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Book Review

Creativity Explained?

Review of Robert Arp, *Scenario Visualization: An Evolutionary Account of Creative Problem Solving*, MIT Press, 2008, 217 pp., US\$30.00, ISBN 978-0-262-01244-7

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Although it purports to tell a cohesive story, this book is really a series of digressive discussions, partly about philosophy of biology, partly about the mind-body problem, partly about the organization of the visual system, and partly about distinctively-human forms of creative cognition. This might be worthwhile if each of the components was needed for the others, but they aren't. Arp takes on far too much, and in consequence doesn't do any of it thoroughly or well.

He seems at times to be giving us an account of why we might possibly have developed the ability to think creatively, which is fine as far as it goes. That, however, is a small portion of the book. At other times, Arp seems to be claiming that his account has implications for explaining how we actually think creatively, and, more boldly, for explaining why we might have evolved to be conscious. At still others, he suggests that he might have a solution for the mind-body problem. In the end all we really get is an extended analogy between biological processes and the processes that he claims constitute scenario visualization. He argues that organisms are hierarchically organized; at every level of organization of an organism there is information selection, exchange, and integration; so too, scenario visualization is hierarchically organized, and involves information selection, exchange, and integration. But this analogy does not in any sense *explain* scenario visualization.

Ironically, Arp himself appears to suffer from a form of selectivity deficit – an inability to judge what is and isn't relevant to his claims. The first two-thirds of the book are apparently intended to lay the groundwork for what is to come. But what might have been a brief statement of the necessary commitments for his argument is instead a series of attempts to re-invent the philosophical wheel. For example, he offers the reader a discussion of the case against skepticism, and for believing in the existence of mind-independent objects. This is far too big a topic to attempt to resolve in just a few pages, and is assuredly dispensable in a book purportedly about creative thought. Although some

discussion of the organization of the visual system would (naturally enough) be relevant to his project, we get pages and pages of exposition of vision science (some of it seriously outdated), with no indication of whether or not the details matter for his purposes, or why. Indeed, he mentions quite a large number of metaphysical, epistemological, and scientific commitments. Most of these are never mentioned, or even implicitly relied upon, when he gets to the meat of his argument.

In perhaps the most egregious case of dwelling on a point that is in fact tangential to his larger argument, Arp spends the entire first chapter explaining his view on what an organism is. He claims it is “important” for him to do so, “...since conscious creative problem solving is a psycho-physiological phenomenon that is dependent upon the workings of the brain and nervous system in the human organism...” (p.11). Surely, though, it can’t be necessary to establish what an organism is in order to discuss *every* psycho-physiological phenomenon. Of course, there might well be a discussion of cognition that does require such a point to be made; however, this is not the one. After pages of examples of organisms selecting, exchanging, and integrating information, all that the first chapter can offer his project is the strained analogy mentioned above.

Chapter 2 defends a form of emergence about biological and psychological properties. But it is left far from clear quite *what* form. Thus, many would accept that psychological properties can’t be reduced to neurobiological ones, type-for-type; and many would accept that such properties figure in law-like generalizations. But still they might think that any given token psychological property or process will admit of reductive explanation in lower-level terms. Or (a closely related claim), many would think that once every single fact at the lower level is fixed, then so too are the facts at the psychological level. We get no discussion of these issues, nor is it clear whether or not Arp intends to be disagreeing with such claims. Indeed, all that his discussion of emergence seems to amount to is something like this: there are emergent phenomena and psychological phenomena seem like emergent phenomena. Without a clearer picture of how psychological phenomena emerge, however, this claim is not the contribution to the literature on the mind-body problem that the author seems to think it is.

Later in the same chapter Arp discusses the notion of function, and tries to argue that *both* the historical/selectionist account (defended *inter alia* by Griffiths, 1993, and Godfrey-Smith, 1994) *and* the current-function account of Cummins (1975) are correct. But he appears to miss the fact that the debate with which he is engaging is about how functions should be individuated. Everyone would allow that, in general, current-functions (in biology, at any rate) have historical explanations; and that most properties that have selectionist explanations also play some role in current functioning. The question is: which story is essential to biological functions as such? If there is room, here, for a conjunctive analysis of the sort that Arp seems to be endorsing (on the assumption that he really is engaging with the above debate), then he doesn’t demonstrate how it could work. Nor does he explain how the issue matters for the larger goals of the book.

Chapter 3 is an extended discussion of the organization of the visual system. As we have already noted, much of this is irrelevant for the ensuing discussion of scenario visualization in the remaining two chapters. Moreover, it is built around an outdated contrast between a so-called “what” system located in the temporal lobes and a “where” system located in the parietal cortex. Since at least Milner and Goodale (1995) the mainstream view has been that the temporal visual system is a combined what/where

system, whereas the parietal stream is a “how to” system concerned with the online guidance of bodily movement. One of the reasons this matters is that in consequence Arp is blind to the crucial role that the motor system plays in visual imagery. Indeed, strangely, Chapter 3 contains no discussion of visual imagery or its place in the visual system as a whole, nor of the role that it plays in such seemingly mundane tasks as object recognition (Kosslyn, 1994).

In Chapter 4 Arp argues that we can discern the evolution of the human visual system, culminating in a capacity for scenario visualization, in the fossil record. The chapter begins with a largely unnecessary review of the processes of natural selection and of what is known about the evolutionary development of visual systems generally, as well as giving us a quick genealogy of *Homo sapiens*. (The latter contains at least one serious inaccuracy: the author confuses *Homo erectus* with *Homo ergaster*.) The chapter then proceeds to argue that the advent of the ability to make sophisticated tools must be a sign of the coincident advent of the ability to scenario visualize. This is a mistake. Granted, we know that the makers of sophisticated stone tools must have been capable of something like scenario visualization. But this doesn't show that such a capacity was absent amongst earlier hominids and apes, for as Mithen (1996) and others have emphasized, you also need (*inter alia*) to have a sophisticated causal understanding in order to make a stone tool, otherwise you can't visualize the right point, and the right angle, at which to direct your blow. And it may be that it was this form of understanding that evolved through the relevant period, not a capacity for visualization as such. Indeed, the “insight” behaviors of chimpanzees can be interpreted as suggesting that this might be the case (Carruthers, 2006), especially if Povinelli (2000) is correct that their grasp of causal principles is decidedly weak.

In addition to the failure of its main line of argument, Chapter 4 contains a variety of statements of quite numbing banality or redundancy. Consider, for example: “it seems evident that the visual system evolved for important reasons” (p.101) and “the visual systems of the mammals from which primates evolved most likely were integral to the animal's survival” (p.101). Or our personal favorite: “tools offer us indirect – but compelling – evidence that psychological states emerged from brain states” (p.110).

Having outlined his account of the evolution of scenario visualization in the latter half of Chapter 4, in Chapter 5 Arp contrasts his views with two alternative accounts of the cognitive basis of distinctively-human forms of thinking and problem solving. One is Cosmides and Tooby's (1992) “Swiss-Army-knife” model of the human mind as massively modular in its organization, and the other is Mithen's (1996) account of “cognitive fluidity” amongst the modules in the human mind. In the course of this discussion, unfortunately, Arp makes a number of crucial mistakes. Cosmides and Tooby don't actually think that the modules in their account of the mind are encapsulated from one another, and neither do they deny the existence of various kinds of general-purpose cognitive system. And although Arp is right to point out in his discussion of Mithen that mere cognitive fluidity can't explain what is distinctive of human cognition, Mithen doesn't actually make any such commitment. Moreover, while Arp is correct that what is needed is a set of actively driven cognitive processes, he never follows this up with the necessary analysis of the structure of motor cognition (about which quite a bit is known – see Jeannerod, 2006), or of the ways in which motor cognition could be used to drive other forms of thinking and reasoning.

Indeed, the book suffers from its overly narrow focus on visual creativity alone. Although the author acknowledges that there are other types of creativity, and modestly claims he is only marking out for himself a limited territory, he goes to some length to defend his exclusive focus on the visual, saying, for example, “future planning is nothing other than the generation of visual images... and the projecting of these images into possible visual scenarios for the purpose of achieving some goal” (p.130). This is unfortunate, for a couple of reasons. One is that it ignores the role of creativity in language production (stressed over the years by Chomsky, *inter alia*), as well as creative action-selection (think here of “on-line” improvisation in jazz performance), together with the role that such productions might play in other forms of thinking and reasoning. The other is that Arp doesn’t even raise the interesting question that becomes salient when one notices the multiplicity of forms that creativity can take – viz., are these different kinds of creative cognition distinct from one another, or are they all manifestations of a single underlying creative capacity? It is plausible to posit the latter, and that the underlying capacity in question is creative motor-schema activation, which drives the production of creative images in all three domains of vision, speech, and motor-imagery (Carruthers, 2007). At the very least, some discussion of the relationships between creative visualization and other forms of creative thought and action would have been welcome.

Arp’s concentration on selection and integration as the basis of creative thought is puzzling for a couple of reasons. For one, it doesn’t do the explanatory work that he seems to think it does regarding the evolution of creativity from biological processes that also select and integrate. But more importantly, it leads him to neglect what is genuinely challenging about creative cognition, namely its *creative* aspect, and the generation of novelty. Although he mentions this, he says hardly anything about it, and fails to mention the extensive literature in Artificial Intelligence, for example, that is focused on just this issue (e.g., Boden, 1994). On his view, in thinking creatively we are selecting from among visual images that appear to be relevant and integrating them into imagined scenarios. Even if this is so, we still don’t know how we come up with possible images from which we may select. We don’t know how we decide which is relevant, and perhaps more consequentially, we still don’t know how we generate an image of something we have never seen. Arp might possibly have something of an explanation of visual memory. But how do we generate novel images of objects, such as occurs in his example of inventing the javelin? Moreover, it is not clear how it is we come up with the imagined scenarios into which we integrate these images. An explanation of creativity needs to account for how we imagine that which we have never seen.

It is good that Arp gives a fairly detailed explanation of *why* creativity might have been helpful in the changing environments of our progenitors, and so why it might have been selected. Other than that, though, he does not accomplish what he sets out to do. He does not offer a tolerable explanation of *what* creative thought is, and neither does he offer a plausible explanation of how it evolved. The reader isn’t left with a clearer understanding of how we generate novel images and use such images to solve problems, much less with any new insight into the mind-body problem. Much of the book is irrelevant to his main points, and Arp doesn’t adequately establish those points.

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