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“Cellular basis of consciousness”: Not just radical but wrong

Commentary on [Reber](#) on *Origins of Mind*

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Abstract: Reber (2016) attempts to resuscitate an obscure and outdated hypothesis referred to as the “cellular basis of consciousness” that was originally formulated by the author nearly twenty years ago. This hypothesis proposes that any organism with flexible cell walls, a sensitivity to its surrounds, and the capacity for locomotion will possess the biological foundations of mind and consciousness. Reber seeks to reduce consciousness to a fundamental property inherent to individual cells rather than to centralised nervous systems. This commentary shows how this hypothesis is based on supposition, false premises and a misunderstanding of evolutionary theory. The cellular basis of consciousness hypothesis has little explanatory and predictive power with regards to subjective experience.

Keywords: subjective experience, phenomenal consciousness, awareness, evolution, hypothesis

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Reber (2016) proposes that “any organism with flexible cell walls, a sensitivity to its surrounds and the capacity for locomotion will possess the biological foundations of mind and consciousness.” Although he provides no evidence for his belief that organisms “have minds because minds are an inherent component of organic form,” Reber is at least upfront in declaring his power to decide which organic matter can be conscious (plants and fungi are excluded). Reber proposes that the standard explanations of the role of neural tissue in subjective experience are flawed because they depend on a “miracle” to bring forth consciousness. He believes that because the neural basis of subjective experience is not understood, a “miracle” must be needed to explain it. This conclusion is unreasonable. For example, from the fact that the structure of DNA was unknown before 1953 it does not follow that explanations of DNA structure relied on a miracle before that time. The unknown should not be equated with the need for some miracle. Interestingly, having raised the notion that scientific approaches to subjective experience were dependent on a miracle, Reber admits that his own hypothesis relies on a miracle since he gets to choose which types of organic matter can be conscious (but he justifies this as just a little miracle).

Reber arrives at his so-called solution to the “hard problem” of consciousness by appealing to the idea that the emergence of subjective experience must conform to evolutionary principles (at least, as he understands them). He stresses that significant

functions, such as subjective experience could not possibly arise suddenly and mysteriously only in humans because evolution progresses slowly over time. On this basis he believes that a form of subjective experience emerged early in the timeline of human evolution and was subsequently and progressively modified to become more complex and powerful. *Post-hoc* reasoning can sometimes be correct when dealing with an entity that is concrete in form and unambiguously identified in all animals, such as the nucleus. However, when a function such as subjective experience arises late in the timeline of human evolution and is also not easily observed or quantified, this reasoning fails. In the latter case what is needed is an independent marker of subjective experience to reveal its presence in close and distantly related species (Key, 2015; Key, 2016). Reber mistakenly chooses his own unsubstantiated markers of “flexible cell walls, a sensitivity to its surrounds and the capacity for locomotion.”

Reber does not appreciate that novel and significant form and function can emerge any time during evolution through genetic modifications. Precursors or rudimentary versions of these characteristics do not need to have existed in earlier common ancestors. One example is gene duplication; it enables genes to take on new and innovative functions not shared by early organisms. EvoDevo abounds with examples of the emergence and spread of novelty (genetic and phenotypic) in animal populations (Peterson, 2016).

What most people will find difficult to accept is that Reber’s hypothesis extends beyond animals with nervous systems to single cell organisms. While there is nothing unique in proposing that only animals have the capacity for subjective experience, it is rather a long bow to draw to suggest that organisms without a nervous system possess subjective awareness (unless the definition of subjective experience is radically changed to remove its subjective nature). The power of any good hypothesis is revealed by its ability to (i) make new predictions that are experimentally testable and capable of advancing knowledge, and (ii) explain existing knowledge and future observations. Unfortunately, Reber’s hypothesis fails on both accounts with respect to subjective experience. What we are presented with is a weak hypothesis with little explanatory or predictive power.

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