

Association for the Scientific Study of Consciousness 10th Annual Conference

St Anne's College, Oxford, June 23rd to 26th 2006

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In its recent 125th anniversary edition, *Science* magazine listed the top 25 questions still to be resolved by science. The understanding of the biological basis of consciousness was placed second in importance only to the question of what the universe is made of. This explosion of interest in the study of consciousness over recent years is all the more remarkable given that it was seen as a topic barely suitable for scientific investigation just a couple of decades ago. Even now there are some who consign such research to the fringes of scientific acceptability. Nevertheless, it is clear from the 10th Annual Conference of the Association for the Scientific Study of Consciousness that the problem is attracting some of the most advanced investigators and thinkers working today, many of whom presented their latest research to the 300 or so attendees.

Although the conference is primarily scientific in purpose, there were a good number of philosophical contributions. Indeed the proceedings were initiated with a talk from Daniel Dennett – author of *Consciousness Explained* and recently elected president of the ASSC. In the fitting surroundings of the Natural History Museum in Oxford, he drew an analogy between the gradual evolution of biological species and the emergence of conscious thoughts, arguing that at no specific time or in no specific place can one say that a particular species or thought occurs. Each event, he claimed, is embedded in a wider temporal process that relies on the dynamic organisation of sub-events, none of which in itself constitutes the larger property in question. For Dennett, the personal mind is organised from numerous 'sub-personal' or 'robotic' neurological events, which are distributed in time and space and act collectively to produce conscious experience. This collective activity supports a kind of 'fame-in-the-brain' or 'cerebral celebrity' for those mental events we are aware of — these being Dennett's metaphors for the general propagation of conscious thoughts throughout our cognitive architecture. It was a philosophical argument, made with reference to certain empirical data, but nevertheless pointing to the deep conceptual problems we face in understanding the very thing with which we understand things, namely the mind.

Such introspection, however, was entirely absent from many of the scientific talks, which largely consisted in the presentation of experimental data that tended to measure degrees of 'awareness' rather than states of 'consciousness'. The neuroscientist John Driver, for instance, presented

research on cross-modal sensation and its effect on spatial awareness in which he showed that the ability to determine the position of particular tactile stimuli on the body is affected by visual and auditory cues. To give a simple example, it is harder to report which hand is being stimulated when both are placed close together as compared to when they are far apart. As Driver demonstrated, much evidence has accrued in recent years to support this cross-modal view of perception, in which each sensory pathway is significantly modulated by other pathways, with the consequence that the conventional notion that we experience the world through distinct senses is no longer tenable. The long-term aim of much research in the field is to discover some neurological basis for conscious experience, the so-called 'neural correlates of consciousness'. Recent interest has focused on the 'recurrent processing' that occurs when neural impulses from higher processing areas in the brain are returned to earlier processing centres from where they originated. The presence of this kind of internal feedback in the visual system can be shown to closely correlate with the subject's awareness of a particular event, and both Victor Lamme and Vincent Walsh presented experiments and arguments that supported this view in the first symposium. But as was made clear, although recurrent processing seems necessary for visual awareness, the question remains open as to whether it is also sufficient.

Christof Koch, one of the leading figures in consciousness research, picked up the neural-correlate theme in his contribution to the second symposium. Koch is currently conducting research that uses ultra-fine electrodes to record specific neural signals in human subjects. Intriguingly, he and his team have found that very particular cells responded to very specific stimuli. For example, in one subject a certain cell would respond consistently to images of the actress Halle Berry, even wearing different clothes and even to the text spelling out her name. Another cell would respond in a similar way to images of Jennifer Aniston, but would not fire when she was shown paired with Brad Pitt. Again it is somewhat of an open question as to what exactly this can tell us about the way our minds work, although some have seen in this research the sinister beginnings of a mind reading technology that calculates our thoughts from particular 'fingerprints' of neural activity. Koch was also very excited about the potential for genetically engineered neurons, which are currently being developed for controlling and studying neural behaviour.

Witnessing the quantity and quality of experimental data being generated in neuroscience labs around the world, one gets the impression that science, not philosophy, is making all the headway in consciousness research. In fact, on more than one occasion the question was raised as to what role philosophy might have to play in the future of the field. For those of us committed to an interdisciplinary approach to knowledge generation, it is alarming to think we might all be left bobbing about in science's wake, struggling to absorb the masses of increasingly intricate data, much of which is yet to be fully understood by those producing it let alone anyone else. The philosopher Dan

Lloyd — well known for his thriller novel about consciousness, *Radiant Cool* — suggested that the current enthusiasm for studying the brain by using momentary snap-shots taken with magnetic scanners might mislead us about the true nature of what the brain is doing. The working assumption in such techniques is that the slices of brain activity shown in the scans represent the 'present' state of the brain (and by implication, the mind) at the moment the image is taken. Yet, applying Husserl's concepts of 'protention' and 'retention', in which a given thought carries with it a sense about the future and the past, Lloyd argued that each momentary state of the brain also embodies anticipations and memories, something that is largely unaccounted for in current interpretations of the scanning data. This seemed to be a case in which an argument from philosophy could potentially affect the method and object of the scientific research.

So are we any closer to understanding what consciousness is and how it works? Probably not much. But it is clear from events like the ASSC conference that the problem of consciousness is having a profound impact on our contemporary intellectual landscape. If, as some suggest, it is a purely mechanical problem, like understanding how a bee flies, then perhaps it is best left to those with the expertise to objectively study the mechanics. But if, as others hold, it engages the deepest metaphysical aspects of subjectivity then it may remain impervious to objective investigation and mechanical explanation. Recent attempts to fuse the empirical and philosophical approaches as in neurophenomenology [1], or to combine neurobiology and aesthetics as in neuroaesthetics [2], seem to be symptomatic of a wider recognition that the nature of conscious experience is *both* objective and subjective. In which case the broadly accepted and historically pervasive distinction between these two categories of knowledge may be in danger of collapse. Understanding consciousness becomes then the basic question facing those who try to make sense of our existence — arguably even more basic than what the universe is made from. Moreover, it is a question in which we all share a stake.

The conference itself was very well organised and amply accommodated within St. Anne's College. There were a variety of keynotes, symposia, workshops, poster sessions, covering a range of topics — from animal consciousness to machine consciousness — and provision to encourage students and new researchers in the field. The meeting moves to Las Vegas in 2007, as is highly recommended for anyone seeking access to the state of the art in the study of this most elusive aspect of the mind.

[1] See review of *Between Phenomenology and Neuroscience*, Towards a Science of Consciousness Conference, Prague, 2004. *Leonardo Reviews*, August 2003.

[2] See review of *Inner Vision* by Semir Zeki, (Oxford University Press, 1999). *Leonardo Reviews*, May 2003.