

## Reber's caterpillar offers no help

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

**Carl Safina**

Marine & Atmospheric Sciences  
Stony Brook University

**Abstract:** Reber's target article "Caterpillars, consciousness and the origins of mind" seems only to shift but not to address the question of where the mind is and how minds occur.

[Carl Safina](#) is the inaugural endowed professor for nature and humanity at Stony Brook University, where he co-chairs the Alan Alda Center for Communicating Science and is founding president of the not-for-profit Safina Center. [Beyond Words: What Animals Think and Feel](#) is Carl's seventh book. <http://safinacenter.org/about-carl-safina/>



Reber's (2016a) target article "Caterpillars, consciousness and the origins of mind" is so well written that I don't think I misunderstood it. So I feel fairly comfortable saying that it isn't very scientific (it offers no evidence) and it offers no explanation of anything. As for the problem it seeks to "solve," it merely kicks the can. We're left with the same question and the same problem.

If the question of how a brain creates a mind is replaced by the question, "How does a living thing create a mind?," well, we still have the same question. If looking for the answer in neurons is replaced by looking for the answer in a cell, well, we still have the same question. If the question is addressed by asserting that sensation is a quality of all animal cells, that's just a hypothesis in need of data.

In place of evidence Reber offers an axiom followed by elaboration, but no information. His axiom is 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." In his Response, Reber (2016b) writes, as though burnishing his axiom with a more determined assertion: "Single cell organisms feel. There is something it is like and feels like to be a bacterium. The first order of business is to work out the protein folding mechanism(s) that give rise to these kinds of subjective states."

As a child I was taught that God made everything but nothing made God. "God always was," was taught as the answer. Reber tells us essentially that every soft-sided cell is conscious but nothing makes consciousness. Some people think that everything — every sub-atomic particle — has consciousness. The idea might be intriguing; it might even be correct. But we have no information at all to suggest that it is.

Reber appeals to analogies in physics. All matter "has" gravitational force, whether we understand why or not. So why can't we say that all soft-sided cells have sensation? Because the

gravity of matter can be detected and measured. If consciousness is a quality of all life, or of all matter, evidence is still needed in biology, no less than in physics. The sentience of cells would need evidence before scientists could believe it. Past his assertions and in his Response, Reber seems to backtrack into, “I’m just saying we should look to cells, not brains, in our search.” OK. But, why?

I can suggest why not: Because destroying a brain destroys a mind. In fact, destroying only certain parts of brains destroys minds. All the other cells don’t keep your mind going when your brain is gone. But you can lose all your limbs and keep your mind. I think we can be fairly certain — *very* certain — that even though we don’t understand how the capacity for sensation happens, minds happen in brains.

Motion sensors behave, computers behave, and so on. The question of sentience is, and remains, a different question. Bacteria can do some stunning things. In order to follow a gradient, a bacterial cell in a liquid, for example, must have a way of comparing the concentration of something at this moment with what the concentration was a moment or two ago. Peter Godfrey-Smith (2016) notes that a bacterium “uses time to help it deal with space ... one mechanism registers what conditions are like right now, and another records how things were a few moments ago.” And they must have a decision mechanism for maintaining or changing course.

But whether it feels like anything to be a bacterium, and if so how that happens, remains a question. Minds are evolved things. More complex creatures show behaviors consistent with having more complex minds. Godfrey-Smith looks to the simplest cases to start asking about the “how” of evolved feeling. Does injury feel bad to an insect or a cephalopod? When injured, do they behave in ways suggesting they feel, such as nursing or resting wounded parts? Insects do not, crabs and octopuses do. Zebrafish injected with a chemical that induces human pain prefer water having a dissolved pain-killer. Godfrey-Smith notes that questions about whether a bacterium or an insect feels anything don’t have good yes-or-no answers. Consciousness, he says, crept into existence from partial cases.

I am wholly on board with Reber’s belief that minds are not the sole property of human brains. In an evolved biota, it could hardly be otherwise. (Speaking of evolution, what’s Reber’s beef with plants? Grass is vastly more complex than a bacterium. And though it doesn’t walk or swim, it tracks and responds behaviorally to light gradients. Many plants send, receive, and respond to chemical signals. They can do more than bacteria can.)

Understanding how sentience happens still requires finding it and untangling the pathway from signal to sensation. We knew this already.

## References

- Godfrey-Smith, P. (2016). *Other Minds: The Octopus, the Sea, and the Deep Origins of Consciousness*. Farrar, Straus and Giroux.
- Reber, A. S. (2016a). [Caterpillars, consciousness and the origins of mind](#). *Animal Sentience* 2016.106.
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