

## COGNITIVE SCIENCE

## Arguing for Embodied Consciousness

Harold Fromm

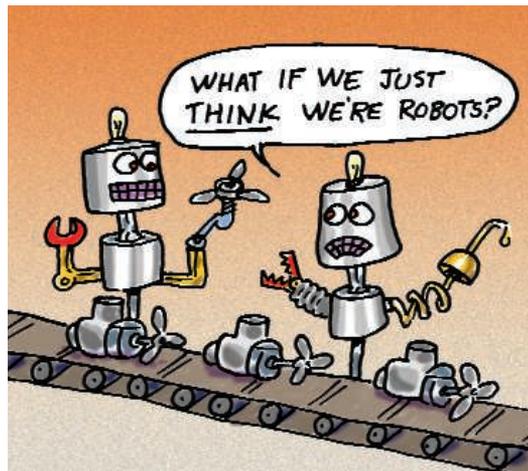
To describe his project, Edward Slingerland could hardly have chosen a more direct title than *What Science Offers the Humanities: Integrating Body and Culture*. Coming from an academic career in Asian studies and theology (as a nonbeliever), Slingerland (a co-founder of the Centre for the Study of Human Evolution, Cognition, and Culture at the University of British Columbia) prepared by spending the past five years reading widely and deeply in cognitive neurosciences and the philosophy of science. Although he mainly focuses on consciousness, his overall task is to address the befuddled dualism that still dominates most of our intellectual disciplines.

Slingerland's central theme is that everything human has evolved in the interests of the materiality of the body. He identifies objectivist realism and postmodern relativity, both insufficiently attentive to the body, as the major epistemologies to be swept away, followed by the dualism of body and soul. For Slingerland, the presiding geni behind such a cleansing are George Lakoff and Mark Johnson, with heavier debts to Johnson [whose terse summary of embodiment in (*I*) appeared too late for Slingerland to reference]. They view all thought and human behavior as generated by the body and expressed as conceptual metaphors that translate physical categories (such as forward, backward, up, and down) into abstract categories (such as progress, benightedness, divinity, immortality). These body-driven metaphors, Slingerland writes, are a "set of limitations on human cognition, constraining human conceptions of entities, categories, causation, physics, psychology, biology, and other humanly relevant domains."

The supposedly objective world is not "some preexisting object out there in the world, with a set of invariant and observer-independent properties, simply waiting to be found the way one finds a lost sock under the bed." All we can ever see or understand is what our own bodily faculties permit via the current structure of the brain.

In opposition to objective realism, postmodern relativity regards language and culture as constituting the only "real" world possible for us. It posits an endless hall of mirrors with no access to outside—epitomized by Derrida's notorious remark that there is nothing (at least for humans) outside of texts (i.e., culture). This view, which dominated the humanities for several decades, is mercifully beginning to fade as the cognitive sciences have matured and are increasingly promulgated.

Even though the knowing human subject is itself just a thing and not an immaterial locus of reason, the universe it experiences is as real



and functional for us as any "thing" could possibly be. We do get some things "right," even if we can never know the noumenal genesis behind our knowledge. And the very concept of noumena (things in themselves independent of any observer) now seems somewhat obsolete, given that the intuition of discrete, self-bounded "things" is as built-in to the human psyche as the Kantian intuitions of space and time, grounding all experience.

Our million billion synapses produce a "person" with the illusion of a self. Slingerland holds that "we are robots designed to be constitutionally incapable of experiencing ourselves and other conspecifics as robots." Our innate and overactive theory of mind (that other people, like ourselves, have

"intentions") projects agency onto everything—in the past, even onto stones and trees. The "hard problem" for philosophy of consciousness (to use David Chalmers's phrase) remains: what are thoughts, cogitations, thinkers, qualia? Chalmers's solution, alas, swept away Cartesian dualism only to sneak his own magic spook, conscious experience (for him, on par with mass, charge, and space-time), in through the back door (2, 3).

Slingerland starts with Darwin and eventually follows Daniel Dennett so far as to agree that consciousness can be done full justice through third-person descriptions that require no mysterious, unaccounted-for, non-material, first-person entity as substrate. Thus the famous "Mary," who intellectually knows everything there is to know about color despite having been sequestered for life in a color-free lab, will recognize red the first time she steps outside (4). And Thomas Nagel's famous bats don't know anything about bathood that we can't figure out for ourselves from observation (5). No first-person construct, no locus of consciousness, need be invoked.

The next step, if you want to go so far (the jury is out), is to eliminate consciousness altogether, because there's nothing for it to do that can't be done without it. And with it, you need a spook to keep the show on the road. Choose your insoluble problem: eliminate consciousness altogether as superfluous or explain it (if there's really a you who makes such choices). Slingerland prefers the first option.

His conclusion, which I can hardly do justice to here, is relatively satisfying. He notes that although we don't have great difficulty knowing that Earth revolves around the Sun while feeling that the Sun is rising and setting (Dennett's favorite example of folk psychology), "no cognitively undamaged human being can help *acting* like and at some level really *feeling* that he or she is free"—however nonsensical the notion of agencyless free will (i.e., "choices" without a self to make them). Still, once the corrosive acid of Darwinism [to use Dennett's figure from (6)] has resolved the body-mind dualism into body alone, some but not most of us are able "to view human beings simultaneously under two descriptions: as physical systems and as persons."

What does Slingerland's intellectually acute, wide-ranging, well-written, and deeply knowledgeable survey of the hard and soft disciplines behind consciousness achieve? For some from the humanities, this book will be a

**What Science Offers the Humanities**  
Integrating Body and Culture

by Edward Slingerland

Cambridge University Press, New York, 2008.

388 pp. \$85, £45.

ISBN 9780521877701.

Paper, \$24.99, £18.99.

ISBN 9780521701518.

revelation. But for those clinging to cultural construction or belief in an immaterial self, still needed is a scaled-down version of *What Science Offers the Humanities* that reduces its length by half and removes the various byways and densities that might dim the epiphanal light bulbs needed to initiate conversion experiences. And the book (in whichever form) wouldn't do the hard sciences any harm either.

#### References

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5. T. Nagel, *Philos. Rev.* **83**, 435 (1974).
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## SCIENCE AND ART

# Subject Matter Matters

Mary Parrish

Having received a bachelor of fine arts degree at a time when artists were trained to look beyond realism for inspiration, that subject matter was not a criterion on which art should be judged, and that illustration is not art (and then later becoming a scientific illustrator), I read with interest Darryl Wheye and Donald Kennedy's *Humans, Nature, and Birds* and Jane Davidson's *A History of Paleontology Illustration*. The books offer interesting and well-constructed overviews of the natural history and imagery of birds and fossils. At the same time, the authors use their material to support the shared thesis, outlined in their introductions, that the science found in the images unites the material into a unique genre of art.

*Humans, Nature, and Birds* is an outgrowth of Stanford University's online Ornithological Artist Registry of bird art (1). Selections from the book, including sample images, have been posted online for public access (2). Wheye (an artist and writer) and Kennedy (a former editor-in-chief of *Science*) present birds as a case study to describe what they call "Science Art," assigning the term to a

genre of art that contains scientific content. In their view, Science Art needs to say "something about the natural world and how it works" and should always be "accompanied by an explanatory caption that helps the viewer decode the underlying science."

Their text highlights the science they find in (and behind) the images they selected, and I found their explanations enriched my understanding of the material. Further, I appreciated Wheye and Kennedy's awareness that there is often more to the creation of the images than what immediately meets the eye. Commonly, at least 85% of the effort in preparing a scientific illustration is spent on (often collaborative) research, and only some 15% on visual rendering of the findings from that research. A seemingly simple line drawing such as the Cretaceous landscape (Davidson's figure 6.7) that Edward Vulliamy prepared for Albert

**Humans, Nature, and Birds**  
Science Art from Cave Walls to Computer Screens

by Darryl Wheye and Donald Kennedy

Yale University Press,  
New Haven, CT, 2008.  
229 pp. \$37.50, £25.  
ISBN 9780300123883.

**A History of Paleontology Illustration**

by Jane P. Davidson

Indiana University Press,  
Bloomington, 2008. 235 pp.  
\$39.95. ISBN 9780253351753.

Brueghel the Elder's *The Peasant and the Nest Robber* (1568), with its "explicit conservation message"; Paul Klee's expressionist painting *Twittering Machine* (1922), which some have interpreted as a satire of laboratory science; and *KEO the Winged Satellite*, the passive satellite time capsule envisioned by Jean-Marc Philippe (1998).

*Humans, Nature, and Birds* resembles a catalog for an art exhibition. It is divided into three major sections: a Lower Gallery ("Bird Art over the Millennia"), a Mezzanine, and an Upper Gallery ("How Science and Art Overlap"). The two galleries each contain five thematic rooms filled with images. The art appears on the left pages, opposite explanatory text that features scientific interpretations.

The Mezzanine contains no images but offers a very interesting essay on aesthetics as it relates to science and art along with discussions about the interplay of the cultures of science and art and the work processes of scientists and artists. The authors suggest (à la Denis Diderot) that an aesthetically profound image records an emotional response to a rational idea. Text illuminates art; art illuminates text (4).

*A History of Paleontology Illustration* stems from a course of the same name that Davidson, a professor of art history, teaches at the University of Nevada, Reno. She is a specialist in 17th-century Dutch and Flemish painting who also teaches courses in the history of science and has a passion for paleontology, and these themes meld well in the book.

The 82 black-and-white figures and 8 color plates (the majority of which depict vertebrate material) representing 500 years of fossil imagery emerge from the matrix of paleontology itself. Davidson structures the book around a chronological history of paleontology, starting in the 15th century and continuing to the present decade.

Davidson's material ranges from the beautiful, such as J. C. McConnell's detailed drawings of crinoid specimens (1883), to the



**Minimal realism.** Charley Harper reduced his subjects, such as *Eskimo Curlew* (serigraph, 1957), and their ecological context to elementary visual terms.

Charles Seward (3) may have required reconstructing each species from fragmentary material and descriptions (possibly contradictory) by several paleobotanists. I also enjoyed gaining a glimpse into what some scientists see when they look at art.

Even when the focus is restricted to avian examples, Science Art covers a wide spectrum. The book features some 60 beautifully reproduced color images that collectively span 30,000 years of birds in art. These include an owl from Chauvet Cave in France (the oldest known cave painting that depicts a bird); Pieter

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