

"There once was a ghost who opened Einstein's office door... in doing this he thought he could disprove the conservation of energy law."¹ Did he?

The law of conservation of energy-mass has had quite an illustrious career in the debate over physicalism and mind-brain interactionism.² Leibniz, for instance, argued that "the mind cannot act physically on the body without completely disordering the laws of nature"³ in a way prefiguring the challenge as it has been articulated since his time. In our own time thinkers such as Peter van Inwagen, a Christian Materialist,⁴ have argued that mind-brain interactionism involves "a violation of well-established physical conservation laws like the law of the conservation of energy."⁵ What is the scientifically informed mind-brain interactionist to make of this objection? Of course, as Richard Bernier has pointed out, she could simply reject the law of the conservation of energy in order to afford consistency along with maintaining mind-brain interactionism, but one might hope to do better. C.D. Broad, however, in a relatively groundbreaking article, *The Traditional Problem of Body and Mind*, has argued to the effect that the mind may have causal influences on the brain in such a way that it does not violate the law of the conservation of energy. In response, James Cornman concedes the point but argues that Broad's model still violates another law, namely the law of linear momentum. Since mind-brain interactionism is considered untenable by Cornman for this reason alone, it seems that if one can dissolve this objection then they have done most of the work required to defend interactionism. This I intend to do.

Broad imagines that the argument from the conservation of energy would go something like this:

I will to move my arm, and it moves. If the volition has anything to do with causing the movement we might expect energy to flow from my mind to my body. Thus the energy of my body ought to receive a measurable increase, not accounted for by the food that I

¹ Barbara Montero, *What Does the Conservation of Energy Have to Do with Physicalism?* in *Dialectica* Vol.60, N 4 (Oxford: Blackwell Publishing, 2006) p.383

² By interactionism I will mean simply the idea that the mind has causal influence on the brain, and the brain has causal influence on the mind.

³ Barbara Montero, *What Does the Conservation of Energy Have to Do with Physicalism?* p.384-5

⁴ By a 'materialist' here I simply mean that he is a physicalist when it comes to human beings, thus he thinks the mind-brain distinction is a mistake, but of course he is also a classical Platonist about platonic forms.

⁵ Barbara Montero, *What Does the Conservation of Energy Have to Do with Physicalism?* p.384

eat and the Oxygen that I breathe. But no such physically unaccountable increases of bodily energy are found.⁶

Broad proposes an analogy to the way the mind brings about effects in the brain without any transference of energy might be found in something as mundane as a pendulum. He argues that when considering a string tied to a weight, for example, we find that "the string makes no difference to the total energy of the weight; but it makes all the difference in the world to the particular way in which the weight moves."⁷ Similarly the mind may not need to transfer energy to the brain in order to constrain how the energy in the brain 'moves'. This could be achieved, it is suggested, by lowering or raising resistance at certain synapses in the brain, which would avoid the charge of energy transfer. In response, James W. Cornman admits that Broad's argument has successfully absolved the mind-brain interactionist of the charge that her view violates the conservation principle. However, Cornman advances against Broad's account an analogous charge which is thought to be just as damning; Broad's view, Cornman suggests, violates the principle of linear momentum. He explains "any change of a system's total linear-momentum requires that some net external physical force affect the system,"⁸ adding that "the only appropriate physical forces are gravitational... and electromagnetic"⁹ neither of which would a nonphysical mind have. This allegation alone is the *point* on which Cornman erects the *pyramid* of his argument for an alternative theory.¹⁰

How stands the case for interactionism in light of such a criticism? Obviously the interactionist could simply appeal to some kind of Leibnizian phenomenalism to ground the claim that the soul can have either gravitational or electromagnetic force. However, whatever the merits of such a move, I think the interactionist can make a more impressive and much more conservative move. As Edward Averill and B.F. Keating argue, both Cornman and Broad "have used statements of the laws of physics that are stronger than is necessary to develop physics and

⁶ C.D. Broad, "The Traditional Problem of Body and Mind" in *Reality in Focus*, ed. Paul K. Moser (New Jersey: Prentice Hall, 1990), 192.

⁷ C.D. Broad, "The Traditional Problem of Body and Mind," 193.

⁸ James W. Cornman, "A Nonreductive Identity Thesis About Mind and Body," in *Reality in Focus*, ed. Paul K. Moser (New Jersey: Prentice Hall, 1990), 210.

⁹ Cornman, "A Nonreductive Identity Thesis About Mind and Body," 210.

¹⁰ One is only justified in appealing to his theory, he seems to maintain, if alternatives such as interactionism are untenable.

which are question-begging against interactionism."¹¹ They suggest that the most appropriate formulation of the principle of linear momentum is articulated by Goldstein as: "if the total external force is zero, the total linear-momentum is conserved."¹² With this definition in place one can immediately identify the problem with Cornman's objection; he supposes that if the linear-momentum in the brain is changed then it must be by reason of "some net external *physical* force."¹³ The mind may exert a non-physical force on the brain, which would not strictly be subject to the laws of conservation or of linear momentum, at least as Cornman articulates those principles. Barbara Montero, distinguishing the conservation of energy from the principle of *physical* conservation, which Cornman has conflated, has argued that the law of conservation of energy, properly articulated, would apply to "nonphysical mental forces."¹⁴ She points out that "about a century ago, Poincaré claimed that we would never reject the conservation law for energy because any apparent violation would be rectified by positing a new form of energy."¹⁵ Thus, even Einstein's ghostly visitor would fail to disprove the conservation principle, since we might for it posit a new kind of energy; "ghost energy."¹⁶ Cornman's mistake is that he has in mind the principle of physical conservation, rather than the conservation of energy proper, but this physical conservation principle is not "given to us by physics and thus cannot simply replace the conservation of energy law in arguments for physicalism."¹⁷ This principle of physical conservation makes the crucial and unwarranted assumption that "anything with energy is physical."¹⁸ Montero anticipates that one may want to define physics such that even 'ghost energy' would be subsumed into it:

Of course, if we define the physical over a true and complete physics, and take a true and complete physics to account for everything including mental energy (if it exists), then having energy would trivially suffice to make something physical. But there are good

¹¹ Edward Averill and B.F. Keating. "Does Interactionism Violate a Law of Classical Physics?" *Mind*, New Series, Vol. 90, No. 357 (1981): 103.

¹² *Ibid.* p.103.

¹³ *Ibid.* p.103 (Emphasis mine)

¹⁴ Barbara Montero, "What Does the Conservation of Energy Have to Do with Physicalism?" *Dialectica* 60 (2006): 387.

¹⁵ *Ibid.* p.391.

¹⁶ *Ibid.* p.392.

¹⁷ *Ibid.* p.388.

¹⁸ *Ibid.* p.394.

reasons to reject such a definition of the physical, not the least of which is that it makes physicalism itself trivially true.¹⁹

Furthermore, Robin Collins has argued impressively that in both quantum mechanics and general relativity "there are law-like correlations between events without energy or momentum exchange."²⁰ Thus, even if the physicalist were gratuitously allowed to define physicalism into everything in general, and thus nothing in particular, the physicalist would still find within physics that the principles of conservation or linear momentum, if they are articulated such that they are relevant to the debate over interactionism at all, admit of counterexamples known to us even in the physical realm.

In conclusion, it seems that Cornman's argument is simply too ambitious. He defines the law of linear momentum in such a way as to assume physicalism in a question begging manner against interactionism. The mind may exert some non-physical force on the brain on which these physical principles have no bearing at all, and, like Einstein's ghost, the mind would not thereby violate any principle of physics. This being well established, interactionism is absolved of the only objection against it with any serious *force*, and may therefore be plausibly adopted.

¹⁹ Ibid. p.393.

²⁰ Robin Collins, "Modern Physics and the Energy Conservation Objection to Mind-Body Dualism" accessed November 21, 2012, <http://home.messiah.edu/~rcollins/Mind-Body%20Prblm/Modern%20Physics%20and%20the%20Energy%20Conservation%20Objection%20to%20Mind-body%20Dualism.doc>

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