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

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Commentary on Edwards and Somov.

There are many views, or I should say hypotheses, currently on human consciousness and not all of these require neural functions. So this adds another to the burgeoning list.

Everyone is entitled to their own point of view and to hve thempublished, and thus I support publication. The issues I raise below are not essential, for its acceptance.

Having looked at a number of consciousness theories my own preference is for Integrated Information Theory. That of course may change as knowledge progresses but IIT does allow single cells to possess consciousness (Tononi and Koch (2015) Phil Trans R Soc B 370:20140167) so could be used as support by the authors but there is no absolute requirement in this theory for dendritic trees. They are simply covered as integrated information which is what a dendritic tree is surely. fWorth a mention? There is of course the theory that identifies vibrations of the microtubular structures in single cells as integrating together to produce consciousness Surely Hameroff and Penrose is worth a mention here Hameroff Phil Trans R.Soc A (1998). 356: 1869-1896.Whether any of the multiple views proposed for consciousness survive intense and critical investigation I do not know but their predictions are being investigated at present. Perhaps they may end up with coming down to Edwards and Somov in the end.

Now to the manuscript in question. I think it is well written and I fllow the arguments but there are some problems that I see in identifying a single dendritic tree as being the conscious entity.

(1). Why has the brain increased in size through evolution? If all that was needed were single dendritic trees why bother with the problems of large brains and in particular the human version with the birth difficulties it presents.

(2). The size required for a brain or numbers, of perceived signals. Every word is surely a signal and I have been told though never looked, that the greater Oxford English dictionary has half a million. Presumably the compilers may be limited in number but surely a thousand is nowhere near the required neural complexity. Isn't there a further issue with phrases and groups of words that we recognise how many of these does the brain contain and can summon up. My understanding is that the Irish Mathematician Hamilton could speak with reasonable fluence 14 languages by the age of 14.

(3).There is a wealth of evidence concerning both functional specialisation of the human brain and hemisphere

differences (e.g split brain investigations) and the results from brain lesion subjects. All of these would surely not occur if just a single dendritic tree provides for consciousness and presumably other functions. (De Haan et al., Neuropsychol Revs (2020) 30:224-233.). How does a single dendritic tree integrate visual information from two different eyes?

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