Review of: "The Case for Conscious Experience Being in Individual Neurons"

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The authors claim that there is no ‘brain-wide’ single consciousness in organisms but instead consciousness resides in single neurons. They suggest that this view provides the only plausible biological and physical explanation for consciousness.

I have two aspects to raise reading this paper. First, quite generally and rather supportive, the idea as such is fairly (not completely) new, interesting and deserves consideration within the still highly enigmatic field of consciousness studies. At this stage even strange possibilities that might get us closer to a deeper understanding of consciousness should not be excluded. And, the search for ‘meaning’ is open in science, not a forbidden wish as science comes from scientists and they all searched for meanings.

The present proposal is very much inspired by the fact that up to this point we have not found or cannot find a convincing physical mechanism that ‘combines’ or ‘binds’ single cell responses (the ‘sensorium’ of single neurons as the authors name it) or even larger ensembles of segregated receptive field properties into the kind of unified experience at an instant of time that a person as a subject has. In the final dialogue one of the authors considers this unified state of a person as ‘..an illusion of phenomenal singularity’. At first glance it seems rather logical to forget about ‘binding’ all together and allow for every cell having its own experience. At least such an approach seems to free us from not convincingly solving the binding problem. However, the remark about the illusion of a unified state of consciousness, the phenomenal singularity in persons, sheds light on some misconception at the basis of this work. And this brings me to the second, more critical aspect.

As the authors really never care about defining how they interpret ‘consciousness’, e.g. in the sense of basic biological ‘sentience’, pure phenomenal qualia or the rather anthropocentric concept of a psychological state of ‘cognitive awareness’, the flaw is to misunderstand the meaning of ‘illusion’. In short, we usually define ‘illusion’ as the discrepancy between subjective experience and the physical descriptor of the same sensory situation. The range of these illusions is wide, starting at the level of receptor signals (e.g. ‘Hermann’s grid') and propagating into more abstract levels and ‘cognitive illusions’ ('the planet is flat') in central areas. As the number of synaptic distances from receptor sites increases illusions become more erasable. It can easily be shown that in this sense every conscious experience is an ‘illusion’ to a more or lesser extent. Consciousness did not evolve to tell us ‘the truth’ about the world, but to let us adapt to the circumstances found in this world. So, the cited ‘illusion of phenomenal singularity’ is precisely what we mean by conscious experience of a subject, it is not an illusion of an illusion, it is the subjective illusion as such. There is simply nothing else to talk about.

Yet another critical aspect emerges when the authors try to specify a physical mechanism subserving consciousness and operating on single cells, i.e. the ‘neural correlate’ question. Generally the whole problem of binding ‘brain wide’ properties into one united state appears to be shifted down to the level of single neurons. This may be easier but still needs plausible clarification. It has become ‘fashionable’ to involve rather strange physical properties as candidates for neural correlates, e.g. the involvement of ‘fields’ in the form of ‘solitons’, ‘phonons’ or ‘conformons’ and of course to bridge to their quantum physical notation. More and more new contributions are trying to land a hit, but the problem’s radicality is persisting. It is not really possible to completely avoid a pan- or at least a micro-psychistic interpretation when it comes to consciousness studies and minimal physical correlates. In some or another way ‘brain wide’ or at the single cell level, extended spatio-temporal variation of signals (the ‘mean field models’) must show a transition to a ‘mass model’, a point like event in time without a particular location in space (e.g. the Friston conception, Pinotsis et al. Front. Comput. Neurosci. 8,149,2014). Would a phonon mode, the non-localized standing wave vibration interacting with membrane potentials, ‘the hearer’ in the authors view, meet this criterion? If so, one needs more and deeper argumentation to make this plausible.

Finally, I want to add, that despite the above critical comments I find the assay of Edwards and Somov inspiring and an enrichment for discussion. At this stage it is more a letter of opinion rather than a scientific report and I would it find easier to digest if the authors had been more modest in their claims. For example suggesting a kind of ‘sentience’ to single cells as the ‘seeds’ of subjective experience from where an object knowing concept derived from the ‘brain’s story’ can create consciously perceived qualities.