Prof. Russell Stannard: The questions on everyone's minds
Consciousness and the Limits of Science

Russell:
What do we know about the human brain and consciousness? Or to put it another way, what can a brain know about itself? Well, we know it's a configuration of atoms and molecules... chemical flows... electrical currents. Some liken it to this, an elaborate computer. But unlike this ... or any other computer that's been built so far, the brain is conscious - it's aware of itself. All that physical activity is accompanied by feelings and emotions. This was an early attempt to try to associate different parts of the brain with different mental experiences. Nowadays we have brain scans. This shows a person when they are meditating and when they are not meditating. But which is which? Which one shows the person meditating? We can't tell - not from just looking at these scans.Not until a subject tells us that that is what they're doing, they're meditating. OK, once they've done that, when we come across the same sort of brain pattern again – in someone else say – it's a good bet that it will be accompanied by the same sort of mental experience again. But without a subject volunteering the information about the mental experience in the first place, we'd get nowhere.
In fact, why are there conscious mental experiences at all? We don't even know which things are conscious. I'm conscious. I know that from direct experience. You? Well, you have a brain like mine and you talk about having mental experiences so okay I'll give you the benefit of the doubt. How about this? Well not exactly this, but you know a proper chimpanzee. Are chimpanzees conscious? Are they aware of themselves? Well yes. But what about this? A worm. Is a worm conscious? Could they feel pain? Well, there's one certain way to find out and that is to cut it in half and see what happens.
You didn't really think I was going to do that did you?! But you know, if I was digging the garden okay and my spade accidentally cut through it, well we know what's going to happen. It would writhe about. It looks for all the world as though its in agony but both halves are writhing about so what do we make of that? Both halves are in agony? It now has two minds where it previously only had one? Or does it not have a mind at all? And what about these? Bacteria? I shouldn't have thought so. The Sun? Well no, definitely not the sun. Humans, definitely yes. The Sun definitely no. But where was the dividing line? How could we ever find out? Suppose when I buy my next updated computer I start keying something in.
Do I believe it? The computer's ticklish? It's having a conscious mental experience? Or has it simply been programmed to say that. The latest version of Windows. This is the problem of consciousness, how to understand the brain in relation to conscious mental experience. Are we dealing with two separate things – a brain and a mind – and somehow they're interacting with each other? That's one theory but it's not very popular these days.
Or is there just the one thing which we approach in two quite separate ways. One where we use a physical language and we use terms like atoms, electricity, spatial orientation and another more psychological language where we talk about pain and love and happiness - the kind of qualities you would never find in a physics equation. We need both of these languages, that's if one's going to have the fullest understanding of what's going on.
Consciousness poses a big, big problem. I don't see how we will ever have a fully satisfactory answer to it – not one that everyone's going to agree about. It's a 'close encounter of the first kind' with what I call the Boundaries of the Knowable.
You see, science, it has its limits. In fact one day science will grind to a halt, no more scientific discoveries. Not when we've discovered everything, no complete knowledge, nothing more to know, but when we have discovered everything that is open to us to understand. Which is not the same thing. Don't get me wrong. It's not going to happen soon. And the applications of science, they'll continue and there will be plenty of scope for new gadgets, things like that and updates of computers and Playstations, that sort of thing. Technology will continue. But not fundamental science. Not the discovery of new laws of nature. Now why do I say that? In the first place we have to consider what do we do our science with.This. But how do we come to have a brain in the first place?

According to the theory of evolution it's something that has been fashioned in past struggles for survival. It helped our ancestors to find food, shelter, a mate; it helped them to avoid predators. It was part of their survival kit. That being so, why should it be something capable of understanding everything about the world? That wasn't necessary for our ancestors to survive. A second reason why we might not be able to complete our understanding of the world has to do with practical considerations. I'm what's called a high energy nuclear physicist. It means I'm interested in discovering the ultimate structure of matter - what everything's made of and what holds it together. To do this we have to accelerate tiny subatomic particles to great energies and then we smash them together to see what happens. This is what does the acceleration - the Large Hadron Collider at CERN, just outside Geneva, the big international laboratory where I used to work. What we are looking at here is in fact just a small section of a great giant circular machine, 27 kilometres in circumference. That's Geneva airport to show you in comparison, give an idea of the scale.
As a general rule, each time we've built a bigger and more powerful machine, we've made discoveries that were quite unexpected. And this raises a question. What if it takes a machine, say, the size of the Solar System in order to discover the last crucial piece of evidence? No, there's no reason why the final clinching experiment has to fit in with what we humans happen to be able to afford, or can physically build. And without that last crucial piece of experimental evidence, our theories about the world could remain for ever incomplete. And then there's a third reason for suspecting that science will eventually fall short of providing us with a complete understanding of everything The fact that we can perhaps already discern where some of those limits might be. Stubborn questions that have been around for a very long time - questions to do with the nature of space... and of time...of matter.... of light... Stuff like that. Questions defying all attempts at resolution - perhaps because, for us, they are intrinsically unanswerable. They are at the Boundaries of the Knowable. How are we to understand consciousness is but the first of these questions.

After piece

Russell:
Stop sulking Wally, sorry if I frightened you. 'No animals were hurt in the making of this programme'. OK you've had your 15 seconds of fame. It’s now time to go back to work in the garden.