WHAT IS A MIND?

UNIVERSITY OF CAPE TOWN

Week 3 Answer to Question 4

Step 4.2 Ask Mark

Ok, the fourth and final question this week goes as follows:

Question 4: is it known with absolute certainty that the reticular activating system can generate consciousness all by itself, as opposed to being a necessary but not sufficient system for consciousness? I know the studies of children born without a cortex suggest otherwise, but are we absolutely certain in those cases that the apparent emotions aren't simply the mechanical aspects of the emotion and learning behavior, while the actual subjective affect isn't being felt?

Well, that is an impossible question to answer, with reference to the problem of other minds. I've already mentioned that during this course. The problem of other minds, as you know, relates to the fact that you can only ever know your own mind. In other words, the empirical evidence in the sense of directly observable data, directly observable mental data - is there an affect here or isn't there, is there a conscious experience here or isn't there - you can only ever answer it in relation to yourself. Now I know that that sounds absurd - it's philosophy rather than science, and in fact, my answer's going to pivot around exactly that distinction - but philosophers will tell you, with reference to the problem of other minds, you can never know - to quote the questioner - with absolute certainty even whether anybody else is conscious other than yourself.

So there you have your answer already: no, we don't know with absolute certainty that the reticular activating system is both necessary and sufficient for generating consciousness, but nor do we know with absolute certainty that anybody else has a mind other than ourselves. In science we do not deal in absolute certainties, that's the bottom line. Does that mean we throw up our hands, and just become philosophers, or is there something better that we can do? Well, in science, as I say, we don't deal with absolute certainties, what we deal with is provisional knowledge. In other words, the best guess - given all the evidence, what is the most likely the closest approximation to the truth - that we are able to provide, given the evidence at our disposal. The standard practice in this regard is we say: I think it works like this. My hypothesis is that that creature is conscious. Now if I were right, then let me test it. If I'm right, then I make this prediction: that if I were to do such-and-such, then the following consequence will follow. If that consequence does not follow, then my prediction is disconfirmed. If my prediction is

disconfirmed, the hypothesis is abandoned as not being true. If my prediction is confirmed, then it's provisionally held to be true until disconfirmed. In other words we say: until somebody can show some reason to not hold this hypothesis to be true, we are going to hold it to be provisionally true. That's how all science works.

Now the same applies to this question about consciousness. I can't know with absolute certainty whether you are conscious. I really can't. I am - I truly can't. Why do I think you are conscious? Well, it's because I make predictions based on the evidence. When you stick a pin in my finger, I feel pain that makes me withdraw my hand. So if I stick a pin in your finger, and you feel pain, then my prediction is you will withdraw your hand. I can do no more than that. I try it out, I stick a pin in your finger, you do withdraw your hand, I think "well, the hypothesis that he or she is feeling pain is confirmed." That's a very, very simple experiment. I can go further. I can say when I feel pain, there is a part of my brain called the dorsal periaqueductal gray that is activated. That's part of this activating tissue of the upper brain stem. Now I look at your brain, and I stick a pin in your finger. I see that you withdraw your finger, I hypothesize that you're feeling pain. The hypothesis is confirmed by you withdrawing the finger. I hypothesize that you're feeling pain, and that is confirmed also by the fact that the same part of the brain is activated in you as is activated in me when I feel pain.

And that's how we proceed in science. The accumulation of the evidence, the weight of the evidence suggests that the pain is felt by these creatures, because they all behave in the same way, and they have the same anatomy which seems to do the same thing in them as it does in me. But I will never know for sure what their conscious state is. So when we come to these babies that the questioner refers to, they're called hydranencephalic children - they're children who are born with no cortex at all, they only have the brainstem. How do we know whether they're conscious or not? Well it's on the grounds of what I've just said - that they wake up in the morning, they go to sleep at night. When they wake up in the morning, we assume they're conscious. How do we know whether they're conscious or not? Well when they have absence seizures - which are seizures which are defined by loss of consciousness - they lose consciousness. When they have those seizures, they go blank, just as somebody with cortex would go blank when they have an absence seizure. More than that, we tickle them, and they laugh, and they smile, and they gurgle. So we think well, they seem to have, you know, that sensory affect. When we give them a fright, they go "Whah!" and they look upset, and they cry, etc. etc. All of this is the weight of evidence, all of these are confirmations of predictions that they behave in the way that we predict they would, if they had affective consciousness. It does not prove absolutely - with certainty as the questioner requests - that they do have consciousness.

So I grant you that it may be that the upper brain stem is not necessary and sufficient for consciousness, but all the evidence suggests that it is. And that evidence is no weaker than the

evidence that you are conscious. As far as I'm concerned, the only reason I believe you are conscious is because you behave as if you are. All your behaviors are consistent with my hypothesis that you're conscious, and therefore there is no reason to believe otherwise. The same applies to children without cortex - there's no evidence to suggest that they're not conscious. All of the evidence suggests that they are conscious. That's not absolute certainty, but it is science. Okay. Thank you. That's it for this week. See you next week. Bye bye.