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Consciousness and Teleportation

*6th Swiss Biennial on Science, Technics + Aesthetics
Lucerne, Switzerland, January 22–23, 2005*

Every two years René Stettler, owner and director of the Neue Galerie in Luzerne, organizes and hosts the *Swiss Biennial on Science, Technics + Aesthetics*, an international gathering of scientists, philosophers, and artists for the purpose of discussing their views on a topic of general interest. Stettler has done this since 1995, with each conference centred on a thought-provoking topic. The topic of this year's conference focused on consciousness and teleportation.

The conference publicity material posited some interesting discussion points: Are there connections between brain functions, mental phenomena, and quantum physics? What does quantum entanglement tell us about ourselves? What role does consciousness play in the universe (or the universe in consciousness)? Will it ever be possible to teleport human bodies over distance?

The problematic influence of the observer's subjectivity on any measurement was noted throughout conference discussions. So I should say right at the start that my observing and reporting for *JCS* was as a subject whose area of focus is communication and science fiction. It was the latter that most attracted me to this conference, and I approached all aspects of brain science and physics as a fascinated outsider.

Practically speaking, yes, teleportation of a human body (much less its consciousness) is presently impossible, given current levels of knowledge and technology. Samuel Braunstein made this point quite clear when he noted that *if* teleportation *were* possible today, the transmission of information about an entire human being would take about 100 million centuries, about the age of the universe. 'It would be faster to walk,' he said.

Before we could ever have teleportation, however, there are problems with determining all the quantum information associated with a human being and Braunstein outlined these nicely. First, because of the Heisenberg Uncertainty Principle, quantum information cannot be measured completely. Additionally,

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Journal of Consciousness Studies, 12, No. 3, 2005, pp. 83–86

quantum information is too fragile to be copied — close scanning destroys the original state — and it is too fragile to be transported through conventional communication channels. In the end, unless the sender and the receiver share quantum entanglement, teleportation of quantum systems is, in his words, ‘not an experimental reality’.

Braunstein’s was the kindest dismissal of teleportation. Dick Bierman was more blunt: ‘This is science fiction.’ In fairness, Bierman was talking about his efforts to revisit earlier consciousness experiments by Abner Shimony and noted that results suggested that consciousness stands outside of quantum physics. This, in turn, suggests a return to dualism, he said, as do experiments where quantum states have been successfully transported over distance. This is a problem said Bierman, because if dualism is true, if consciousness is something separate and different from quantum physics, then it is impossible to teleport complete persons and their mental states. ‘But this is science fiction anyway,’ he concluded. Later, however, in one of the two free-ranging panel discussions, Bierman seemed to contradict himself when he said, ‘Teleportation has been shown to exist. May I suggest we return to the topic of the conference?’ No one responded to his invitation.

Austrian writer Oswald Wiener, referring to an earlier statement by chaos expert Otto Rössler — ‘Teleportation is magic’ — dismissed teleportation by saying, ‘As Rössler said, it is magic. However, it is magic that does not help anyone but banks and secret service agencies. It helps no one in everyday life.’

Rössler’s original statement was actually quite sincere, I thought. He characterised teleportation as another way to reach behind the curtain of the world (to learn more about the nature of reality) and attempted to connect teleportation, entanglement, and information, saying they all were magic, influenced by psychoanalysis, but may form a sort of medium for the conveyance of a message, like consciousness. ‘What does this medium look like?’ he asked. ‘It might be of interest for the future.’

Media artist Peter Weibel spoke about various ‘remote senses’ — technologies for extending time and space, for giving us the sense of being remotely present, like language and writing. Teleportation is the latest example of such technologies, he said, and the difference between telepresence and teleportation is that teleportation is an argument for Einstein’s ‘spooky attraction at a distance’ (quantum entanglement). Then, sounding very much like the late Marshall McLuhan, Weibel addressed Rössler’s query about the nature of a medium for conveying consciousness when he said, ‘with the era of tele- we no longer need a body or medium for the message. Quantum mechanics IS the message.’

This centring of quantum mechanics, and how it might be connected to consciousness, formed the focus for the majority of the conference. Braunstein, for example, talked about how if one wished to probe consciousness and determine ‘what was really there’, one could test the teleportation of various degrees of entanglement, ‘assuming you could control this’. Doing so would help determine whether quantum mechanics were behind consciousness. If consciousness comes through, even with quantum entanglement turned off, then we could know

that consciousness comes from something else. In short, teleportation might add to our understanding of the nature of reality and what quantum mechanics might allow us to do with that reality.

Stuart Hameroff, borrowing from A.N. Whitehead, called consciousness a sequence of events — ‘occasions of experience’ occurring in a ‘wider field of proto-conscious experience’ — not something that emerges from a complex set of conditions. Consciousness, he said, is the boundary of quantum subconscious, the edge between the quantum and classical worlds where superpositions collapse in the brain’s dendrites, some forty times a second. ‘Consciousness is a real thing and perhaps we will see it connected to the fundamental modern physics of the universe,’ he concluded.

Jack Pettigrew championed gravity, rather than quantum collapse, as the trigger for consciousness in his discussion of perceptual rivalry, the oscillation of experience despite an unchanging sensory input. Consciousness, he said, alters between the two brain hemispheres and assumes unique styles in each: the left hemisphere ignores discrepancies while the right wants to investigate them.

It was Pettigrew, an engaging and gregarious Australian, who made the best connection between science and art when he said, ‘Art looks inside, science outside. When we talk about the brain we are right at the boundary between the two.’

Beside Weibel, two other artists were included in the lineup of speakers: Jill Scott and Roy Ascott. Both had something to say about the connections between the science of understanding consciousness and the art of making this knowledge accessible to the rest of us. Different ways of seeing was the basis for remarks by Jill Scott who argued for more cooperation between artists and scientists to develop ‘a modern portal exchange’ where we can share ‘what seems to be more and more the central focus of our endeavours: the search for unity, wholeness, and consequent interconnectedness, what I call robust knowledge’.

Roy Ascott rose to the challenge of being robust: ‘Scientists do not know what makes up 99% of the Universe. Neither do artists.’ There is a great history of different ways of looking at the world, he said, and ‘not to tease out ideas from these other approaches seems foolish’. As he did at the previous biennial, Ascott outlined his thoughts regarding the investigation of the effects of psychedelic plants and other forms of virtual reality as a way of reframing consciousness as a layered entity where each layer represents or can generate a separate reality.

Seemingly striving for a scientific-artistic metaphor, and speaking about reduction rather than expansion, Lüder Deecke defined consciousness as ‘a mechanism of data reduction’ that derives from the necessity of addressing the overload of sensory input. We can compare consciousness to a spotlight, he said, that follows an actor across a stage. ‘It is not an epiphenomenon,’ he said, disagreeing with Karl Pribram who, during his own presentation said, ‘I think consciousness is an epiphenomenon, organizing the next stage of our conscious thoughts, thinking about what we are going to do next.’

Pribram, noted author of *Languages of the Brain* (1971), had argued earlier that ‘the brain does not cause consciousness, it enables the way we formulate our experience.’ He summarized his well-known holographic model of the

functioning of the brain (referring to response functions in the visual cortex, which he relates to hologram functions) as a useful metaphor for the brain. As for consciousness, 'It is a mistake to reify consciousness. It is not a thing, it is a process.'

So, as you can see, in the end, neither the speakers nor the audience were left with a clearly agreed conception of consciousness, where it resides, how it occurs, and whether it can be sufficiently observed. Instead, to borrow from the quantum mechanics discussed so often over the course of these two days, we have a number of complex potentialities. For the medical doctors and scientists, consciousness is many things: something emergent (or not), a state or property, a case of matter and energy, something that surrounds and/or enables us, something completely outside any currently known measurement device, a 'real thing' (Hameroff), 'a process' (Pribram), a 'layered entity' (Ascott), quantum collapse (Hameroff and Pettigrew), 'a message' (Rössler), or 'the processes underlying the construction and utilization of models to discover analogies' (Wiener). To the artists, consciousness is a different kind of portal, perhaps a kind of virtual reality where our attempts at explaining sensory input create something new from shared archetypes and metaphors. And to the philosophers, consciousness is an amazing richness of concepts, which, according to Josef Mitterer, would benefit from some discipline about how these concepts should be used. But what kind of discipline? 'A new language about old concepts may confuse the issue,' he said, 'and a new philosophy is perhaps going too far.'

With regard to teleportation there was complete agreement: it is currently impossible and conceivably will remain so well into the future, but if we understand teleportation as a physical process, then someone else should investigate it further.

In the end, spontaneity gave way to such carefully couched statements, as might be expected from a gathering of scientists and philosophers. Despite the iconic photograph on the conference poster of Mr. Spock, from *Star Trek*, who might, arguably be said to signify consciousness and teleportation, the conference proceedings, rather than following any flights of speculation, seemed to stay within safe discussions of basic quantum mechanics and ongoing consciousness research.

Forced to encapsulate what I would take away from this conference I would choose three quotes as positive pointers toward the next biennial, in 2007. The first is from Oswald Wiener who said, 'As we have learned from the philosophers, the things we do not know about are the things that we talk about.' The second is from Jill Scott: 'The public needs new metaphors which use imagination and creativity at the edge of knowledge to better understand the connections between science and art.' And the third is from René Stettler, who in his closing remarks, recited a phrase by physicist David Finkelstein, 'A final goal is not meaningful for physics anymore than a final painting is for art.'