

# Review of: "Modern Monads: Leibniz, Continuity, and the Stream of Consciousness"

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Potential competing interests: No potential competing interests to declare.

*Modern Monads: Leibniz, Continuity, and the Stream of Consciousness*

Jonathan Edwards

This is a very interesting and thought-provoking article. Here are some comments from a mainly Leibnizian perspective intended to assist in developing the theme of the paper.

p. 2 "Russell cannot see that a perceiving soul can (as Leibniz claims) both exist as an indivisible unit, no paragraph break here] encompassing all events it will ever encounter, and yet move from one event to another as a series of perceptions."

In fact, and ironically, Russell in his *Principles of Mathematics*, does seem (briefly) to recognize something of the problem:

"The mind must not be the sum of its constituents. For if it were the sum of ~~of~~ all its constituents throughout time, it would evidently be unchanging; if it were the sum of its constituents at one time, it would lose its identity as soon as the former constituent ceased to exist. Thus if the mind is anything, and if it can change, it must be something persistent and constant, to which all constituents of a psychical state have one and the same relation. Personal identity would be constituted by the persistence of this term, to which all a person's states (and nothing else) would have a fixed relation." (POM 470)

But he thinks that terms and their relations are eternal!

p. 2: "like Descartes's pineal ^gland^."

"The problem comes when Leibniz (1714, §75-77) wants the same monad to have preexisted as a spermatocyst animalcule before the human body is fully formed and to continue as a speck of dust after death." — well, no, it continues as an animalcule with a soul and an organic body and organs in the dust, even if on a microscopic scale.

p. 7: "He also appears to see dynamic relations as fundamentally rational, implying that going from state to state is analogous to his automata performing logical tasks. These sound like temporal parts. Does an individual dynamic unit have one eternal interaction with world or is it divided into a series, each of which perhaps having a profile with tails reaching back and forth?" Arthur (2021) gives a thorough analysis of Leibniz's theory of time and causation, with an appendix giving a mathematical treatment of the theory, showing how the finiteness of states is consistent with the law of

continuity because the states are vague. This involves a hierarchy, where what is a distinct and discrete unit on one scale is seen to be divided into further units at a finer scale. This could also dovetail well with aspects of quantum theory (Heisenberg's indeterminacy "principle").

p. 9: "I suggest a pragmatic analysis, that puts aside Leibniz's quest for immortality but follows his principles." Leibniz did not really have a "quest for immortality". He explained the human soul's immortality in terms of its having memories that could be "reawakened" on resurrection. But there is nothing similar for plants and beasts, which do not have the heightened consciousness necessary for forming self-awareness on the level required for personhood, and are simply co-eternal with the world, but not immortal. At the lowest levels of sentience for monads, all they need is faculties of representation (perception) so that they are sensitive to their environment and can acquire information from it, and an ability to move from one representation to the next (requiring some active principle or force).

p. 11: "One might ask whether, since a photon's dynamics also has a wave packet form, even a photon might go through a continuous sequence of perceptions." In its own "rest frame" a photon has zero duration, so it would not temporally go through a sequence of perceptions.

p. 12: "the microscopic world contains animalcules (these days, cells)..." One type of animalcule that he would have seen in Leeuwenhoek's "pepper water" was the tardigrade—an apparently indestructible little bugger (not so much a bug, as a bugger?).

pp. 12-13: "Elsewhere Leibniz (1694) talks of action as being a property of monads rather than bodies, so should the vibration be the action of the monad?" A complex story here: the physical action is by the monad's organic body, although within the monad this will correspond to changes in its perceptions. Physical action is proportional to  $mvs$  or  $mv^2t$ —Leibniz discovered/pioneered the modern concept of action in physics, with the correct dimensions.

p. 13: "Leibniz does not make it clear whether he is proposing a soul that perceives through many vibrating membranes or one." Keep in mind that not all monads have souls: only humans have rational souls, animals non-rational but still sentient souls that can do certain basic Pavlov type reasoning, but lower monads will have mere analogues of souls.

p. 14: "Nature isn't mechanical phenomena, dammit'." Well, this does not work so well. Leibniz was an arch-mechanist: one of his criticisms of Newton was that his rival thought gravity might work through action-at-a-distance, i.e. non-mechanically (as conceived at the time). All natural phenomena could be explained mechanically, according to Leibniz. What could not was the ontological foundation which explains why mechanics works (why things are active, have energy and action), including the foundation for the laws of mechanics themselves. Like Feynman, Leibniz thought that maxi-min principles, (like Feynman's least action principle) could and should be used to explain phenomena directly when causal explanations were not easily found.

p. 15: "Collectives such as phononic modes have a two-level hierarchy of interaction. A field asymmetry, for acoustic modes of spatial directional order, brings the mode into being. This fits well with what Leibniz called an associated body, in which individual constituent molecules can change over time." For Leibniz, what are associated with souls or soul-

analogues are *organic bodies*: these are highly organized and end-directed, but also have organs. This is a biological component of his view lacking in the physical model Edwards is suggesting. The idea is that organs are the absolutely crucial link between reception of physical signals and mental processing. This is one reason that he thinks all monads, no matter how small, must possess organs.