Neither Brain nor Ghost: A Non-Dualist Alternative to the Mind-Brain Identity Theory, by W. Teed Rockwell. A Bradford Book, MIT Press (Cambridge, Mass.), hard cover 2005, paper edition 2007. 231 pp. $20.00 (paperback) ISBN 978-0-262-18247-8.

Radical Embodied Cognitive Science, by Anthony Chemero. A Bradford Book, MIT Press (Cambridge, Mass.), 2009. 252 pp. $30.00 (hardcover) ISBN 978-0-262-01322-2.

Eighty-five years ago in his major work *Experience and Nature*, the American philosopher John Dewey wrote the following:

> **"At every point and stage...a living organism and its life processes involve a world or nature temporally and spatially "external" to itself but "internal" to its functions."** (Dewey 1925, p. 278)

This succinct idea carries within it the originating premise of the Hypothesis of Extended Cognition (HEC) and the Hypothesis of Radical Embodied Cognition (HREC), cutting-edge theories of cognitive science held by W. Teed Rockwell and Anthony Chemero respectively. The argument is that the world outside the body does not consist merely of *objects of* cognition; instead, these "external" factors are *internal to the self*: As such they are functional elements of any cognitive system and are indispensable to such systems. In other words, the dominant paradigm of the nature of mind and cognition is called into question.

HEC and HREC reject the mind-brain identity theory (MBI). Consciousness resides instead in a dynamic field that includes the brain, the body and the world: "Even the most private, subjective, qualitative aspects of human experience are embodied in the brain-body-world nexus." (WTR p. 158). Rockwell refers to this as a "behavioral field." He pulls no punches when it comes to following out this hypothesis to its inevitable conclusion: "At any given time, there is a region within my world... within which everything is ready-to-hand for me...And this region, I maintain, is *me* in the most unambiguous sense possible." (WTR p. 106).

This *region* (which is on that theory a person) does not include the entire world. It has flexible boundaries depending on the range of activities and interests marking out the interrelations of an individual brain-body system with the world. (WTR p. 107). Since it is a dynamic field of processes, Rockwell and Chemero both believe it may be theoretically described by means of Dynamic Systems Theory (DST). Rockwell sketches the main outlines of DST, and Chemero's book goes into greater technical detail on this point.

As the entire discussion resides in a fomenting interface between philosophy and cognitive science, it is desirable to recall what issues, scientific and philosophical, lie in the background .

1. Critique of Presuppositions in Cognitive Science

Rockwell and Chemero argue that the field of cognitive science abounds in the design of experiments and interpretations of experimental results based on presuppositions that do not stand up under serious analysis. Rockwell presents multiple examples of these sorts of difficulties

beginning with pointing out the impossibility of separating the cognitive role of the brain from that of the nervous system as a whole.

The theoretical separation of the brain from the nervous system assumes that the brain is a CPU-like controller, while the rest of the nervous system functions merely as sets of convenient cables carrying input to the brain. It is in the brain where actual cognitive functions take place, in the form of computational manipulation of representations of the outer world – what Chemero refers to as "mental gymnastics."

The brain-as-CPU theory is what would be left over after Descartes' idea of a disembodied soul mysteriously connected to the brain is disavowed. Rockwell refers to this as Cartesian materialism. Rockwell cites researcher Patricia Churchland as asserting unequivocally that the "mind is the brain" (P.S. Churchland 1986, p. ix); then Rockwell shows that actual research results as well as interpretations by researchers do not support the separation of the brain from the rest of the nervous system with respect to cognitive functions. (WTR p. 23)..

Rockwell's ultimate goal is to show that just as one cannot draw an absolute line between the brain and the rest of the nervous system, or between the brain-plus-nervous system and the body as a whole, so it is not possible to make a valid separation of the brain-body system from the world. In the course of his effort he constructs a variety of fictional scenarios illustrating some point or other about what we do or do not mean by key concepts in use in interpretive conclusions. Thus we find him talking at length about "zombies," "pink ice cubes," and "twin Earths," in scenarios which may strike impatient (non-philosophical) readers as absurd, tedious or simply irrelevant because of references to impossible situations.

However, such philosophical excursions are sometimes necessary to make a point. Rockwell is struggling here against bias among mainstream cognitive scientists (as well as many in other fields and even in the general public, where MBI is commonly accepted). So he takes the risk of seeming too esoteric and repetitive in favor of a very real need for persuasion in a matter that in essence demands a paradigm shift across the whole spectrum of our understanding of mind.

One more direct analysis that Rockwell provides is his chapter on "Causation and Embodiment." Here he undertakes a careful critique of views of causality in relation to cognitive science. Rockwell points out that "Because there are many crucial things happening in the brain every time we feel or think, neuroscience naturally assumes that brain activity is the sole cause of mentality." This assumption, he notes, is because "the goal of neuroscience is to discover the brain events that participate in the causal nexus responsible for mental events." The common assumption is that those brain events are the *sole cause* of their mental correlates – the conclusion being that the mind resides wholly in the brain. (WTR p. 54).

Rockwell maintains that the notions of *atomistic causality* and *intrinsic causal powers* both support the dominance of Cartesian materialism in cognitive science. Atomistic causality proposes that "a single event produces a causal relationship with another single event, and this connection could be completely independent from any other fact in the universe." On that view, single events in the brain would stand in a direct causal relation to some single mental states. Against this Rockwell cites Mill as holding that "causes cannot be separated from their context of conditions."

Rockwell's point is well taken. Interpretations of results in neuroscience research abound in examples of such separation. Any portion of the brain that is active during some process, such as remembering, is automatically identified by the neuroscientist as the sole cause. Typical interpretations are that the "memory" is "encoded" in the active region of the brain.

However, even if atomistic causality is eschewed, it could still be argued that the brain is a

system that itself possesses intrinsic causal powers. (WTR pp. 55-57). Against this Rockwell argues that causal properties are "fundamentally relations, not monadic predicates." Rockwell concludes that "the causal nexus that is responsible for the experiences of a conscious being is *not* contained entirely within the brain of that being." (WTR p. 58, his italics). This sort of holistic position, repeated many times over with respect to different aspects of MBI theory, is well represented and constitutes a substantial portion of his book.

In critiquing the presuppositions inherent in much of mainstream cognitive science, Anthony Chemero takes a more direct approach. He describes a flawed logic, which he refers to as "Hegelian argument" (After the philosopher G. W. F. Hegel, 1770-1831). Hegelian arguments begin with a set of premises based on some predetermined conceptual framework without empirical foundation, and then conclusions are drawn from those premises contrary to empirical evidence. Hegel's argument, for example, was to prove that "no eighth planet can be discovered." (Chemero might include among such arguments the one sometimes attributed (perhaps falsely) to Aristotle, to the effect that flies must have four legs because two is not enough, three is an imperfect number, and more than four are unnecessary.)

At any rate, Chemero points out that most philosophers and scientists are wary of such conceptual arguments, but that "...this attitude has not made its way into cognitive science, where conceptual arguments against empirical claims are very common." Chemero goes even further. He says "Indeed, one could argue that the field [of cognitive science] was founded on such an argument." (AC pp. 4-6). In other words, he holds that there is something *fundamentally* rotten in the state of cognitive science.

Chemero's first illustration of this claim is to show how a key argument of Noam Chomsky's commits this logical blunder. Chomsky's argument is "the first in a string of Hegelian arguments in cognitive science." Among these is the "systematicity argument" set forth by Fodor and Pylshyn (1988) which Chemero characterizes as "one of the most important and influential in the recent history of cognitive science."(AC pp. 7-8). Chemero's discussion of such logical flaws, which seem to amount to a kind of intellectual disease, is all the more powerful because of the clarity of organization and expression with which he presents his analysis.

Next Chemero strikes at the heart of the matter by explaining what makes the HREC alternative, in broad opposition to MBI, *radical*. HREC carries the tenet of HEC that cognition resides in dynamic brain-world-body systems a step further by denying that cognitive processes within such systems operate by manipulating *representations* of the world. Thus to the degree that cognitive science is "representationalist" (and hence computational) it is on the wrong track. Formally, HREC is expressed as the claim that the tools for explaining embodied cognition, which include DST, do not require the positing of mental representations.

Chemero represents this view as descending from American naturalism as exemplified by Dewey and James, and from Gibsonian ecological psychology. These he says are *eliminativist* views (i.e. inner representations are eliminated from theory of cognition). (AC pp. 29-30). Although HEC also invokes the brain-body-world nexus, HEC still may embrace some form of representationalism, and would thereby be committed to a form of computationalism in that cognitive activity is seen as manipulation of representations, but occurring somehow within a brain-body-world nexus rather than in the brain alone.

2. Philosophical Considerations

Rockwell's book has as its subtitle "A Nondualist Alternative to the Mind-Brain Identity Theory." Rockwell rejects Cartesian dualism, but he also rejects Cartesian materialism, particularly its extreme form, "eliminative materialism." This is the view that all so-called mental activity is nothing more than physical states of the brain, and therefore "there are no such entities as thoughts or sensations, and never were." Those who think they possess a mind, or are a conscious thinking self, are suffering from a kind of illusory "folk psychology."(WTR p, 5).[1]

One might wonder what form of madness could bring such seemingly adept thinkers as Paul Churchland (1989), as cited by Rockwell, to adopt such a view. In effect anyone who espouses eliminative materialism is *denying his own denial*. It is, in fact, a separation of oneself from oneself, and is one of the adverse results of the dualistic view. Once a single absolute separation of one element of experience from another is accepted, the world *shatters* to the extent that a person cannot understand either who, or where, or what he or she is. This is a psychological concern and is not limited to theoretical issues in cognitive science. Ecological psychologist Robert Greenway, for example, refers to dualism as the "radical wound" caused by "distinctions that become disjunctions." (Greenway 2009). If this dimension of the discussion is taken into consideration, to the degree to which cognitive science abets and perpetuates a dualistic separation of mind from world, it is on negative *ethical* ground.

From this standpoint it is unfortunate that Rockwell's book makes no mention of this broader socio-psychological context. There is a suggestion of this context in Chemero's final chapter on the metaphysics of HREC, but it remains within an abstract philosophical discussion rather than that of an existential malaise. The fundamental reason for denying representationalism should be, in this present writer's opinion, that once the psyche of an individual personality is collapsed into the sphere of computational manipulation of pictures of the world, there is no longer a lived world, and the relation between an individual and his or her milieu can become destructive – so much so, in fact, that we have the absurdity of the eliminative materialist denying his own denial even as he is denying it.

Here we crash head-on into a problem with both HEC and HREC. The following questions raise their unpleasant countenances: First, whether "having" representations is the same thing as having a mind. Second, whether eliminating representations amounts to the eliminative materialist view that our sense of having a mental life of any sort at all is simply an illusion. Third, whether it makes any sense at all to talk about "representations" being "embodied" by either a brain *or* a brain-body-world dynamic system (choose whichever you prefer).

The competition between representationalist and nonrepresentationalist views of cognition is a rather loud echo of the kinds of philosophical clashes found throughout the history of both philosophy and science, such as that between nominalism and realism, rationalism and empiricism, or indeed the clash of form and matter. Is mind reducible to physical states of the brain, or of the brain plus body, or of a brain-body-world dynamic system, such that within any such system there exist, or do not exist, substructures that somehow "represent" other structures "outside" the system?

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[1] The question arises as to why this reduction of "mind" to nothing but physical substance does not qualify as *nondualistic*; Actually eliminative materialism is not a genuine nondualist philosophy, because instead of reconciling properties of mind with those of matter, it simply denies the existence of mind in any recognizably ordinary sense. The aim of a nondualistic view is to *reconcile* consciousness with matter.

And can any such physical system *be a mind* and not contain within itself any representational structures at all? This opens a philosophical/scientific Pandora's box, which both MBI theorists and HEC/HREC advocates are going to have a great deal of trouble shutting, if that is even possible. (At the risk of mixing metaphors I'm tempted to start talking here about the Sorcerer's Apprentice, but let be).

The undermining presence of issues like those above are revealed at once. In Rockwell's discussion we have a confusion of terminology about what it means to say a *mind* is *embodied* in a physical system. There are two difficulties here: the first is how "mind" is adumbrated, and the second is how "embodied" is understood. On just two pages Rockwell characterizes mind as "mental properties," "mentality," "a mental system," and "mental processes." So is mind a quality (mentality), a process, a property, or a system, or all of them at once? But as things go on, the favored characterization of mind is that it is constituted by a *set of properties* which might also be termed mental states.

Thus Rockwell refers to "our visual mental states," by which he seems to mean something like "having a visual perception" or perhaps just "seeing something." Included also are thoughts and beliefs, "knowing or remembering a fact about the world," and so on, all of which either constitute the mind or are properties of a mind, or are properties of either the brain or a dynamic brain-body-world system, such that we say one or the other of these is, or has, a mind. (WTR p. 71).

Now there is a reason that Rockwell shifts from (infrequently) talking about a mind to (frequently) talking about sets of properties. This is because of his concept of what it means to say that mind is embodied. He seeks to resolve the question of dualism by determining how we can contain the concepts of mind and body in a single system. This must perforce be a physical system "embodying" a mind, the latter seen as a set of properties. But these cannot be physical properties, else we are committed to eliminative materialism. They remain mental properties – sets of properties of a peculiar sort called "mental."

The underlying reason for this very sticky philosophical position, which avoids the question of how any set of properties constitutes the mind of a conscious self, is that Rockwell believes the problem is solved by invoking the concept of "supervenience," which is admittedly a "scrupulously downsized technical term with some similarities to both causation and identity." (WTR p, 69).

Thus if it is understood that the mind *supervenes on* the body, according to Rockwell the problem of dualism is resolved. And supervenience, in turn, has to do with sets of properties. So the convenience of supervenience is to view the mind as a set of mental properties, and then assert that these supervene on a set of physical properties. By definition this entails that any two individuals that are indistinguishable in their physical properties must perforce exhibit identical mental properties, and if two individuals possess different mental properties, they must also have different physical properties. But the relation is not symmetric: Two individuals may have the same mental properties but differ in their physical properties.

The relation of supervenience may cogently be asserted of certain kinds of physical situations. For example it may hold of relations between the acceleration, velocity, and position of an object in space. But there are two problems with the assertion of supervenience as the relation between sets of mental properties and sets of physical properties. The first is that it is empirically impossible to determine whether it is true that "any two individuals indistinguishable in their physical properties have identical mental properties," because there *are* no two individuals who are indistinguishable in their physical properties – their fingerprints alone will testify to this (not to speak of DNA).

What Rockwell really has here is a premise, namely the premise that the relation of mind (as mental properties) to body (as physical properties) is that of supervenience. And that premise is purely conceptual with no empirical foundation. Any arguments Rockwell presents as following from such a premise are instances of Chemero's Hegelian arguments. Bluntly speaking, the invocation of supervenience as a solution to the mind-body problem is nothing more than a piece of philosophical thaumaturgy.

The second problem, which really brings us to the nub of the matter, is the use of the term *individuals* in the definition of supervenience. The utterly devastating difficulty of the entire enterprise has to do with the way it systematically uses, but systematically discounts, the nature of the self. For how do we determine if two individuals have, or do not have, the same properties, unless we presuppose that they are indeed individuals? And presumably to be individuals, it must be predetermined that they have minds.

So, for example, if we say that "the mind is a set of mental properties," we have committed a logical mistake, because to know that a property is mental we must already know that it is a mind that has those properties. We have already encountered this difficulty in Rockwell's statement of what it is that he thinks he is. When he says "there is a region within *my* world in which *I* am engaged ...and this region, *I* maintain, is *me,*" he presupposes that he is a *self* who can formulate hypotheses as to what he is (my italics). It is significant that Rockwell very seldom mentions "self" in his discussions but prefers to focus on mental properties instead.

A related case appears in Chemero's discussion of direct perception. He introduces the "problem of two minds" which arises when perceptions are direct, rather than mediated by internal representations. The problem is that if two separate individuals A and B *directly* perceive the same object X, the object will be part of both A's perception and B's perception, and thus at odds with the assumption that minds are private. The peculiarity arises when Chemero *agrees* that the minds involved must be private, and argues that since perception is a relation, and since the relations of A to X and B to X are different, so their perceptions "do not overlap." Chemero is therefore unwilling to give up the alleged privacy of minds – but at the cost of now having two X's, the X that A perceives and the X that B perceives.

The problem here is the reverse of that in the Rockwell case. Instead of not taking into account the role of self in defining mind and consciousness, Chemero posits that selves are "private" and hence cannot share an object of perception with any other individual, on the ground that any perception is a unique relation between an observer and a thing observed. But this is to render meaningless the entire enterprise of extending, or embodying, the mind into a system of interactions between brain-body and world, because the things in the world that are part of any such system are necessarily shared by multiple overlapping systems. Indeed, the very possibility of such human experiences as those of empathy, friendship, knowledge of others and love, depend on some sort of shared, not private, self. Neither the privatized self implied by Chemero, nor the self-as-bag-of-properties advocated by Rockwell, can satisfy this profoundly necessary requirement.

The upshot of this discussion is that the less philosophy of mind occupies itself with the technological details requisite for creating an simulated intelligence, and the more it remains sensitive to the full spectrum of human experience, the better. The advocated use of DST in cognitive science may indeed have useful results of a certain limited sort; but it will almost certainly not solve the problems that center about the nature of the self and the presence of dualism in culture and psychology.

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