was mentioned actually originates in the Judeo Christian idea, and all the way through, it's not a modern notion, if you think of somebody like St Francis of Assisi and that concern with nature you know, brother sun, sister moon and so on. That rhetoric if you like, that kind of green ecological concern with creation as something that we have to tend to and be respectful of and so on and that to interfere with it is to "play God". That's precisely a religious notion. So I think I'd want to contest first of all the idea that Christianity is about the bad guy in this. It seems to me it's been both bad and good, there's different voices, and then secondly to go on to say that when we look at religion , in relation to morality the question is not so much "Can there be morality without religion?" but if you take away something like the religious structure, what kind of morality are you left with? And my fear is that this degenerates the contract basically.

Hilary Rose : Well if you're right that would be extraordinarily impoverished. I mean...I don't ... I mean I can't envisage a world which is entirely without religion. As it seems to me to be one of the things that's remarkably persistent. It changes its form, you know and we have different religious groups. It seems to be something which is likely for chunks of any envisageable human society to continue. But that said, I don't think..I mean I think there's a lot of lovely anthropological research. Particularly in the area of the new genetics which interests me enormously , where you can actually see people making very complicated ethical choices, where religion plays an extremely small part in their decision making, and that seems to me something which is new and is interesting.

Melvyn Bragg : Stephen Jay Gould d'you think that science could threaten religion in a way that's not conceived of as it were in your philosophy? That is to say, given John Haldane's Roman Catholicism, he has said, I read this, that were the bounds of Christ to be discovered and proved to be the bounds of Christ then that would severely cast...a most severe....final doubts on your religion. Now that is...let's say that is theoretically possible, so in that sense the science as it were destroying religion in terms of John Haldane's religion is a possibility, what do you say to that, Stephen Jay Gould?

Stephen Jay Gould : See I would say that my characterisation of religion is admittedly and idealised one that is not satisfactory to many people for whom the practice of religion is a very serious one indeed for many millions of people. This is more true in my country than yours, you're in this largely post religious society, let's face it. America which is a completely incomprehensible bizarre nation has this enormous majoritarian claim for important

belief. Now I do acknowledge that for many people who practice religion factual claims that were previously asserted are very important. There are millions of people in America and they're actually a politically powerful lobby which is not true here , for whom religion is the literal reading of the book of Genesis, whatever that means, but in any event they believe the Earth's 10, 000 years old and that God created life in 6 days, with 24 hours each and that's a factual claim, that happens to be wrong, so for them, their concept of religion is intimately embedded within a whole set of factual claims that are false, and science can show to be false, but again I think that's - I don't mean to be arrogant about it - but I think that's a misconstruction of the aims and meaning of religion and science cannot conflict with the better construction of religion which is indeed, it's not only morality, because atheists can be highly moral people, I trust - I am myself!

Melvyn Bragg : Well I would just like to take on a point that was made earlier that - and you make it yourself in this book very clearly - you say look, I'm a scientist, and my views of science are clear and a protagonist fro science, and my heroes are Darwin and so on, and therefore when I'm talking about religion I'm suspect on this, I'm going to try and tell you why I am suspect and what my position is on this. So can you develop the sentence that you put in the book that "science cannot offer anything to say about the morality of morals" for instance. You're defining what you see, but I'd juts like a hardening up of the majesterium of religion, from your point of view.

Stephen Jay Gould : I agree with Dr Haldane that I sleight it because its not a world I know, as well as the world of science, but I never meant to say that it's simply a study of morality. It's a consideration of all questions about meaning in that spiritual sense. We do need to struggle with why we're here, and factual science is not going to help us, the moral dimensions of that, and traditionally those kinds of discussions have gone on in the majesterium of religion, and look, facts are relevant - that is it is important to understand that the Earth is billions of years old, that the human body evolved in the material sense, in a contingent world where it didn't have to be that way, **where there are not vectors of progress leading inevitably to us** , that's an important factual basis, but it doesn't enjoin any particular moral decisions. Science cannot go beyond what I might call the anthropology of morals, that is science can study the different belief systems throughout the world, and they may find common features and you can even argue perhaps that some of those common features are there for good Darwinian reasons, that's never going to help you with the moral questions.
Just suppose you discovered for example the vast majority of human societies that it's okay under a certain set of circumstances to kill others, that doesn't mean it is right. It may have been a useful behaviour when we were stone wielding small groups of hunter gatherer peoples, so the fact that there might be an anthropology of morals is only a factual gathering of information to decide whether we ought to be behaving that way requires a different kind of discussion.

Melvyn Bragg : John Haldane?

John Haldane : I think I'd like to make the challenge from the side of religion a bit tougher because it seems to me you provide relatively easy cases. The strategy is this, it's to show that science and religion are not in conflict, and then somebody says, "but that can't be right can it? let's have a look at what religious believers say". Then the examples we get are say these ones of creation fundamentalists, to which the response is "well of course what they say is both false and silly" and of course many religious believers will cheer along with that. What I think one needs to look at are the tougher cases from your point of view, because look, religious...among the things that religious believers typically believe in - and I don't mean those sort of fundamentalist believers - are things like the power of petitionary prayer. The idea that you know, speaking to God engaging God in prayer can make a difference to the way the world operates. Another thing they believe in are miracles, a third thing that they tend to believe in is some kind of sacred history, that if you look at the narrative of history, or human time and so on, that the way the world has gone, that it wouldn't have gone if there weren't a providence in the back ground, and so on.

And then if you turn to Christianity a fourth thing that they believe is the incarnation, the idea that God entered into the material universe. Now I suppose there's a question, but I think I can guess at the answer. My suspicion is that when those come on to the scene, it's not going to be so easy for you to suggest a reconciliation, because it does seem to me that these are going to start to be counter explanatory claims perhaps.

Stephen Jay Gould : But at that point I just very (indistinct) and say "alright I don't happen to believe in the immaculate conception of Mary for example", but that's not a scientific question I will leave that to you, to debate whether or not Mary was conceived without sin and free of the taint of Adam, because that's not a question that

science can adjudicate in any case. The Catholic church debated it for a couple of thousand years, my guy Pianono I talked about before...

John Haldane : But that was my example....

Stephen Jay Gould : ...proclaimed it, and fine. But I think that way about the phenomenon of miracles that is I cannot say as a scientist, that miracles defined technically as suspensions of natural law for a moment don't happen. I suspect they don't, but if they did, I couldn't study them anyway, so I'm going to leave that domain aside. They don't seem to make much of an impact on human history anyway.

Hilary Rose : And prayer?

Stephen Jay Gould : Prayer is the placebo effect, that's one of the most powerful (John laughs) ones we know. I have no doubt that prayer is immensely beneficial for many people, it don't think it changes the character of the world, that can be scientifically adjudicated. But again I would say, for those for whom it is necessary to think that it does, it's outside the realm of science, I'll let them be.

Hilary Rose : Stephen, didn't Galton actually measure the power of prayer

Stephen Jay Gould : Oh many people have tried ...

Hilary Rose : ..and he actually came to the conclusion that it didn't work. It's one of his more delicious experiments, yes.

Stephen Jay Gould : ...of course many...yes, you study...since what he did was to assume since kings are prayed for more often than ordinary folks, if it works, kings ought to live...then I'm not simplifying ...and they don't!

Melvyn Bragg : But let's get back to the domain of religion Hilary. You said that for chunks...you used the word chunks of the future, there would be a religious component of human nature, you thought it had been around, and you would worry if morality disappeared, now I think...I mean people will say, where are the pillars for morality, where's the instructions for morality, where's it coming from? One of the passages in Stephen Jay Gould's book that I particularly like was his description, it's a strange word given how moving it was, was Huxley's reaction to death of his son, and his discovering or rediscovering or asserting morality in the face of Christian consequences of that as it were. Now where do..where will you plant your morality as an atheist although you think even an atheist is too strong a word your an "indifferent" really to God aren't you?

Hilary Rose : Yes, I mean as far as I'm concerned, you know, it's impossible to consider any circumstances under which I could believe in the power of prayer, or any...

Melvyn Bragg : Yeah but the power of...

Hilary Rose : ...or any of these other..I mean or gods or any of these things, they just seem..

Melvyn Bragg : It makes it easy these measurements...but I actually think that Stephen Jay Gould's idea about placebo effect, which we know is tremendously powerful. Experiment after experiment...

Hilary Rose : Oh yes!

Melvyn Bragg : If Galton had done the placebo effect instead of prayer, he'd have been very surprised indeed about the effect it can have, as we know, in the most extraordinary cases.

Hilary Rose : Oh yes.

Melvyn Bragg : Put that aside. What's your morality going to be based on/ Or need it be based on nothing or what do we do about it?

Hilary Rose : No, my morality will be based on people's relationships with one another and how they think about one another. So mine will be...

Melvyn Bragg : But will they think about one another like Pol Pot thought about one another? Who's thinking about one another where?

Hilary Rose : ... a morality from below.

Melvyn Bragg : Who's thinking about one another where?

Hilary Rose : No, no I don't think Pol Pot was thinking too much about one another. I think Pol Pot was thinking very substantially about Pol Pot. I see ethics as connected to politics but not actually equitable with them, and if you're going to discuss Pol Pot in a useful way you've got to enter into the realm of politics. But ethics which, you know, I see as having, you know, a less...somehow in a sense a both broader and a much smaller agenda, in that discussions of the polis fit in between very big ethical statements and very grounded ones. I'm interested in very grounded ethics, of how we live our lives in a day to day way, and I see those as coming out of our lives and that we're passing through a new sort of post religious period, particularly in Britain.

Melvyn Bragg : I'm sorry to hang on to Pol Pot, but I'm going to.

Hilary Rose : Right. We're going to talk politics then.

Melvyn Bragg : The fact is that...no we're not talking politics, we're talking morality, we're talking Thomas Hobbes life is nasty brutish and short, now that seems to me to be ethics as much as...every bit as much as any political dimension. I'm just asking if ....religion says, for better and for worse, and has done, you behave like this, you act like this, now then without religions, I'm asking you, who is saying that, are we saying it to each other? And I'm choosing the example of people who choose *not* to say it to each other, who choose to behave in a way totally differently from that which you would approve, which all of us would approve, so I'm just saying where's the basis for this? Is there one? Maybe there needn't be one I don't know.

Hilary Rose : Well, you always have to consider power, and Pol Pot had was power. I mean the British used to talk about "we have the Gattling gun, and you have not" and that's after all part of the history of the church. Sometimes the spiritual church was very very closely allied with huge secular power and typically in those circumstances, things got a bit dodgy, unethical rather frequently.

John Haldane : I think that...the question that was asked about what can be the basis of morality seems to me a tremendously important one, and not juts in this kind of intellectual debate, but for our future how policy is going to be shaped and so on. I think that unless one has more than the notion of fair dealing, then morality will degenerate down into a kind of contract with one another. Now what can the "more" be? Well it seems to me an ennobling self conception is what's called for. An account of what it is to be a human and to live a good human life, that's what is required, if we're going to raise ourselves above the kind of situation which was at some stage we would fall into.

Now that notion of an ennobling self conception is one that religion has provided, but not religion uniquely, but I do think that it gives it a certain form, because it has built into it the idea of transcendence, and the idea of completion, and it's very difficult to see how there could be any secular counterpart of those, and without that ennobling self conception then I think we are left with that question hanging "What future has mankind without religion?".

Melvyn Bragg : Stephen Jay Gould?

Stephen Jay Gould : It won't be a secular counterpart to that in one sense, but you don't need belief in a conventional supreme being to have it either. There's a moral dimension in all human lives. I'm afraid we have to bite the bullet and allow that there simply is not a way in which we can agree upon an external and universal basis of ethical behaviour , it's just the nature of the enterprise. Indeed the religions don't agree among themselves , so there's not going to be answers there either. I take refuge in something David Hume said a long time ago, when he was examining the same question and coming and coming to that reluctant conclusion there can't be a logical universal basis for ethics, namely luckily thank goodness, there seems to be what one might call a moral sense, just

as we have other senses. There is a consensus that we can reach. And....

Melvyn Bragg : But looking at the history of the 20th century....

Stephen Jay Gould : ..it preserves us..it's a consensus that's probably simply based on what you need to believe, like the Golden Rule in order to still be here. So when the Pol Pots in the world emerge you're not going to convince them logically you going to have to convince them by struggle. That's why we have penal systems, that's why we still fight wars for all their tragedies.

Melvyn Bragg : Would you agree with that Hilary Rose?

Hilary Rose : Yeah I would, but I mean in a sense, I would also see against what John was arguing, that you could only get these ethical accounts and you know an alternative of a different kind of human being. I mean socialism and Marxism particularly had a very strong belief in and a different view of human nature (see iotm78). You read the early Marx, there's this sort of beautiful account of how under certain social conditions we will have beautiful new human natures, and this was a compelling vision, you know, which some of us have subscribed to very dearly, and this was an alternative view of how we became good people. I mean totally in contradiction to Hobbes, and this was a compelling vision for a great part of the back end of the 19th, great chunks of the 20th century. It ended in many ways, as gruesomely as various of the religion....I mean it would appear that when political theory gets too close to the state it becomes rather unfortunate, the same as when religion gets too close to the state it becomes rather unfortunate.

Melvyn Bragg : John Haldane.

John Haldane : Well Marx's vision was of course partly a religiously inspired one. I mean what Marx is doing in a sense is taking the Jewish notion of a sacred history and the idea of a purpose on point in the evolution of events and casting that in a secular idiom. Dialectical materialism takes over dialectic of spirit. But you might say that as it were it's fate was a result of its hubris, that it tried to substitute precisely because it tried to substitute for religion, to give a secular equivalent of that transcendent aspiration - it failed, and that whenever human beings try to do that, they'll end up in the same position face down in the mud. (Stephen giggles)

Melvyn Bragg : Can I conclude what for me has been an absorbing discussion by asking Stephen Jay Gould, d'you think it's the same impulse that drives physicists to complete string theory as drives theologians to prove the existence of God?

Stephen Jay Gould : In some very broad sense I suspect it is. We're such a crazy curious species, that's why we're so (indistinct) to do the mostly terrible things to each other, and yet there is this substrate that one can only deem admirable. We are, as Sarvay(?) puts it this little creature, wondering why in the vastness of the heavens we're here and what it's all about and we've got this damnedest desire to find out. Science is a way of finding out in a factual sense. What religion seeks may not be factually resolvable, but it's a similar set of questions. "Why are we here? What's it all about? What can we do? How can we make it better?" that is the most noble part of our nature, and I think we should do everything we can to nurture it, because there's some very ignoble parts as well.

Melvyn Bragg : Hilary Rose, Stephen Jay Gould and John Haldane thank you very much. Next week as part of the Victoria season, I'll be discussing the British Empire and its effect on knowledge with Richard Drayton, Azir Sardar (?) and Marianne Misrar (?). Thanks for listening.