Musing...

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On mind

The very fact that we think means that there is something very strange about the world, especially if we hold it to be made entirely of matter. But we do not even have to go so far as the existence of an external world to start running into problems - as soon as we have Descartes' *"cogito ergo sum"*, we are already beginning to enter into a world of uncertainty. Each of the three words in that apparently simple sentence contains such ambiguity, when we look into the matter further, that they provide enough material for a lifetime of deep thought, without necessarily producing any answers. *Cogito: I* think - but what exactly is thought? Ergo: therefore - and we run into the nature of logical implication. *Sum*: I am - the conclusion of the sentence, that we exist, raises the matter of what it means when we say something exists, and what distinguishes it from non-existence.

To start with the nature of thought. The reason why it is confusing to say that "we think" is that the concept of thought is already, to some extent, dependent on the rest of the sentence. After all, when we think, we tend to assume that there is some logic behind our thoughts; and when we say that **we** think we are already beginning to assume our existence. But thought need not necessarily be logical; and to assume our conclusion puts us on very shaky ground.

Thought can be a very complex process. Even in the minds of mathematicians and logicians, it does not consciously flow from one proposition directly to the next in an orderly fashion: there are intuitive jumps that occur without our fully understanding why. When one is trying to prove a mathematical theorem, halfway along the way we may suddenly realise what we must prove as an intermediate step, even though we do not know either how to get to that step or how to get from that step to the conclusion. Sometimes the logic comes after the thought. There are also modes of thinking for which logic is not even relevant. When we look at a painting, or listen to a piece of music, our thoughts cannot really be said to correspond to any abstracted series of propositions isolable from the conscious structure of the thoughts. Red is red- C# is C#; *Les Demoiselles d'Avignon* is a picture; Beethoven's Ninth is a series of sounds. In these examples we see that even 'higher' forms of thought - those which are not 'purely emotional' - need not rely on any logical system whatsoever. Thought is not necessarily logical even where we think it should be - for example, in Philosophy. We might feel inclined to side with Plato one day, with Heidegger the next, with Kant the day after that, and then go back to Plato without necessarily having 'perfectly logical reasons' (in the mathematical sense) to do so.

These ideas, particularly the last one, would probably have upset Descartes. They conflict with his view that the human mind was capable of

deciding truths about the world, of knowing what the world was like and knowing this with some degree of certainty. But would they necessarily have conflicted with his mind/body dualism? Not necessarily. Even if the mind is incredibly complicated and confusing to itself, it may still be incorporeal. However, this picture of the mind does agree much better with the materialist's description of the world than the picture Descartes was using. If the mind is an essentially logical creation it is difficult to see how it could arise from billions of neurones all interacting with each other in a brain divided into many sections, each of which, to a large extent, does its own thing. But the more complex, more divided, less clear-cut view of the mind fits quite well with this picture. We have not yet proved materialism to be correct, but we have shown it to be more self-consistent than it may have seemed.

Now we come to the real problems of dualism, which have to do with the interaction between mind and brain. There is the traditional 'problem of interaction', that of how non-material bodies and material bodies can interact, but let us simply accept that there is no inherent contradiction here (although we might wonder, if there is free interaction between mind and matter, why we say that mind is something fundamentally different from matter in a more profound way than, say, electrons are different from quarks). We come to greater problems when we try to consider what these interactions are like. Experiments have been done, in various ways, which show that the relationship between mind and brain must be very close indeed. Substances which affect the brain (both legal and illegal), also have a profound effect on the mind. Electric stimulation of the brain can cause thoughts. If we propose that the brain is simply a funnel through which information pours in from the outside world to a non-material mind, and any change in the brain changed the information passing to the mind, we can get away with a dualistic stance - just. But if the seat of thought is not in the brain but in the non-material mind, and the mind is something which operates independently of the brain, then people should 'think' just as clearly when they are drunk, drugged or whatever. But they do not, as we could at least in principle demonstrate by this experiment.

Suppose that we were to take two identical twins who are very good at carrying out complicated mental operations 'in their heads'. Suppose moreover that these twins had never heard of Fermat's Last Theorem; the reason for their ignorance of this rather well-known theorem is that they were brought up on an isolated farm somewhere in Russia, by a farmer who had an aversion to number theory and would not allow it to be mentioned anywhere near his house. However, our twins are sufficiently intelligent that, given a few hours and without need for pen and paper, they could each independently come up with a proof, which they could then dictate to us from memory. Now, we explain this task to each of the identical twins, and put one in an empty room (being good behavioural scientists, we are aware of the need for a control); the other we put in a room containing several bottles of Vodka. Now the farmer who brought up these twins had an even greater aversion to alcohol than he did to number theory, so of course the twins had never had the chance to sample this particular variety of drink; and, overcome by curiosity, the twin downs the

lot. He realises that the alcohol will effect the brain, but isn't particularly worried, as he thinks his mind can just wander off to work on the problem by itself and ignore what's going on in his body, since the mind, after all, is independent of the body in its workings.

Three hours later, we open both the rooms. The first twin very excitedly explains to us the proof of the theorem, along with all the interesting corollaries in the theory of elliptic curves which he came up with along the way. The second twin is unconscious: when he wakes up, he has a terrible headache, but no more idea of how to prove the theorem than he started off with. So it seems that his mind couldn't separate itself from his body after all. The relationship between mind and brain is so close that it seems to be multiplying entities beyond necessity to make a clear distinction between them.

But if there is this problem with dualism, we must also remember that there is a serious problem with materialism. This is the question of how matter can 'think', one of the most confusing problems of science today. Attempts to find the 'seat of thought' in the brain have proved fruitless - we see many different modules doing their own jobs, but there does not seem to be one which controls them all and receives input from them all - and although there are one or two which come close, people who have lost these seem to function perfectly normally. The brain is a very complex organ, and its science is still young, although the philosophy of mind is almost as old as philosophy itself. We may be reasonably convinced that dualism is wrong, but we have a long way to go before we can decide why materialism is right.

On philosopher kings

Should we try to understand the world, or try to change it? Plato wrote in his *Republic* that his philosopher kings would not willingly take on the task of administering his ideal state, because they would much rather be doing philosophy. They would only perform these tasks because they know that this is a 'good' thing for them to do and that according to Plato's conception of moral philosophy, it is beneficial to oneself to do good things. But if we do not accept Plato's arguments, and would feel much more inclined to sit in an armchair and think about things than actually go out and change the world, then do we too have to choose between thought and action, or can these be somehow reconciled?

According to Aristotle, man is by nature a political animal. But Aristotle himself did not rate political action as the highest purpose on his scale of importance - that, he awarded to philosophy. For philosophy, he argued, even more than politics, is the essential characteristic of man, and hence (according to Aristotle's metaphysical views), his Final Cause, his ultimate purpose in life. But Aristotle accepted that man could not spend his life doing nothing but philosophy, since man is living in the world, a fact which we cannot ignore (as much as Plato would like us to). So both are important. Let us examine some arguments in favour of each.

In favour of the armchair philosopher is the fact that there is an essential

human urge to understand the world, to think about it, and people who do this are already performing an essential role in society by making sure that there are always people who are capable and willing to think critically about the world and its present situation. If everyone is doing things and nobody is thinking, it is very probable that everyone is doing the wrong things. Philosophers and other intellectuals are always near the top of the hit list whenever a dictator comes into power, because these people who think will cause other people to think, and when people start to think, they start to question the moral validity of the dictator's actions. Providing society with a steady stream of clear thought is one perfectly 'useful' function that armchair philosophers serve, provided they get out of their armchair once in a while to look at what is going on and communicate their thoughts to other people. This seems immediately apparent for the moral philosophers at least, since debate about moral and ethical issues is essential in any society, particularly one in which life is changing so fast that new moral and ethical questions come up every day. But what about the others? The ideas of the metaphysicians, the logicians, the philosophers of language, and many others are much less immediately applicable to the everyday world. Does this mean that we must therefore abandon these activities or else resort to an Aristotelian, teleological justification for spending our time in thought? The armchair philosophers can rest easy (they were probably never really very worried in the first place). Even if they are not directly addressing the issues of where our society should be going, what we should be doing, how we should be living, their presence is valuable nonetheless. They remind us constantly that our world view is always questionable, and that we need not necessarily go on thinking as we have done about how the universe is. This is not so much a matter of keeping society running properly ('properly', not 'smoothly' - a philosopher's task is never to grease the wheels), but it is a matter of reminding others of the truth, which may or may not be out there, but is always worth striving towards.

But now for the man of action. We have justified thinkers by saying that they play a useful role in society, by keeping people alert and not letting the slip into error. But simply thinking is not enough. We need people who are both thinkers and doers, people who decide what must be done and do it, who challenge the accepted norm not only in theory but also in practice. Although they will not have as much time to think deeply as our armchair philosophers, the impact they have on society will be much greater. And to a certain extent, our primary responsibility towards our fellow human beings is to make the world a better place for them. In a world where injustice abounds, where money is wasted while people are starving, where wars are being fought, where people are being tortured, simply to stand by is an act of irresponsibility. This is not to say that we all need to go out and place ourselves in front of the harpoons,, so to speak, but we must always remain aware of what is going on in the world around us, and not only be aware but be willing to protest against injustice, to do whatever one reasonably can to right wrongs. We must be thinkers in so far as we must decide what to do, what is right and what is wrong, but we must also be people who are willing to express our thoughts in

action. As the Roman emperor and Stoic philosopher Marcus Aurelius puts it: "Cease arguing about what it is to do good. Go out and do it."

Which of these positions must we ultimately take? Should we devote our lives to thinking critically about the world, becoming a bedrock of rationality on which society can lay its foundations? Or should we go out into the world and express the thoughts we have by our actions, rather than continuing to subject them to reanalysis? Ultimately, the question is about as meaningful as the question of whether it is better to become a heart surgeon or a motor mechanic - both are useful; both, if they do their jobs well, will benefit society. Each person is suited to particular lifestyles, each person must make their own decision. To generalise in these matters is to deny people their individuality even, to some extent, their humanity. After all, a human is not merely a machine which should be put to its most functional use, working towards the greater good of a society of machines. A human is a person with thoughts, feelings, desires; a human's task, in the end, is little more than to be human.

On being critical

It is easy to accept the rhetoric of the open-endedness of science, its refusal to accept authority, its continual criticism of dogma. But when we look at science in practice, we see a picture which differs somewhat from the Popperian view. In society at large statements by 'scientists' are often accepted as truth without any demands to see the evidence - witness the continual stories about how just about everything, by now, has been shown to be 'caused' by one gene or another. Within the scientific community such credulousness is less widespread, but often scientists are less critical than they would like to imagine. Science can be a very emotional activity, and excitement at having new evidence for one's pet theory can overcome one's desire for objectivity. Pet theories aside, how many scientists routinely challenge the assumptions from which they are working - or, if they do, would be brave enough to bring the matter up with their colleagues?

Every discipline has a set of results that were established long ago, and too often these are simply accepted as 'fact' by people working in that discipline. But we have no reason to lose all hope. Science, in practice as in theory, works best when nothing is taken entirely for granted, when there is no particular bias on a experimenter's behalf one way or the other; but this does not mean that a scientist cannot accept, at least provisionally, that certain facts are true. Science requires criticality, but not total scepticism. The fact that science continues to be useful seems to indicate that a healthy balance has been found.

It was Thomas Kuhn, after Popper had first exposed his explanation of scientific methodology, who proposed that science proceeded in a sort of punctuated equilibrium, in which scientists in a ' normal phase' simple used the standard theories of their discipline's 'paradigm' to advance, slowly but productively, the course of human knowledge. Occasionally, however, enough problems would build up in a discipline that a period of 'paradigm shift' would have to occur, in which scientists were uncertain of which theory to adopt, and

several temporary paradigms would coexist until one became dominant. Two prime examples of this came at the beginning of our century, with the advent of Relativity and Quantum Mechanics. The first of these arose from the realisation that two fundamental ideas of physics didn't seem mutually compatible the equivalence of inertial frames and a universal speed of light. The second came from differences between phenomena predicted by classical physics and those observed experimentally - differences which started off as minor discrepancies but gradually assumed great significance. In both these cases, the old paradigm had to be thrown out and replaced, but after this had been done, the scientists, according to Kuhn, essentially returned to the usual practice of advancing science within a paradigm.

Two questions arise from Kuhn's exposition of the processes of science. The first is whether the distinction between normal phases and paradigm shifts is as clear-cut as he makes them seem. The second is, does it matter? Or, more precisely, does this mean that the idea that science is based on critical thought must be wrong?

The first question has had a generally agreed answer in the period since Kuhn's work: the distinction, while not entirely irrelevant, is not entirely valid either. A paradigm is a complex set of ideas, theories, methods, which are generally mutually consistent, but not necessarily mutually interdependent. That is, we can throw out one theory and keep many others. Therefore, small paradigm shifts can occur within the bounds of an otherwise normal phase.

The second question is more important. If science is not generally accompanied by the critical thought that Popper claims, then as a myth it has no special privileges over other myths. But does the acceptance of the paradigm during a normal phase necessarily imply uncriticality? In most cases, not really. The paradigm gained dominance in the first place because there was good evidence for it, and it continues its dominance because there continues to be good evidence for it, and because most scientists, thinking critically, tend to agree that the evidence against it is not fatal. But note that they continue to accept the paradigm even though there is evidence against it - this does go against Popper, in particular against his theory of falsification, that science is essentially based upon a process of finding flaws in a theory, then rejecting that theory and coming up with a new one. This ruthless falsification, however, would never work in practice. To provide an example from contemporary science, we can look at current theories about the workings of the sun. It was discovered fairly recently that there are not enough neutrinos coming out of the sun to match predictions from theoretical data. Popper would have us throw away the theory at this stage, but there are several less dramatic alternatives. Perhaps the number of neutrinos was nearly enough - within an (admittedly quite large) experimental error. Perhaps some other factor is at work: perhaps, as was suggested a few years ago, WIMPS inside the sun are having some sort of effect, or perhaps, as is now more fashionable, neutrino oscillations are preventing their detection. If the theory was rejected immediately it might have robbed us of the opportunity to do a lot of good science while we floundered without a paradigm within which to work. But the important conclusion is, that

when we finally solve the problem, we will do it by thinking critically. If we are eternal sceptics we will never get anywhere, but having just the right amount of scepticism will enable us to reject theories where needed, and retain them where they continue to be useful.

Thus we see that Kuhn's dramatic assertion "There is no Science - there are only sciences" (meaning that since scientists are all working in separate paradigms, it is meaningless to talk about a Scientific Method) is something of an exaggeration. There is a strong tendency to critical thought across everything we do call science, and if that critical thought is not always applied with absolute rigour, it is applied often enough to make science something different from just another myth.