

Turning the Tables on Physicalism: the Energy Conservation Objection to Substance Dualism as a Two-Edged Sword

Abstract

Interactionist substance dualism (hereafter ‘ISD’) is widely regarded as violating the principle of energy conservation (PEC). The aim of this paper is to show that surprisingly, this physicalist objection creates a bigger challenge to physicalism than it does to ISD, provided that the objection is formulated with an adequate version of the principle of energy conservation (PEC) and ISD allowed the full range of metaphysical options.

In a first step, I sum up how modern neurophysiology describes the neuronal formation of volitional movements. It turns out that the chain of action potentials cannot go back indefinitely, but must have a beginning in some ‘initiating’ neurons. I examine possible biochemical sites where the depolarization of the initiating neurons might be triggered, all of which require additional energy. Thus, the PEC objection - which argues that if this energy comes from a non-physical mind, energy conservation is violated - seems *prima facie* warranted. However, physicalism must likewise account for the initial triggering. The options at hand are purely physical causes - most notably random molecule collisions, sensory input and endocrinal causes - or some kind of quantum randomness, none of which seems satisfactory.

This prompts the question why ISD has been so much under attack with respect to energy conservation while physicalism went scot-free. I argue that the PEC objection often uses presuppositions which leave no room for non-physical causes of brain processes, namely a question-begging (White 2016, Plantinga 2007) and physically outdated (Pitts 2018a, 2018b) *global* version of PEC (e.g. Searle 2004, 42), and the tacit but unwarranted assumption that mind cannot carry and therefore cannot contribute energy to the physical world (e.g. Dennett 1991, 35; Flanagan 1991, 21).

In the last section, I show that ISD has ample resources to answer the PEC objection. First, I clarify that modern physics views energy as conserved *locally* and only so long as a physical system has a continuous symmetry (converse first Noether theorem); hence energy is time-independent (Lagrangian mechanics). The view of modern physics is best summed up in a modified version of BPEC (*boundary* PEC, Collins 2008).

With such a non-question-begging energy conservation principle on board, dualists can accept that the mind adds energy to the brain without being at odds with modern science. Of course, they then need to account for the source of that additional energy; possible solutions are that the mind carries energy (Collins 2011, Hart 1994), exerts a force (Averill and Keating 1981) or just creates energy *ex nihilo*, all of which are compatible with BPEC. Dualists who prefer a solution without added energy should avoid physically naïve accounts (Ducasse 1960, Broad 1937, Lowe 1992) and rather resort to quantum mechanics (QM)-based approaches. I will briefly canvass the responses by Eccles & Beck (Beck and Eccles 1992, Eccles 1994, ch. 9) and Collins (2008). The main caveat here is that QM-based approaches hinge on the disputed question regarding mental influence in quantum processes (see e.g. Wigner 1967; Halvorson 2011; Stapp 2017).

References in this abstract

- Averill, Edward, and B.F. Keating. 1981. "Does Interactionism Violate a Law of Classical Physics?" *Mind*, no. XC: 102–7.
- Beck, Friedrich, and John C. Eccles. 1992. "Quantum Aspects of Brain Activity and the Role of Consciousness." *Proceedings of the National Academy of Science USA* 89: 11357–61.
- Collins, Robin. 2008. "Modern Physics And The Energy-Conservation Objection To Mind-Body Dualism." *American Philosophical Quarterly* 45 (1): 31–42.
- . 2011. "A Scientific Case for the Soul." In *The Soul Hypothesis*, edited by Marc Baker and Stewart Goetz, 222–46. continuum.
- Dennett, Daniel C. 1991. *Consciousness Explained*. Penguin Books.
- Eccles, John C. 1994. *How the Self Controls Its Brain*. Springer.
- Flanagan, Owen J. 1991. *The Science of the Mind*. MIT Press.
- Halvorson, Hans. 2011. "The Measure of All Things: Quantum Mechanics and the Soul." In *The Soul Hypothesis*, edited by Marc Baker and Stewart Goetz. continuum.
- Hart, W.D. 1994. "Dualism." In *A Companion to the Philosophy of Mind*, edited by S. Guttenplan, Blackwell Companions to Philosophy, 265–69. Oxford: Blackwell.
- Pitts, Brian. 2018a. "Conservation Laws and the Philosophy of Mind: Opening the Black Box, Finding a Mirror." *Forthcoming*.
- . 2018b. "General Relativity, Energy Conservation, and Mental Causation: Carroll's Foundling." presented at the Philosophy of Physics One Day Conference, University of Cambridge, May 30.
- Plantinga, Alvin. 2007. "Materialism and Christian Belief." In *Persons: Human and Divine*, edited by Peter Van Inwagen and Dean Zimmerman, 99–141. Oxford University Press.
- Searle, John R. 2004. *Mind: A Brief Introduction*. Oxford University Press.
- Stapp, Henry P. 2017. *Quantum Theory and Free Will: How Mental Intentions Translate into Bodily Actions*. 1st ed. 2017. New York, NY: Springer.
- White, Ben. 2016. "Conservation Laws And Interactionist Dualism." *The Philosophical Quarterly* 00 (0).
- Wigner, Eugene. 1967. *Symmetries and Reflections*. Indiana University Press.