

TWO IN TUCSON

Reports on the “Toward a Science of Consciousness” conference (April 8-12, sponsored by the Center for Consciousness Studies, University of Arizona) and “The Dark Side of Consciousness” conference (April 10-14, the annual conference of the Society for the Anthropology of Consciousness)

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Frederick: After about nine years working on the physical and technical side of neuroscience, a departure from my work as an undergraduate philosophy major, the Tucson conference was an inspiring reminder of why I became a scientist. The “hard problem” of biopsychology— how and why subjectively felt qualities are so remotely different from the physical, chemical, and anatomical properties of the brain—is what originally convinced me that I needed to understand both sides of the “bridge equations” I was trying to find. Staffing a MAPS information table, I answered questions about my own research interests that forced me to focus and re-examine my psychedelic-inspired research proposals that I haven’t looked at in many years.

I think that psychedelic drugs act as psychophysiological “stains,” enhancing the conscious resolution and contrast of subconscious psychological and physiological processes, just like histochemical stains allow light microscopists to differentiate subcellular organelles from the background in a tissue slice. It is commonly believed that psychedelics can bring out subconscious content of the Freudian or Jungian variety. I also happen to believe that much of the “noisy” or uninterpretable hallucinatory content results from a sensory cross-over or “synesthesia” from subconscious sensory modalities, such as those detecting changes in the internal organs. I believe that psychedelics like psilocybin, in relatively low doses, could help biofeedback therapists to train patients to more quickly learn physiological self-regulation skills, by allowing them to more readily differentiate the internal source of the subconscious signal that the biofeedback equipment is displaying.

Several presentations at the “Toward a Science of Consciousness” conference suggested to me that the time is ripe for reintroducing psychedelic drug effects as a variable in experiments studying consciousness. On the first day, a number of speakers talked about the implications of “sensory substitution” experiments. A promising new breed of “sensory prosthetics” are being engineered and marketed that allow, for instance, blind people to “see” the visual world using an auditory or tactile interface. Peter Meijer of

Philips Research Laboratories presented the VOICE interface, which represents the height of an object with pitch, and its position from left to right as a time delay over a 1-second scan (visit www.seeingwithsound.com for examples). The resolution is about 60 x 60 pixels, black-and-white. Interestingly, after sufficient training, blind subjects report experiencing images in space rather than sound, and can also listen to conversations or music without confusion. The phenomenon of sensory substitution led some philosophers at the conference to suggest that at a fundamental level, the content of perceptual consciousness should be conceptualized not in terms of the sensory organ involved, but rather in terms of the behavioral goal, and the feedback received in pursuit of that goal. One of the problems with this research is that a considerable amount of training is required to learn the new cross-modal skill.

Could psychedelics be used to enhance the rate and extent of learning to represent tactile or auditory signals visually? The phenomenon of synesthesia, “hearing colors” or “seeing sounds,” is often reported by subjects during psychedelic drug experiments. We should also take seriously the developmental differentiating effects of psychedelics—that is, their ability to induce a psychological state in which people report seeing their particular developmental path as one reality among many potential realities. While this property of psychedelics is better understood for expanding one’s consciousness into alternative emotional and philosophical realities, it is an open empirical question whether psychedelics could help to expand the consciousness of one sensory modality into

the practical skills of another.

The functional anatomy of rewiring the auditory cortex to perform visual tasks was described in a presentation by Mriganka Sur of MIT. During development, growing axons from the visual system are usually blocked from forming synapses with the auditory areas of the thalamus by a protein called Ephrin A. If the growth of axons from the auditory system to the brain is blocked in young mammals, Ephrin A is no longer produced and synapses are formed between the auditory thalamus and axons from the

visual track. Interestingly, the areas of the auditory cortex to which the auditory thalamus projects then develop columns of cells that selectively respond to visual stimuli. Visual space becomes mapped in the auditory cortex in a manner similar to what is normally seen in the primary visual con-

text. A similar re-mapping of the sensory cortex occurs when a person loses a limb. The cortical region that previously responded to sensory input from the limb becomes sensitive to tactile input from the face, resulting in “phantom” sensations from the missing limb. This is not unlike the general hallucinatory phenomena that happen during sensory deprivation, such as that which can occur in flotation tanks. Deprived of the normal sensory “signal,” the cortex tunes into and imposes order on the background “noise,” which—in this case—is the activity of the adjacent cortex that is processing tactile input from the face. However, the phantom limb cortex maintains “top down” processing, experiencing sensations from the face in terms of its previous experience with the limb. Gradually, the perceptual experience of the limb shrinks as the

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cortex is reprogrammed to the new patterns of input and output. Like the blind patient who needs to attend to the spatial information rather than the sound in Peter Meijer's VOICE interface, the phantom limb patient also needs to suspend the top-down processing of one sensory modality to allow it to "re-imprint" the sensorimotor contingencies of another.

It is not very controversial to say that psychedelic drugs cause abnormal sensory associations to occur. When sensory substitution is an essential therapeutic goal (*i.e.*, as opposed to a very bad idea when operating a motor vehicle), this suggests the hypothesis that psychedelics could help facilitate the cross-modal sensory "permeability" that is needed. Possibly, lower doses may provide this effect during regular training procedures, without excessive distraction to the patient.

Hanna: William S. Burroughs said that "language is a virus." Taking this idea a step further, the English psychologist and writer Susan Blackmore, who presented at the "Toward a Science of Consciousness" conference, might feel that "culture—or perhaps even consciousness itself—is a parasite." Or at least they are symbioses, which hook into our meat puppets and make us dance. A proponent of the "meme" theory (see **Gamma** below), Blackmore's name was excitedly mentioned to me by virtually everyone I met the night before the conference. After checking out her talk on "the contents of consciousness," I could see what the buzz was about. Following the "Toward a Science of Consciousness" shindig, at the Society for the Anthropology of Consciousness' annual conference, I mentioned Blackmore's name and meme theory to a friend that hadn't heard of her. Within mere minutes of the end of that conversation, Stanley Krippner joined us and out of the blue asked my friend, "Have you heard of Susan Blackmore?" In the manner in which memes spread from mouth to ear, Blackmore has hitched *herself* to a powerful concept.

Gamma: Susan Blackmore, author of *The Meme Machine* (Oxford University Press, 1999), headed a workshop on memetics. Memetics is the study of "memes." So what is a meme? Literally, a meme is "that which is copied," or "that which is imitated." If I tell you that Rick Doblin's grandmother saw a UFO land in her backyard, and you tell this to your friends, and they tell it to their friends and so on, what we're spreading is a meme. Other examples of memes are the story of the old lady who put her poodle in the microwave (with devastating consequences), a haircut that becomes popular, a fake computer virus warning that spreads, or the religious belief in life after death (or any other religious idea). It doesn't matter whether memes are in any sense true or not; it is only important that they spread.

While all this may seem like nothing much, the theory of memes gains scientific credibility by obeying the rules of Darwinian evolutionary systems. The home territories of Darwinian evolution are genes and organisms. Different organisms will have differential reproductive success according to how well they are adapted to their current environment: the better adapted an organism is, the more offspring it will have, and the more its genes will spread in the gene pool of the species. The same process is at work in memetics: different memes reproduce or spread with differential success, depending on how well they survive in their natural environment. In this case, the natural environment is of course human minds—or, in some cases, computers' operating systems (preferably "Windows"). As in living organisms, where genes can mix up and recombine with other genes, memes in the human mind can mix up and recombine with other memes. We can see that the basic ingredients of Darwinian evolution are present in memetic systems just as they are present in genetic systems.

What is memetics supposed to explain? According to Blackmore, the evolution of memes shaped or even created the human mind, including our language ability. Regarding con-

consciousness, Blackmore proposes that memes may distort consciousness, and by clearing our minds of them—by meditation, for example—we might see more clearly what consciousness is. The famous American philosopher Daniel Dennett, however, thinks that our memes *are* our consciousness.

Despite its apparently sound scientific foundation, memetics is not taken seriously by many scientists. What may be the reasons? One possible reason became clear to me during Blackmore's workshop. The theory as she presented it spoke exclusively about how memes shape human minds, seize control of them, and use them to spread more copies of themselves. Like the "selfish genes" of Richard Dawkins (who popularized the idea of memes), memes are supposed to be selfish too—using human minds for their own purposes. Hence, human minds seem to be reduced to mere breeding sites or copying machines for memes. This view is deeply dissatisfying, as it leaves out the active role of the mind in forming beliefs and judgements, shaping our opinions, and making decisions. Moreover, it appears to threaten our dearly-held beliefs about free will, rationality, and being the subjects of our own actions. Some think that if one embraces such a view, the only consequence can be fatalism: the helpless acceptance of one's life being controlled by alien forces. Blackmore doesn't agree with this pessimistic conclusion. Nevertheless, Blackmore's exposition of the subject left crucial questions about the active role of the human mind in creating and manipulating memes unanswered, in the same way that popular views of genetics tend to ignore the importance of non-genetic influences on human mind and behavior.

Hanna: Other noteworthy plenary sessions included the discussion of "Machine Consciousness" with Ray Kurzweil and Rodney Brooks—which exposed the current state of artificial intelligence and robotics and postulated about future directions, and V.S. Ramachandran's dis-

ussion of "Art & the Brain"—which presented a number of fascinating neurological correlations between aesthetics and synesthetic perceptions. My own presentation at "Toward a Science of Consciousness" was to be a slide show of psychedelic art during the concurrent session on "altered states of consciousness." (Susan "there she is again" Blackmore was the discussant of this session.) Unfortunately, the conference producers failed to provide the slide projector that they had promised, leaving me high and dry. (Charles Tart, who also presented during this session, had to go on sans overhead projector as well). This left me with a fair amount of time to plug MAPS to the 130 folks or so in the audience. It was encouraging to see that nearly 25% of those in attendance at "Toward a Science of Consciousness" showed up for this session, which was the most well-attended concurrent session at the conference. Although people interested in psychedelics are clearly a subgroup of those interested in consciousness studies, I feel that anyone interested in psychedelics would have gained a lot from attending the "Toward a Science of Consciousness" conference.

As well, the Society for the Anthropology of Consciousness conference on the topic of "The Dark Side of Consciousness," featured a great panel discussion on *Datura*, numerous presentations on aspects of shamanism, a slide show of sacred sites across the world, drum circle workshops, a discussion of the relevance of a Huichol Indian artist's use of color, and ideas about dream theory, the origins of religion, techno culture, alternative medicine, multidimensional mind models, and much more. We heartily encourage more MAPS members to attend future conferences produced by "Toward a Science of Consciousness" (<http://www.consciousness.arizona.edu>) and the Society for the Anthropology of Consciousness (<http://sunny.moorparkcollege.edu/~jbaker/sac/home.html>). ■