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A Conference and a Question[1]

Report on Consciousness and Spirituality II

Mediation: Neuroscience Approaches and Philosophical Implications, Feb 25–27, Freiburg, Germany.

These things don't have official markers, but if there are markers, the Feb 2010 'gathering of experts' in Freiburg, Germany confirmed the existence of (dare I say inaugurated?) the scientific and phenomenological field of 'Spirituality Studies'. This was the second such small conference, which as a result are fast making Freiburg University the epicentre of this new field.

Don't confuse spiritual studies with the field of 'religious studies' by the way. As defined by Stefan Schmidt and Harald Walach, the energetic and clear headed conference conveners, we should distinguish spirituality from religion in its empirical methods, its focus on first person experiences and its non-reductionist approaches. Not unrelated to the focus of this journal. I find it heartening to see this area of study so fast coming to the respectability it deserves.

To remind our readers, during the first Freiburg 'gathering of experts', June 2008, as reported in this journal (Forman, 2008), a

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[1] I am grateful for helpful comments from Antoine Lutz, Britta Hölzel, Guiseppe Pagnoni and Harald Walach. I am especially grateful for editorial comments from Stefan Schmidt. Brian Lancaster and Thilo Hinterberger gave excellent feedback on an earlier draft of the hypothesis herein. But of course I remain fully responsible for any misrepresentations or errors.

consensus emerged that (a) consciousness is a distinct and fundamental element of reality, that (b) the brain does not excrete or cause consciousness but (c) serves as its transducer, like a radio transduces radio waves. I expected that this conference would move the theory forward one notch or even confirm the thesis. In this I was and was not disappointed. It certainly moved our understanding forward. But it neither confirmed nor denied the thesis, nor did it even come to a generally accepted conclusion. Perhaps this was because the earlier meeting was about the general relationship between consciousness and spirituality while this later one looked at the field of meditation research as a specific example to study in depth this relationship from a neuro-scientific and philosophical perspective. Nonetheless I found myself leaving with an enormous question — more of this at the end.

I say it moved our understanding forward. Coming through its cornucopia of generally excellent talks, some fascinating leitmotifs bubbled up. I would identify six major leitmotifs.

1. Integration of phenomenological and neurophysiological studies.

One of the leitmotifs of the gathering was a repeated call for the integration of first- and third-person reports. While many years ago TM researchers identified characteristics of 'wakeful but contentless consciousness', too few studies have been able to find physiological correlates of specific experiences. Arthur Zajonc suggested there is a need for a coherent thesis that taps both first- and third-person methods, Allan Wallace suggested an approach that weaves together the physical, the biological and first-person observation of mental states.

As if in answer, Antoine Lutz suggested that the experience of decrease in mental chatter is paralleled by the brain's more rapidly coming to rest after a moment of cognitive dissonance. Britta Hölzel changes in the right insula, the hippocampus and the posterior cingulated cortex after eight weeks of meditation training, which seemed to be correlated with an increase in first-person experience of non judgmental awareness.

2. Distinctions of meditative type and level.

Meditation research has been criticized as being too sweeping. That is, studies of naïve meditators were taken to point to long term effects, and studies of practitioners of one tradition were taken to point to all practices. Taking their lead from Stefan Schmidt's typological model of meditation programs, several of our talks distinguished the effects

of meditation practice on naïve practitioners from more expert practitioners.

Thilo Hinterberger, for example, found that the years of meditative practice could be generally correlated with greater amplitude coherence of Beta and Gamma — the more experienced the meditator, the higher the amplitude coherence. Ulrich Ott found that, while it decreased in both compared to controls, the anterior 'default mode network' becomes less active in the advanced than the beginning meditator.

3. Increased neuroplasticity.

Antoine Lutz found that mindfulness training enables one to disengage attention from distractions more rapidly. The brains of meditators, compared with controls, were able to recover from conceptual anomalies more rapidly, seemed less 'caught up' in judgments and able to stay focused longer.

Giuseppe Pagnoni asked his subjects to distinguish a word (i.e. apple) from a non-word (i.e. burig) and watched the evoked brain processes. Asked to return to a focus on the breath after confronting these moments, he found that compared to controls', meditators' brain activity returned to its baseline faster. Such faster renormalization in meditators suggests an improved capacity to let go of the automatic conceptual 'resonances' triggered by such disjunctions.

4. Inhibition of the Default Mode Network.

Ulrich Ott found that the 'Timeless Wisdom' meditation practice inhibits the recently discovered 'daydreaming' brain pattern, the Default Mode Network (DMN), in which neurons oscillate at a rate lower than one every ten seconds. Just as daydreaming decreases as mindfulness increases, so he found does the DMN.

While he did not research the DMN, Ott's talk paralleled Lutz's finding that after three months of Vipassana meditation training, people were more able to stabilize their attention on target tones, as indicated by both more consistent brain responses and reduced variability. These findings parallel the phenomenological report that meditation is a state of more focused attention than mere daydreaming.

5. Increase in grey matter density.

Meditators should be heartened to hear from both Guiseppe Pagnoni and Britta Hölzel that the grey matter density within certain areas of their brain increases with their practice. Meditators did not show the

typical age-related decline of attentional performance and cerebral gray matter volume.

An Emerging Hypothesis.

Now I'd like to return to that thesis from the first gathering. Again, though I went curious about whether and how the meeting might advance the thesis one notch, the gathering was more tantalizingly suggestive than conclusive. Yet leaving Freiburg, I found myself pondering a hypothesis about consciousness and the brain that I for one saw emerging.

Several speakers reminded us of how the minds of control groups (viz. most people's minds) wander, tend to get distracted easily, and get lost in daydreams. A whole set of brain processes seem to undergird this familiar 'monkey mind'. We heard about 'mental binding', the 'creation of the sense of self', the 'tapping of memory' and what the energetic young scholar Norman Farb called the 'building of our story'. Such first-person processes seem reflected in the activity of the Default Mode Network. The brain in other words is very active in the creation of such everyday thoughts. The buffeting of thoughts is reflected in what one participant called 'a constant neural buffeting'.

But the brains and experiences of meditators, we heard, seem different. It seems to be easier (i.e. faster) for the meditator's brain to let go of thoughts, let go of conceptual anomalies, and settle back to calm after a moment of cognitive dissonance, and the like. It seems to take less *effort* for an experienced meditator to think and let go of thinking than others. In both first- and third-person reports, we see less 'bubbling of thoughts', less distractions, and less activity in the brain that reflect the wandering of one's attention hither and yon. Experienced meditators seem, as one put it, to 'use less energy', or to stay in or to come back to calmness more easily. Pagnoni found that meditators are taken up with the 'shadows of thought' less.

Similarly Ulrich Ott finding that the DMN becomes less active or entirely inactive in the brains of advanced meditators seems to suggest that its self-constructive processes are lessening. Dietrich Lehman's finding of decreased functional connectivity between brain regions in advanced practitioners suggests again that the brain is working less to integrate features of experiences.

These studies all suggest that the normal processes of binding, creating the sense of self, recalling memory and other mind chatter all seem to decrease in the brains of advanced practitioners. This is no doubt connected to the decrease in the DMN that we observe. That's a

lot of self constructing that we are *not* doing. I would suggest that the advanced meditator's brain is reflecting less and less role of the construction of experience.

Yet in other ways brain activity is *increasing*: Hinterberger found *increased* Gamma and Beta, Ott found *increased* activity in the left Angular Gyrus.

There is no question that in ordinary experience the brain is active in the undergirding or constructing of our thoughts and feelings. But our evidence suggests that the advanced meditator's brain may be less active in the construction of experience and may be mediating conscious experience less.

The meditator's brain may be, as Pagnoni suggested in a fetching metaphor, committing a kind of brain suicide, leaving one free to experience consciousness in itself in a more direct, less constructed manner.

I find myself wondering if just as a photon is both a particle and a wave, perhaps consciousness too has two complementary aspects. In ordinary states of consciousness, perhaps we are constructing the sense of self, thinking about specifics, following our remembered history, etc. That is consciousness is actively building the sense of being a particular person — like a particle.

But there may be another aspect to of consciousness as well. As one moves towards mystical stages and states with meditative practice, this other, complementary, wave-like side of consciousness comes more to the fore. In it the increased focus we see reflected in brain processes leads towards the experiences of self-transcendence and being beyond space, time and the personality. Here we experience the side of consciousness that is wave-like, spread out and non-specific.

As opposed to two *discrete* aspects of consciousness, we might also suggest a *continuum* of consciousness: more self-constructive activities of consciousness and of the brain and, as one practises meditation or some other self-transformative processes, less. The more focalized experience of consciousness in itself, experienced either unaccompanied (i.e. in a pure consciousness event or a *Samadhi*), or accompanied (in some more permanently illuminated stage like *Moka* or *Nirvana*), would naturally be correlated with such brain features as increased Gamma energy, increased coherence, etc.

If one is less emotionally caught up, less stuck is in one's inherited assumption system, we would expect to see different kinds of brain activity in support. And so we do.

And, we would predict, when the self constructive brain activity falls to nearly nil, we would expect to hear reports of spiritual experiences. And indeed we see both features in Near Death Experiences.

In other words I am suggesting that there are two complementary aspects of consciousness which are correlated with two complementary kinds of brain activity . Some brain processes help us to construct the sense of self in all its sweaty particulars. And the other, more highly focused and less distractable processes lend support to the more mystical experiences of consciousness in itself.

The evidence is admittedly scanty. I offer this as at best a tentative (and testable) hypothesis.

To be clear, I am hypothesizing two discrete types of conscious experience or two poles of a continuum of conscious experience, and an inverse relationship: *the more powerful the phenomenological sense of self, the more active and multifarious the brain is in constructing the sense of self and ordinary experience. The more powerful the phenomenological sense of consciousness is in itself, the more focalized and coherent is the brain activity.*

If you have evidence that tends to confirm, disconfirm or refine this developing hypothesis, please send it to me: Forman@TheForge.org.

Reference

Forman, R.K.C. (2008), 'A watershed even', *Journal of Consciousness Studies*, **15** (8), pp. 110–15.