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The New Science of the Mind: From Extended Mind to Embodied Phenomenology. Mark Rowlands. Cambridge, Massachusetts: MIT Press, 2010, 249 pages, $35.00 hardcover.

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One of the latest labels to emerge for anti-classical (or non-Cartesian, or post-cognitivist) cognitive science is "4E." The four Es here are the embodied, embedded, enacted, and extended approaches to cognition. Since there are a number of different, and likely incompatible, lines of thought within the 4E group, more work needs to be done to articulate how the Es can and should fit together. Mark Rowlands' newest book, *The New Science of the Mind: From Extended Mind to Embodied Phenomenology*, addresses this need in a valuable way. He argues, clearly and carefully, for the thesis of the amalgamated mind, which "subsumes both theses of the embodied and the extended mind" (p. 84). The thesis of the embedded mind is rejected as being merely a claim about cognition depending causally on the environment. As such, it is not strong enough to be interesting for Rowlands' non-Cartesian project. The thesis of the enacted mind, in particular Alva Noë's sensorimotor version of it, is also rejected as being either implausible or no stronger than the thesis of the embedded mind (pp. 81–82). First I will outline Rowlands' defense of the thesis of the amalgamated mind; then I will raise some issues for further investigation.

The thesis of the amalgamated mind is true if processes which include parts of the body and the environment count as cognitive processes. But what is a cognitive process? Rowlands gives the following four conditions which are together supposed to be sufficient for a process to be a cognitive process. The process must involve information processing, the information processing must have a proper function of making information available (either to the subject or for further processing), the information must be made available by producing a representational state, and the process must belong to the subject of the representational state (p. 111). As Rowlands makes clear, the first three conditions are merely descriptive of the practice of classical cognitive science — nothing controversial there. In order to make the case for extra-cranial extension, Rowlands appeals to his previous work, a "creative reinterpretation" of J.J. Gibson, in order to argue that the manipulation of the optic array also meets the first

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three conditions (p. 122). It is then the fourth condition, the ownership condition, which needs some explaining.

Rowlands argues that the problem of the ownership of cognitive processes is a serious one, but that it is a problem for Cartesian internalists as well as non-Cartesian externalists. Traditional internalists readily appeal to spatial containment as a guide to the ownership of cognitive processes. With the help of some thought experiments, Rowlands argues that spatial containment will not suffice as a guide to the ownership of processes. Since spatial containment fails, Rowlands must provide an alternative answer to the problem of ownership. This alternative answer turns out to be both bold and original.

Rather than spatial containment, the ownership of sub-personal causal processes depends on the integration of those processes into the subject. The bold and original move is that integration is then cashed out in terms of conscious personal-level processes. Rowlands writes that "a subpersonal process is *integrated* into a subject to the extent that it, together with perhaps many other subpersonal cognitive processes, will ultimately have an impact on consciously accessible, personal-level cognitive processes" (p. 151). In the last couple of chapters of the book, Rowlands offers a constitutive account of personal level ownership that borrows from Frege as well as the classical phenomenologists. The main idea taken from the tradition is that intentionality is to be understood as a disclosing or revealing activity. Finally, Rowlands argues, using examples, that revealing "activity, by its nature, *does not stop short of the world*: it *travels through* its material realizations out to the world itself" (p. 198). With that claim, we look to have a complete argument in support of the thesis of the amalgamated mind.

There are a lot of details that are worth attention in this argument. Here I will restrict the discussion to two related issues, which I take to be relatively important. The first important issue can be found in Rowlands' giving such a central role to conscious-level processes, claiming that the new science of the mind ought to include conscious availability as a way of identifying cognitive processes. Historically, the sciences of the mind have had a notoriously uneasy relationship with conscious-level processes. Cognitive science has happily progressed for decades in deliberate avoidance of consciousness. If integration into conscious-level processing is part of the sufficient condition for a process to be cognitive, then it is not clear whether cognitive science can continue to keep its distance from the science of consciousness. It is also unclear whether the new science of the mind, as conceived by Rowlands, should appropriate newly established experimental paradigms in consciousness science, such as those used in the search for neural correlates of consciousness. In any case, I suspect that those who think it is a good idea to keep cognitive science distinct from consciousness research may not be friendly to Rowlands' position. On the other hand, perhaps embracing consciousness is the right price to pay in exchange for this new science of the mind — maybe a science of the mind is unacceptably incomplete without including consciousness.

The second issue I want to mention is that Rowlands' position is not allied with either of two major 4E factions, namely functionalism and enactivism. Roughly characterized, the functionalist is not interested in the particular material implementation of mental states. What matters is the functional role played by those states, not the stuff of which they are made. This kind of functionalism lies behind Andy Clark's commitment to the extended mind. In opposition to functionalism, there are those within the 4E camp who think that the biological details are important. The enactivism of Varela and Thompson, for instance, emphasizes that minds emerge from living things, and that living

things are self-maintaining dynamical systems. These two positions — functionalism and biological enactivism — look to be incompatible. Where does Rowlands fall here? On one hand, he claims that his position is not incompatible with functionalism (p. 105). On the other hand, a central feature of his argument is "that any process that is to qualify [as] cognitive must belong to an *organism* . . ." (p. 146, emphasis added). If we take "organism" to mean a living thing, then this claim turns Rowlands away from functionalism and towards biological enactivism.

A clear stance from Rowlands on the issues of functionalism and enactivism could help clear up the worries about how his project is supposed to fit with the natural sciences. Functionalism and enactivism both understand cognition in terms that are at home in the natural sciences. For functionalism, functional role is important, and for enactivism, the self-maintenance of living things is important. It seems that Rowlands, in contrast, understands cognition primarily in terms that are not at home in the natural sciences, in terms of consciously accessible personal-level processes (p. 119).

There is a strong appeal to the amalgamated mind. It is not unlikely that consciously accessible personal-level processes play a large role in our intuitive understanding of cognition. What remains to be seen, though, is how exactly consciously accessible personal-level processes can play a role in the new *science* of the mind.