

Book Reviews

Frederick Adams and Kenneth Aizawa

The Bounds of Cognition

Blackwell Publishing, Malden, MA, 2008, 197 pp.

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Reviewed by Max Velmans, Goldsmiths, University of London

What are the boundaries of human cognition? Conventional wisdom in psychological science tells us that human cognition takes place within the confines of the human brain. Cognitive psychology does of course accept that the brain is embodied and that the human body is in turn embedded in a surrounding physical and social world. It also goes without saying that, in order to operate effectively, cognitive processing in the brain must be influenced by and initiate causal interactive chains that extend beyond the body into the external world.

But does that mean that cognition itself extends beyond the brain and into the world? Over the last decade or so, a sizable literature has emerged (largely from philosophy but including a few psychologists and cognitive scientists) to argue that it does, defending what has come to be known as the *extended cognition* or *extended mind* hypothesis. Adams & Aizawa take a cool look at this literature to tease out the claims, evaluate the arguments and assess their significance.

According to the authors, arguments in favour of extended cognition come in one (or a mix) of five basic forms: (1) The existence of *causal connections* between the brain, body and external world are grounds for treating the connected aspects of body and external world as cognitive; (2) Causal connections between brain, body and external world form an extended *cognitive system*, and in this sense, cognitive processing is not entirely in the head; (3) There are examples of processes that span the brain, body and external world that are in all relevant respects just like cognitive processes that occur entirely in the

head. If these are equivalent, the former must be examples of extended cognition; (4) Some cognitive processes are made more effective by the use of external devices (for example, the use of pencil and paper in mathematical calculations). If cognition is improved by such extensions, it can be argued that these extensions are part of cognition; (5) Evolution by natural selection ensures that given features of cognition are adapted to work in conjunction with given features of the environment. If so, one can argue that those environmental features are really a complementary part of the cognitive apparatus of the mind.

Taken in a weak or metaphorical sense, these arguments would ruffle few feathers in the cognitive psychology establishment. However, much of the extended cognition literature is intended to be revolutionary. The default assumption in cognitive psychology is that cognitive processing largely takes place within the brain. Although there are causal dependencies that extend out into the world, cognitive processing as such does not extend beyond the brain, and certainly not beyond the confines of the body. Adams & Aizawa cite many examples of extended cognition theorists who explicitly oppose such boundaries — for example, Clark & Chalmers (1998) who argue that cognition extends into the tools that people use, or Rockwell (2005) who claims that ‘not only thoughts, but also feelings and sensations, must be seen as supervening on the entire brain-body-world nexus’, or Gibbs (2006) who maintains that ‘Cognitive processes are partly constituted by physical and bodily movements and manipulations of objects in real-world environments’.

According to Adams & Aizawa, these stronger claims, and their supporting arguments suffer from insufficient attention to three fundamental distinctions. First and foremost, not enough attention is paid to the difference between the claim that an entity or process in the world is *causally connected* to some cognitive process in the brain and the claim that the entity or process in the world *constitutes* part of that cognitive process. As they point out, ‘The circulatory system causally supports cognition. Many humans (especially yogis) can causally affect their heart rate by thought alone. So there is a two-way causal coupling between cognitive processes and circulatory processes, but it is false that cognition extends into the circulatory system. Thought is not circulation’ (p11). They label this confusion of being causally coupled to something with constituting part of something ‘the coupling-constitution fallacy’. Examples of this in the extended cognition literature abound.

Second, there is insufficient attention to being part of a cognitive *system* and being part of a cognitive *process*. If one jots some

information down on a piece of paper in order to remember it later on, one might argue that the information on the paper is part of the overall system (of entities and processes) that enables one to remember it. But it is another matter to claim that the jottings on paper constitute part of cognitive processing as such or (even stronger) that entry and retrieval of information from paper is somehow equivalent to entry and retrieval of that information from long term memory. Entry and retrieval of information from memory is a cognitive process, but in order to retrieve the information from the paper one simply has to read it. Reading is of course also a process, but the marks on paper are subject to this process rather than being a constituent part of the process itself.

Such fallacies, they argue, are encouraged by insufficient or weak attention to what is special about cognitive processes in the first place — for example to the reasons that psychologists find it useful for many purposes to distinguish *cognitive* processes from motor processes, perceptual processes, affective processes and so on. Equating cognitive processing with information processing *of any kind* is too lax. As they note, a wristwatch is an information processor, but not a cognitive agent. Unless one can establish that cognitive processing extends into the world in the sense that psychologists usually mean by ‘cognitive’, the debate simply degenerates into a trivial dispute about how to *define* a ‘cognitive process’ in which case the conventional and extended cognition literatures will simply sail past each other like ships in the night.

The bulk of the book is then devoted to a scholarly examination of many variations of the five basic arguments for extended cognition listed above along with the ways in which they fall foul of one or more of the three basic fallacies. How well do the authors achieve their aims? As a psychologist, I sometimes wished that the authors had linked their analysis a little closer to the cognitive literature: for example, they give their own definition of cognitive processes in terms of mechanisms that operate on ‘non-derived representations’ (representations with content that is not derived from other representations) which seems at first glance to be rather obscure, particularly as they make no mention of the closely related (and much discussed) ‘symbol grounding problem’ in cognitive science (the problem of how the content of representations in cognitive systems get to be connected to or grounded in the world). Generally speaking however I found their discussion of ‘cognitive processing’ true to how cognitive psychologists usually apply this term, and their critical analysis of arguments for extended cognition well-founded.

What to make of it all? There is little doubt that the flurry of recent interest in how cognition is embodied and embedded in the world has been useful in generating a renewed interest in sometimes neglected relationships, for example, in the study of ‘situated cognition’, where simple cognitive devices, well-adapted to their environment can achieve tasks that otherwise would require extremely complex internal processing. One of my favourite examples of the way brain-body-environment interactions might simplify internal processing comes from studies of inattentive and change blindness. Studies of inattentive blindness such as Simons & Chabris (1999), for example, suggest that we do not see what we do not attend to *even when we are directing our gaze at it*. Equally surprising, studies of change blindness such as Simons & Levin (1998) demonstrate that we do not notice *major changes* in what we are gazing at unless fast transitions capture our attention, or we happen to be focusing our attention on the precise features that change. Taken together, such findings provide persuasive demonstrations that what we notice about the perceived world is less complete and detailed than we usually think. The findings also challenge a commonly held view within psychology about how perception works, namely that we have a detailed, and complete inner representation of the external world built up over successive eye saccades out of the degraded information arriving at the retinas. If such a complete representation were updated moment-by-moment, then we should notice changes in the visual field by comparing current input with complete records of the world developed from prior input — but we don’t.

The alternative, interactive view suggests that we perceive perhaps 5 to 6 features of the world at any given moment (wherever we gaze) but we are free to pick up any other features, as we need them, by exploring the world (e.g. with eye movements). The reason we think that the visual world is rich in detail and colour is because the world itself does have this detail and colour, and we see this wherever we look. We do not need to build up a complete, detailed inner representation of the world because the world itself stores all the relevant information. Whether or not this is a true case of ‘extended cognition’ I will leave to the reader to judge.

And what of conscious experiences themselves? Many experiences have apparent location and extension either in the body or the external world — which forms a central point of departure for competing theories, including reflexive monism, projectionism, radical externalism, transparency theory, and some versions of biological naturalism. The authors do give critical consideration to Noë’s (2004) sensorimotor

theory of perception which associates experiences with sensorimotor knowledge and activities, but otherwise they give this matter scant attention. For example, they quickly dismiss Rockwell's (2005) suggestion that pain might actually be realized in the body as 'radical'. But being radical does not make a suggestion wrong. A pain in the foot certainly appears to be in the foot, and the pain experience itself cannot be found in the brain, viewed either from a first- or third-person perspective. The typical reason for assuming (contra the phenomenal evidence) that the pain is really in the brain is that the proximal *neural causes and correlates* of pain are in the brain. But, ironically, this commits the very same coupling-constitution fallacy that Adams & Aizawa point out so clearly (applied to other matters) in their analysis.

Such caveats aside, this is a well written, well argued book. Written by philosophers mainly for philosophers it provides conceptual clarification of many extended cognition claims in ways that philosophy, at its best, does best. In so doing, it makes a serious contribution to the extended cognition debate that anyone with a serious interest in this issue needs to study.

References

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Galen Strawson

Real Materialism and other essays
 Oxford: OUP, 2008, 478 pp. £65.00
 ISBN 978-0-19-926742-2 (hbk)

Reviewed by John Dance

The 19 essays gathered in Galen Strawson's latest book were written over a period of roughly 20 years and are related thematically. Strawson asserts, in the Introduction, that *philosophy is one of the great sciences of reality* and has *the same goals as natural sciences*. He agrees that, while the methods of philosophy are different from those of the natural sciences, their domains of discourse overlap. It comes as no surprise then that the lead essay, from which the title of

the collection is taken, argues for a strong-materialist view about the nature of reality and Strawson adopts what may be considered the common-sense view that reality is composed of matter and is entirely concrete and physical¹.

The 'ground plan' of the collection is reasonably clear. The first three essays are devoted to establishing the basic metaphysical position². The others explore some of its implications and should be of particular interest to readers of *JCS* since many of them are about related topics such as qualia, experience, intentionality and the self. Strawson's views are thought provoking and controversial while his approach is frequently contentious. I particularly enjoyed his characterization of the 20th century as 'the silliest of all centuries, philosophically speaking'. This remark, in the Introduction, together with the use of the word 'Real' in the title, sets much of the tone. But there is a good deal more here than polemic; generally, I find much to agree and sympathise with in this book.

Strawson starts by discussing what it is to be a 'real' materialist — one who follows through the logic of the position. By 'matter' Strawson means that which can be spacio-temporally located and is controlled by 'objective forces' (ie. the fundamental forces of nature — I take it Strawson means such phenomena as gravity). However in doing this Strawson comes to some unusual conclusions about the nature of the 'mental' and the way in which a rigorous materialism entails panpsychism. The second essay, on Realistic Monism, explores this notion and readers of *JCS* will be familiar with the arguments³. Suffice it to say that, while the panpsychist pill may be hard to swallow, the logic of the argument is compelling. The third essay completes the exposition of the materialist thesis by arguing that we can apprehend the nature of (non-mental) reality directly — 'as it is in itself'.

From this metaphysical foundation he goes on to discuss (essays 4 to 6) experience and 'qualia'. The general idea here is that our experiences are real experiences of real objects 'out there' and provide us with real information about them — a view that some philosophers are reluctant to accept but which follows naturally enough from Strawson's materialism. Essays 7 to 11 discuss intentionality and the self, arguing against narrative theories in favour of an episodic one.

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- [1] Strawson seems, indifferently, to call this view Materialism, Physicalism or Naturalism.
- [2] The fact that Strawson considers himself a 'metaphysician' is made abundantly clear, particularly in the final essay.
- [3] *JCS*, 13 (10–11), 2006 — the whole issue was devoted to Strawson's paper on panpsychism and reactions to it.

From here Strawson develops, in the remaining essays, ideas about human action, agency, freedom and the nature of causality. He argues that we cannot be free agents in any absolute sense because we cannot be ultimately morally responsible for our actions. This remains the case whether Determinism or Indeterminism is true, but it does *not* follow that we can't have all the freedom of action we could reasonably want. The ultimate explanation for this, consistent with the materialist thesis, is that we are bound by contingency. However, Strawson notes, the fact that there is no such thing as complete freedom does not prevent humans from either yearning for it or actually believing they have it. This phenomenon, far from being futile, has historically led to valuable social and cultural outcomes. This kind of analysis of freedom is of course well known. Equally Strawson's views on causation, which demolish the absurd view that what we call 'causation' is nothing more than regularity, now seem fairly orthodox.

I should say, however, that the good things in this collection are not always easily come by. A body of work that was produced over a 20 year period will generally need substantial editing if it is to present as a coherent whole. The difficulties of doing this are endemic to such compilations, and while Strawson achieves a good deal, he makes large assumptions about his readership and there is, inevitably, considerable repetition. The main problem, though, is that of context. These essays all seem to have been written as contributions to technical debates about specialised philosophical topics and Strawson, by the very act of publishing them together in the current volume, appears to be making the assumption that his readers can supply the missing background. A good example is to be found in essay 17 (about theories of causation). To appreciate fully what is going on here the reader needs have read an earlier book by Strawson (1989) plus a paper about that book by Everitt (1991). Elsewhere there is an esoteric discussion about what Hume may or may not have meant by the word 'unintelligible'. More importantly Strawson makes it rather difficult for his readers to find out exactly what he means when he describes reality as 'concrete' in essays 1 to 3. Definitions of these terms *are* to be found — but the reader has to go to essays 11 (in a footnote!) and 16. Again, while it is clear from the structure of the book that everything flows from the thesis on materialism, it is rarely spelled out just how this is so.⁴

[4] For an example see the throw away comment about the relationship between ultimate moral responsibility and Einstein's theory of special relativity on p 380. But compare also essay 6 which tackles the issue more directly.

On the whole, though, these essays hold together well as a substantive body of work and I do not wish to suggest that this is inaccessible to any but professional philosophers. One of the legitimate tasks of philosophy is, from time to time, to step back from the technicalities and look at the bigger picture. Philosophy needs to earn its keep by occasionally telling us, the wider public, something understandably helpful about the world we live in and suggesting how we may better organize our lives. Superficially it may not seem that such is Strawsons's current project; however deeper reflection contradicts this view. Rather, I would suggest that it is a book which demands effort. But it is a rewarding effort for, overall, it gives a clear, rational and sympathetic picture of humanity's place in a wholly material reality.

References

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Søren Brier

Cybersemiotics: Why Information Is Not Enough!

University of Toronto Press, 2008, 497 pp.

ISBN 978-0-8020-9220-5

Reviewed by Gary Fuhrman

A transdisciplinary enterprise such as 'consciousness studies' must try to build bridges between the 'two cultures' of science and the humanities, but the challenge is huge. In *Cybersemiotics*, Søren Brier offers a 'unified conceptual framework' capable of advancing our understanding of cognition, communication and meaning — 'a metascientific framework which is also meta to the humanities and the social sciences' (p. 7). Brier is professor in the Semiotics of Information, Cognitive and Communication Science at Copenhagen Business School's department of International Culture and Communication Studies (which is attached to the Centre for Language, Cognition, and Mentality). He is also Editor-in-Chief of *Cybernetics and Human Knowing*, another transdisciplinary journal published by Imprint Academic.

Brier uses Norbert Wiener's term 'cybernetics' to denote the whole tradition of 'information science', up to and including 'cognitive science'. Although 'paradigms of information are crucial to our understanding of self, consciousness, communication, and our relationship with nature (ecology and evolution)' (p. 21), Brier argues that

'information is not enough'. He explains, as others have, how the 'information processing paradigm' lends itself to disembodied or mechanistic models of cognition. But he also considers the contributions and limitations of a broad range of thinkers who have tried to rehabilitate, supplement or complement that framework, and thus to accommodate the experience of meaning.

Heinz von Foerster's 'second-order cybernetics' invites us to observe the scientific observer. Gregory Bateson's quest for the 'pattern which connects' led him to redefine 'information' as 'a difference that makes a difference'. The 'autopoiesis' theory of Maturana and Varela, which introduced the concept of self-organization at the cellular level, rejected the very idea of 'information' in favour of 'structural coupling' and worked out some of the cognitive implications; Niklas Luhmann later extended this approach into the domain of social systems. Jakob von Uexküll's pioneering work in the biology of meaning bore fruit in ethology (through his students Lorenz, Niko Tinbergen and Brier's teacher Iven Reventlow), and later in biosemiotics. Meanwhile the emerging sciences of complexity, non-linear thermodynamics and dissipative structures (Prigogine) have supplemented classical mechanics with the new physics of self-organizing systems. On the philosophical side we have Lakoff and Johnson's 'embodied cognitive semantics', Wittgenstein's *Lebensform* and 'language games,' and the phenomenology of Husserl, Heidegger and Merleau-Ponty (and Evan Thompson, whose *Mind in Life* I reviewed — *JCS*, 14 (12), 2007). Despite the relevance of these advances, Brier maintains that even if we cobble them all together, they don't add up to the single conceptual framework that we need. For the unifying vision that breathes new life into the dry cybernetic bones, Brier turns to the *semiotics* of Charles Sanders Peirce.

Peirce's semiotic thinking grew out of his studies in logic, but is far more comprehensive than either 'logic' in its formal, restrictive sense or 'semiotics' in its narrow Saussurean sense. It is also grounded in phenomenology, but of a rather different kind from the Husserlian tradition. In order to appreciate this, one needs to grasp how the three Peircean 'categories' or 'elements' of experience find their full expression in the triadic nature of signs. I can do little more than mention this here, but Brier has taken a major step toward resurrecting the soul of Peirce's work (rather than lifting bits and pieces from his dismembered corpus as some specialists have done). With this book Brier not only takes a prominent place within the emerging field of biosemiotics, but also demonstrates the wide scope and the deep unity of Peirce's philosophical system.

As a professional scientist and mathematician whose main concern was the *logic* of inquiry, Peirce understood the limitations of what he called the 'special sciences', especially when they lose sight of their own place in the larger scheme of things. He recognized that larger scheme as evolutionary and semiotic to the core, the universe itself being perfused with signs. Self-consciously logical thinking develops out of nonconsciously inferential processes such as perception, and the laws of nature themselves are evolving from an original chaos with a 'tendency to take habits'. This cosmology reveals the so-called 'hard problem' as based on the typically unexamined metaphysical assumption that life and mind must have somehow emerged from originally lifeless matter; Peirce proposed on the contrary that matter is just a habit-bound form of original mind. Thus Peirce places linguistic, psychological and cultural phenomena within the larger context of cosmic semiosis. Brier in turn places the 'information processing paradigm' within this larger framework by defining 'information' as 'what Peirce would have called protosemiotic processes that have not yet achieved the full-fledged triadic state of genuine signs' (p. 34). In the end Brier recognizes five 'levels of existence': 'an entangled form of causality on the quantum level'; a 'dual' level corresponding to Peirce's Secondness, will in psychology and Aristotelian 'efficient cause' in physics; an 'informational-signal' level; a 'semiotic level'; and finally 'a linguistic-communicative causality in human conscious and social systems' (p. 438).

The book arrives at its cybersemiotic destination by 'spiralling through' the 'grand theories' (p. 14) which have laid the groundwork for it, most of them being revisited several times from different perspectives. This structure may clarify points which seem obscure at first glance, despite a risk of seeming repetitious to readers for whom this book will be most valuable, namely those who have already covered some of this ground in their own grand theorizing. On the other hand, a general reader new to this meta-discourse is likely to find it all highly abstract. Those looking for practical applications or specific examples will not find much, outside of two fairly short chapters on Library and Information Science, devoted mostly to the problems of organizing information storage and retrieval systems — a crucial task for, as the information available to us grows exponentially, the problem of how to allocate attention and channel research efforts grows along with it. Even this, however, is dealt with only in general terms. (And ironically, the book's own index is not very helpful, for instance if you've forgotten how a technical term such as 'eigenvalue' or 'hypercomplexity' was introduced earlier in the book).

Although its dearth of reference either to empirical research or to everyday experience may limit its appeal for many, Brier's book ably represents and reorganizes two decades of transdisciplinary progress. For those engaged in this kind of work it is essential reading, not only for Brier's original contributions to the reframing of cognition and communication, but also for bringing the powerful insights of Peirce to bear on these deep conceptual questions.

BOOKS RECEIVED

Mention here neither implies nor precludes subsequent review

- Ferrer, J.N. and Sherman, J.H. (eds), *The Participatory Turn: Spirituality, Mysticism, Religious Studies* (SUNY Press 2008)
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