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## **Comment on article by John Mitchell**

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I much appreciated John Mitchell's article (*Science & Christian Belief* 32 1, 45) on whether we are 'sims', conscious simulation programs running in a computer set up by superhuman entities. It seems to me that his argument can be taken further – the sims proposal is even less plausible than he suggests. This becomes clear if we try to be more specific about it.

To simulate a given physical system, I need to know about its structure and the mathematics of its behaviour: the computer simulation then evaluates the same mathematics. Alternatively, I might decide to calculate something original, not really a simulation of anything at all. In either case, the procedure will involve the use of a high-level programming language, a compiler, machine code, electronic operations in a processor, and various binary registers. But my high-level code could probably be written in various functionally equivalent ways, and the executed series of electronic operations further depends on the particular compiler and the architecture of the computer. Thus, any given overall functionality is very unlikely to have a unique physical implementation. So a believer in sims must deal with a potential lack of specific physicality that could accompany a given conscious function. It must also be shown how only a small part of the physical computer activity is associated with conscious awareness. Most of it surely cannot be, as is entirely the case with our own computers (so we believe). Human brain operations are also mostly unconscious, but with certain neurons and their activities being of a consciousness-supporting type. I believe we are largely in the dark about how this works, but 'substrate dependence' is already clearly indicated here, involving different types of neuron, along with chemical effects such as when we sleep or wake or are anaesthetised. This complexity is perhaps understated by Mitchell, and it challenges any notion that certain sets of silicon components or electronic operations just simply produce consciousness – why should they? – while other apparently similar items do not. For a convincing sim concept, these matters have to be explained.

In addition, different silicon behaviours would need to generate different visual, audio, tactile and olfactory impressions, qualitatively different from other silicon processes and from each other. On top of this there is the 'binding problem' of combining different sense impressions into one unified experience – something that the conscious human does and is poorly understood. It would imply a holistic association of distinct regions of silicon. How is all this possible? In humans it is a given fact, but the sim proposer needs to justify it.

If it were to be supposed that the computer must be physically structured to behave like a human brain, then the idea of *emulation* has to be brought

in. An emulating device is a physical device that behaves in a similar way to a given system, a kind of 'working model' of the original. A mechanical robot might be a kind of emulator of a human being. A so-called 'flight simulator' contains both emulating and simulating features – enough physical similarity to the aeroplane cockpit to provide resemblance, but a large amount of computer power to evaluate the mathematics. A perfect emulator would be an analogue device with no need for computerised control at all. In the end, though, rather than considering ourselves as a working model of an original, it is simpler to believe that we and our universe are the original.

Still, it would seem that this is *not* what 'sim' proposers envisage – they suppose that it is not the physical structure but the formal behaviour of a complex piece of silicon electronics or similar that constitutes our conscious selves. But there are really far too many essential details that are left floating. With no clear specification of these things, the proposal is without value and seems like a piece of fantasy masquerading as philosophy.

Finally, if it is reasonable to suppose that we are the contents of a simulation by higher beings, then by the same argument it would be reasonable for them to believe the same. This implies that it is reasonable for us to believe we are a simulation run by a simulation. This can go on *ad infinitum*, which is an absurdity. Physical beings therefore have to be somewhere. In which case, it is simplest to believe that we are they. As Mitchell and others point out, Ockham's razor is highly relevant.