

Science/Religion

(A talk given at King Edward VI Camp Hill School, Birmingham, March 2002)

Science and Religion. First, there is no such thing as Science - but there are many sciences investigating different parts and aspects of the universe. (I am restricting attention here to the physical sciences as distinguished from psychology and the social sciences.) All of these are legitimate, valuable, fascinating, indispensable, worthy of a lifetime's efforts. None of them is in itself either pro- or anti-religion.

However there is a philosophy which a large majority of those working in the physical sciences today take for granted. This was once called materialism. But that is not a good word for it because of its association with materialism in the sense of being materialistic, concerned only with material possessions rather than moral and cultural values, and there is no reason why those who hold this philosophy should be any more materialistic in that sense than anyone else. The accepted terms today are 'naturalism' and 'physicalism', meaning the belief that the physical universe constitutes the totality of reality. On this view there is nothing beyond the physical, no trans- or meta- or supra-physical or suprasensory reality such as the religions affirm. And so the entirety of reality is, at least in principle, fully describable and understandable by the empirical sciences. This is so widely taken for granted today that it is often equated with Science or with the scientific point of view. But I am going to argue that on the contrary naturalism is not 'scientific truth' but a philosophy which most but by no means all scientists hold; and that it is, when ardently believed, or unquestioningly taken for granted, a faith position - as much so as religious faith.

To show this in short space I want to concentrate on the fact that the physical universe includes human bodies, and thus human brains, these being the particular bits of the physical universe that I want to focus on. Here naturalism, or physicalism, is so fully taken for granted today that, for example, the excellent account of the brain by Rita Carter (advised by Professor Christopher Frith) is not called Mapping the Brain but Mapping the Mind. However I shall argue that at this point physicalism becomes self-contradictory, so that the physicalist has to retreat - or rather, I would say, has to advance - to a more open position which accepts that there may possibly be suprasensory realities such as the religions speak of.

But first let me clarify. Surely, you may say, any physical scientist would grant that consciousness and thought exist and that these are not physical objects. Consciousness may be ephemeral, its contents in constant flux, with thoughts coming and going all the time, but consciousness does exist. This is of course not in dispute. But the question is, What is its status? Different schools of physicalist thought have given different answers, which however boil down to two main options. One is mind/brain identity. This is the view that thought is, purely and simply, the functioning of the brain. Consciousness is neural activity, consisting without remainder in the electro-chemical activity in the brain. Thus a particular episode of conscious thinking, and the specific electro-chemical processes which are taking place in the brain at the same time, are not distinguishable as physical and non-physical but are one and the same physical event.

However this mind/brain identity theory, also known as central-state materialism, is not nearly so widely held today as it was a decade or two ago. Its basic problem is a very obvious one. Suppose a neuro-surgeon has exposed a patient's brain and, with the aid of instruments registering its electrical activity, is tracing the successive co-ordinated firings of the neurons. The patient is conscious, there being no pain nerves in the brain, and she reports what is going on in her mind, the contents of her consciousness. Suppose she is deliberately visualizing a mountain scene with a blue lake in the foreground and pine trees beyond it growing in a green swathe up the lower slopes of a mountain range. Does it really make sense to say that the electro-chemical activity that the surgeon is monitoring with his instruments, taking place in the gray matter that he can see and touch, literally is that visualized mountain scene which forms the content of the patient's consciousness? It makes sense - whether or not it is true - to say that the brain activity causes the conscious experience. It makes sense - again, whether or not it is true - to say that there could be no conscious experience without that brain activity. But does it make sense to say that the brain activity actually is, identically,

that visualized scene occupying the patient's consciousness? That is strongly counter-intuitive, even to the point of being unintelligible.

However this appeal to ordinary experience is dismissed by some neuroscientists as 'folk-psychology'. But that is pejorative spin language. Whilst there is an overwhelming body of evidence for full consciousness/brain correlation, to suppose that any accumulation of this evidence, however great, constitutes evidence for their identity is a simple logical fallacy. Neural activity in my skull, and my conscious mental act of formulating the sentence that I am now uttering, are completely correlated with one another, so that in knowing one it is possible, ideally and in principle, to infer the other. But it does not follow that my conscious subjective mental activity literally is an event in the neurons, synapses and electric charges in my head. That A and B exist in full correlation with each other does not mean that they are identical.

We can summarize thus far by saying that there is no pain in the brain but there is in consciousness. And likewise the range of colours that we see and sounds that we hear and sensations that we feel do not exist in the brain but do exist in our consciousness.

So naturalistic neuroscientists have generally moved to the theory that consciousness is a new emergent feature or aspect of brain activity, an aspect that develops when the brain reaches a certain degree of complexity. It is an epiphenomenon of brain activity, existing only whilst the brain is working. It is totally dependent upon brain function although not actually identical with it, and it has no causal power over the brain. As an analogy, you can think of the way in which an electric current flowing through a light bulb produces light, but as soon as you switch off the electricity there ceases to be any light. As the light in the bulb is not identical with the electricity in the bulb, but is a temporary product of its operation, so consciousness is not identical with the brain but is a temporary product of its operation.

However the data that we have to go on seem to be more complicated than either mind/brain identity or consciousness as an epiphenomenon of brain activity. On the face of it our continuous daily experience is evidence of a two way causation, states of the brain producing states of consciousness, and conscious decisions producing states of the brain which in turn cause bodily behavior.

On the one hand it is a matter of common observation that various drugs change the chemistry of the brain and nervous system, thereby affecting mental life. General anaesthesia causes unconsciousness; alcohol can lower inhibitions and make it unsafe to drive by impairing judgment and releasing aggression; valium can calm stress and anxiety; cannabis can produce a temporary sense of well-being; and the hard drugs can cause hallucinations and all sorts of other extraordinary and sometimes dangerous effects.

And the tremendous and continuing advances in mapping the functions of the different areas of the brain now go far, far beyond these common observations, to a mapping of the different functions of different parts of the brain. But at the same time the neurophysiologists emphasize that the brain functions as a living whole, although within its total activity different areas specialize in different tasks. And they add that far more is still unknown than is known about the brain.

To take a short cut straight to the relevance of all this to religion, some neuro-scientists claim to have located an area in the temporal lobe that produces what they describe as religious experiences. Thus one researcher (Dr Michael Persinger) reports that by stimulating this area, 'Typically people report a presence. One time we had a strobe light going and this individual actually saw Christ in the strobe. [Another] experienced God visiting her. Afterwards we looked at her EEG and there was this classic spike and slow-wave seizure over the temporal lobe at the precise time of the experience'. I'm going to say more about religion later. But let me just say at this point that neuroscientists often have extremely naïve ideas about religion and assume that a bright light, or seeing a vision of a religious figure - whose assumed identity depends on the patient's cultural background, - or feeling at one with the environment, is necessarily a religious experience. When, for example, a certain lesion which disconnects one part of the brain from another can cause a patient to think that he is God, invulnerable to human powers, or when other lesions produce other extraordinary experiences which are structured by religious concepts, they readily assume that religious experience is in general hallucinatory. But within the great religious traditions themselves there is a more sophisticated

attitude to 'mystical' experiences. If you read the great Christian mystics, for instance, you find that they were acutely aware that not all religious visions, auditions, photisms, etc are religiously authentic. Teresa of Avila, for example, as a medieval person, expressed this suspicion as a belief that the devil can cause such experiences. And the criterion for authenticity, in addition to the tradition-specific test of the orthodoxy of the messages received, was always the fruits of the experience in the life of the mystic. If it made him or her a manifestly better person, it was genuine; if not, not. And this is the main criterion across all the great traditions.

So the possibility of inducing by drugs or surgical interventions in the brain, visions, auditions, etc that are religious in the sense that they are formed by religious images and concepts, does not show that mystical awareness in general is delusory. A mind dominated by the naturalistic assumption automatically jumps to that conclusion, but it is not a valid inference. In the light of modern neuroscience we should confidently expect there to be states of the brain correlated with awareness of the Transcendent. This is no more surprising than in the case of our awareness of everything else. And likewise it should not be surprising that there can be false perceptions in religious-seeming awareness as there can in ordinary awareness. A blow on the head may make you see stars which are not physically there, and various drugs can induce much more complex hallucinations, but this does not show that there is no physical world that can also be perceived more or less correctly. Nor does the fact that some drugs can produce religious-seeming hallucinations show that there is no transcendent reality of which there may also be genuine forms of awareness.

So in short, there is massive evidence of altered brain states causing altered states of consciousness. But on the other hand it is equally a matter of first-hand observation that we can consciously decide to move our finger or to utter certain words, and it is prima facie evident that this mental volition produces brain activity which causes the moving of the finger or the production of the words; and again it is prima facie evident that we can consciously imagine a certain scene or consider an argument or a theory and freely make judgments about it - indeed this is what we are all doing, or at least think that we are doing, at the present moment. Thus it is prima facie evident that when we exercise our free will in mental or physical action the state of the brain is correspondingly altered.

This brings us to the internal contradiction within the naturalistic assumption as it shows in the brain/consciousness relationship. The sciences proceed on the basis that the physical world functions always and everywhere in accordance with the regularities and patterns that we call the laws of nature. And universal law entails universal causation. In other words, events do not occur at random but are always caused to happen, and the causation is always law governed.

There is however a complication to this picture in the principle of indeterminacy or uncertainty in the behavior of the most fundamental particles. According to quantum mechanics, at the minutest subatomic level it is in principle impossible to measure precisely both position and velocity at the same time. There is thus an element of uncertainty or unpredictability at the heart of nature. It seems clear, however, that this micro indeterminacy so to speak cancels out at the macro level of objects consisting of trillions of sub-atomic particles. It does not create an indeterminacy in the world of humanly observable physical objects and processes.

However I am not going to insist on this here because it does not in the end affect either way the question of human free will, which is the issue towards which we are moving. For we are no more free if our thoughts and actions are randomly determined than if they are rigidly determined. Either way they are not freely determined by us. Given either strict determinism, or an indeterminacy due to subatomic unpredictability, human freewill would be excluded.

So we come now to the basic issue that has been hovering all the time in the background, the question of intellectual freedom and determinism. This is seldom discussed by neuroscientists. Rita Carter, however, expounding what she takes to be the outcome of their work, says, 'some illusions are programmed so firmly into our brains that the mere knowledge that they are false does not stop us from seeing them. Free will is one such illusion. . . [But] Future generations will take for granted that we are programmable machines just as we take for granted the fact that the earth is round'. What she has not noticed however is that she is tacitly exempting her own thought processes from the scope of her dogma. But if we apply her conclusion to her own thought processes in coming to

that conclusion, its status is dramatically altered.

The point was forcefully made by the great philosopher of science Karl Popper . But it goes back to Epicurus, who said, 'He who says that all things happen of necessity cannot criticize another who says that not all things happen of necessity. For he has to admit that the assertion also happens of necessity'. This seems to me to be basically right, although it needs to be developed a bit further. Let me put it in my own way.

Let us suppose that the physical world is completely determined, at least at the macro level which includes our bodies and of course our brains. And suppose that, as will then be the case, some of us are causally determined in such a way that we believe that complete determinism obtains whilst others are causally determined in such a way that we believe the contrary. The question is whether those who are right in believing that they are totally determined can properly be said to know that they are right, or whether on the contrary if they are right they can never properly be said to know or rationally believe this, or indeed anything else?

To get at this question, suppose there is a non-determined observer watching our totally determined world from outside it. This observer is able to think freely, to direct her attention at will, to weigh up evidence and consider reasons, and out of all this to form her own judgments. She can see that our world is a completely determined system and that everyone in it is completely determined in all their actions, thoughts, imaginings, feelings, emotions, day dreamings, visualizings, and all their reasoning, judging and believing. But whilst this undetermined observer knows that we earthlings are all completely determined she knows it in a sense of 'know' in which even those earthlings who correctly believe it nevertheless do not know it. I am not here invoking an ideal sense of 'know' in which it turns out that we can only be said to know tautologies, but am using the term in the everyday sense of knowledge as well-based rational belief. Thus if there is or could be free will including, crucially, non-determined intellectual volitions, a free being can come rationally to hold beliefs in a sense in which a totally determined being never can. Let us for convenience call the free being's knowledge knowledge A and the determined being's knowledge B, and speak of them as functioning respectively in mode A and mode B.

Given this terminology, I suggest that those who believe that a total determinism obtains, and who of course believe that they are right in so believing, are in the impossible position of implicitly professing to function in mode A when, if they are right, they must in fact be functioning in mode B, the determined mode. This, I suggest, is a self-refuting position in the existential sense incurred, for example, by someone who says, 'I do not exist'; for in order for anyone to assert that he does not exist, what he asserts must be false. Likewise, to assert in mode A - that is, as an evidence and reason based judgment, - that all judgments including this one can only be made in the physically determined mode B, is to be in a state of existential self-contradiction.

In other words, the argument between the determinist and the non-determinist can only take place in what both assume to be mode A. But whereas the non-determinist believes that what they are both assuming is true, the determinist believes that it is false, and is thus claiming to know in mode A that there is no mode A.

This is the self-contradiction at the heart of physicalism.

However an escape route from this intellectually intolerable position has been suggested. A computer can be programmed to go through an accurate deductive process and reach the correct conclusion. And what could be more rational than the logical process pursued by a computer? May not our brains be biological computers able to function in this way? This is in effect what the determinist believes to be going on in the discussions about determinism. We are totally determined, but the determinist may nevertheless be determined in such a way that he arrives at a true conclusion, just as a computer may.

The right response to this is, I think, that Yes we may be totally determined, in which case the determinist is determined in such a way that what he believes is true. But if so, none of us can ever know or rationally believe that this is the case. Two people debating the question would be like two computers purring away in accordance with their different programs, with only an outside observer operating in mode A being able to tell which is and which is not programmed to arrive at the truth. In

the case of computers, the mode A outside observer is the programmer, who has to know what sound reasoning is in order to program a computer to reach it. Or of course if the computer is built and programmed by a prior computer, the mode A observer is the non-determined programmer of that computer; and so on in as long a regress as you like. And likewise with ourselves considered as fully determined computers. If anyone is to know what is true and what is false among the conclusions which differently programmed human computers reach, that cannot be any of us in mode B but could only be a non-determined mode A programmer.

But now another suggestion offers itself. Perhaps the ultimate programmer is nature itself. For true beliefs aid survival. May not the evolutionary pressures of the environment gradually eliminate poorly programmed brains whilst rewarding correctly programmed ones, thus moving the whole development in a truth finding direction? On this theory there is no mode A consciousness, but nevertheless the whole process whereby our brains have become as efficient as they are is a purely natural phenomenon.

But problems at once arise. The most fundamental one is that if this theory is true we could never know or believe this in mode A, since all believing would be in mode B. But further, why would a truth-seeking machine arrive at the species-wide delusion that it is not determined? Presumably because the delusion has survival value. But how could a deluded consciousness possibly have survival value if we are simply totally determined bio-computers? Being determined, we do what we are caused to do, and consciousness, whether deluded or not, adds nothing. Against this, it could be said that biological evolution, in its continual experimentation, has sometimes produced non-functional by-products, and perhaps consciousness, with its sense of mental freedom, is one of these. But this 'perhaps' is dwarfed by a massive 'perhaps not', for generally the evolutionary process has aided efficient function, and unless there are positive reasons to the contrary the presumption must lie with this.

And so it seems to me that in affirming the freedom of his or her own reasoning faculty the naturalist must move to a more open point of view. If our mental life is not purely electro-chemical neural activity, it follows that there is non-physical as well as physical reality. It further follows that this non-physical reality is not a mere epiphenomenon of matter but is able to exert causal power upon one part of the material universe, namely the human brain. A door has thus opened to the possibility that the human person is more than a purely physical organism, and also that there may be a suprasensory reality such as the religions point to, and a non-determined capacity of our own nature to respond to it. A door of possibility has opened. The naturalist may resolutely refuse to go through that door, or may simply turn her back on it and ignore it, but nevertheless the door stands open.

So what I have been arguing - and this is my main contribution today to your science/religion discussions - is that the naturalistic assumption that the totality of reality consists of physical matter and that there is therefore no suprasensory reality is not a defensible position.

What may lie on the other side of that open door? Both religious believers and non-believers usually think of religion only in terms of the religious tradition with which they are familiar, which is the one into which we were born and by which we have been formed. But this is too narrow a focus. The central feature of religion in virtually all its forms, both theistic and non-theistic, is the belief in a reality that transcends the physical universe but is accessible to the spiritual aspect of our own human nature, the aspect that is spoken about in various ways, such as the image of God within us, or the atman, or the universal Buddha nature. For our present purpose I am going to call that reality simply the Transcendent or the Real. I am using this because our more familiar word 'God' can so easily bring with it connotations which I want to avoid. It is often taken to mean an infinitely powerful Being who sometimes intervenes miraculously on earth in response to human prayers, as is of course described at many points in the Bible - as one obvious example, making the sun stand still for twenty-four hours so that the Israelites could have longer to slay their opponents. But if there were an all-powerful intervening Being like that, I wouldn't think him (or her) worthy of worship. That's for a very simple reason. Suppose there's a car crash in the road outside and three of the people in it are killed but one survives more or less unhurt. If that one, believing in a miraculously intervening deity, then thanks God for saving her life, she's forgetting that if God decided to save her, he must have decided at the same time not to save the other three. But if he could if he wanted equally easily save everyone from all harm, why is there so much pain and suffering in the world? This would be a

cruelly arbitrary God, and the only people who could reasonably worship him would be the chosen few whom he protects.

Focussing, then, not on God in that sense but upon what I shall call the ultimate transcendent reality, or the Transcendent for short, to which the religions are our range of human responses, why believe that there is any such reality?

Here we have to distinguish between what we can call first-hand and second-hand religion. Believers at second-hand include the multitudes within each tradition who simply believe what they have been brought up to believe, so that if they had happened to have been born in another part of the world they would instead have believed what people there are brought up to believe - though the believer at second-hand may sometimes nevertheless have a genuine and lively faith derived from the much greater spiritual figures whose religion is first-hand, based on their own experience. The greatest of these are the founding figures of the various religious traditions - in historical order, the Upanishadic sages, the Buddha, Lao-Tze (or whoever wrote the Tao Te Ching), Moses and the other great Hebrew prophets, Jesus, St Paul, Muhammad, Guru Nanak, and so on, and then the saints or mahatmas ('great souls') who have renewed or reformed the traditions, and also in varying degrees innumerable more ordinary believers who participate at least sometimes and to some extent in first-hand religious experience.

Naturalistic thinkers often assume that religious belief arises as an attempt to explain the world - thunder storms are due to the anger of the gods, for example, - or by an inference from the world to God, the order of the world or the 'fine-tuning' of cosmic evolution, for example, being taken as proof of a creator. But none of this is the real basis of religious faith. The most basic way in which we know that anything exists is not as an inference from evidence but by that which exists impacting us, in other words by our experiencing it. When I hold up my hand and look at it I don't infer that there is a hand there, I see the hand. As David Hume showed long ago, we don't believe in the world around us on the basis of an argument from there seeming to be a world to the conclusion that there is a world. And this is just as well, because no such argument would be valid. You can't in fact prove that anything exists outside your own consciousness. What we all do is simply trust our experience. We are all first-hand believers in the existence of a world beyond our own minds. If we didn't trust our experience of seeing a brick wall, or an oncoming bus that will run us over if we don't jump out of its way, the world would soon eliminate us. It is the nature of rationality to trust our experience, except when we have a specific reason to think that an apparent perception is really an hallucination. So our material environment forces itself upon our attention. We trust our experience on pain of death.

Now the material world, in itself, is value-free. It is just 'brute fact', and whilst it determines our range of possible actions, to be forced to be aware of it does not undermine our inner moral and spiritual freedom within the given physical world. But suppose that as well as living in this physical environment we also at the same time live within a non-physical supranatural environment which does not force itself upon us, but awareness of which is a free response made possible by the spiritual aspect of our nature. It does not force itself upon us because to become aware of it involves a shift from natural self-centeredness to a new centring in the Transcendent, beginning to liberate within us our capacity for unrestricted love and compassion, and this is a shift or a transformation which can only be entered upon freely. By its very nature it cannot be forced, as can awareness of the value-free material world.

But there is another obvious difference between sense experience and religious experience, namely that whereas all human beings perceive the physical world, and perceive it in (almost) the same way, religious experience is not universal and when it occurs it takes a wide variety of different forms within the different traditions that have developed. How can this be? The answer lies in a principle, known to today as critical realism, the view that there is a reality outside us but that we can only know it in the ways that our own cognitive equipment and conceptual systems make possible. It is the principle that Thomas Aquinas stated long ago when he said that 'Things known are in the knower according to the mode of the knower'. And in religion the mode of the knower differs among the different ways of being human that are the great cultures of the earth - hence the fact of a number of different religions. They are different because of their different historical origins and because they involve different ways of conceiving, and therefore different ways of experiencing, and therefore different ways of responding in life to the Transcendent. And not everyone participates in any of

them, for a response to them is not compelled. This is of course a huge topic of which I have only been able to sketch the outline for our present purpose. There is a great deal more that can be said but there is no time to say it now.

The kinds of experience I am talking about are not primarily the seeing of visions and hearing of voices or the dramatically altered states of consciousness reported by the mystics, but quite common experiences such as being conscious in prayer, whether in church or elsewhere, of being in the presence of God, or the experience, in say Buddhist meditation, of being in a universe which is fundamentally benign and such that there can ultimately be nothing to fear or to worry about.

So to summarize, we cannot prove that there is an ultimate transcendent reality to which the religions are human, all-too-human responses. But the inner contradiction of physicalism shows that this cannot be ruled out. And whilst those who do not participate at all in the field of religious experience can properly be agnostic about the Transcendent, those of us who do in some degree experience religiously are fully entitled as rational beings to trust that experience and to build our beliefs and our lives on that basis. Religious belief and naturalistic belief are equally faith positions, and each involves risk - in the one case the risk that we are deceiving ourselves, and in the other case the risk that we are being blind to the most important reality of all.

© John Hick, 2002