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Darwin's empirical evidence

Commentary on [Reber](#) on *Origins of Mind*

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Abstract: Darwin's extensive writings may seem antiquated to current thinkers with their predilections for cognitive science, neuroscience, and analytic branches of philosophy. He showed that morphologies are not simply taxonomic distinctions that allow classification into species. They describe living animals, hence morphologies-in-motion: animate forms of life engaged in synergies of meaningful movement, all of which are testimony to animal sentience.

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Kudos to Arthur Reber (2016) for centering attention on the evolutionary origins of mind, consciousness, subjectivity, and other specifying labels for “mental” phenomena. Several additional points can be made on behalf of the basic evolutionary perspective that Reber sets forth (see also Sheets-Johnstone 1998, 1999/2011, 2009). The points are critical in the sense of acknowledging and carrying forward earlier empirical research. The points are thus not critical in a counter-Reber sense, but in the sense of elaborating Reber's thesis. Science, after all, unlike the arts, including literature, builds on past empirical evidence. Darwin's extensive writings may seem relics to many modern 20th-21st century thinkers whose predilections for today's cognitive science, neuroscience, and analytic branches of philosophy steer them clear of such seemingly antiquated studies. There is an apparent ignorance of Darwin's field studies, which ranged worldwide as well as species-wide. Field studies of animals are essential to knowing animals as they are in their real-life, real-time, everyday lives.

1. Writing about the mental capacities of nonhuman animals without reference to Darwin's writings — or anything beyond *The Origin of Species* — puts one at a disadvantage. One bypasses empirical evidence that documents the thesis one is putting forth. Reber's first section, “The Origins of the CBC Model,” is an example. His 21st century engagement with a small green caterpillar is a microscopic portrait of Darwin's 19th century engagement with worms. The last book that Darwin (2010 [1897]) wrote — *The Formation of Vegetable Mould through the Action of Worms with Observations on Their Habits* — provides straightforward evidence of the intelligence of worms. It should be required reading for anyone concerned with animal sentience. In addition to writing in fine detail about geological effects of the action of worms,

Darwin (2010 [1897]) describes the actions themselves, including a sizable section on the intelligence of worms, concluding with the following observations:

If worms are able to judge, either before drawing or after having drawn an object close to the mouths of their burrows, how best to drag it in, they must acquire some notion of its general shape. This they probably acquire by touching it in many places with the anterior extremity of their bodies, which serves as a tactile organ. It may be well to remember how perfect the sense of touch becomes in a man when born blind and deaf, as are worms. If worms have the power of acquiring some notion, however rude, of the shape of an object and of their burrows, as seems to be the case, they deserve to be called intelligent; for they then act in nearly the same manner as would a man under similar circumstances. (p. 99)

A page later, in relation to the idea that “worms, although standing low in the scale of organization, possess some degree of intelligence,” he states: “This will strike every one as very improbable; but it may be doubted whether we know enough about the nervous system of the lower animals to justify our natural distrust of such a conclusion. With respect to the small size of the cerebral ganglia, we should remember what a mass of inherited knowledge, with some power of adapting means to an end, is crowded into the minute brain of a worker-ant” (ibid., p. 100). Darwin 1981 [1871] actually called attention to the brain of ants many years earlier (p. 145).

2. The error Reber identifies as a category error is from an evolutionary perspective an empirical error. No appeal need be made to the propriety of “anthropomorphism” in seeing dogs at play as being “happy” (Reber, p. 3). Here again one can reference Darwin (1965 [1872]), specifically what he terms “high spirits” and “cheerfulness” in *The Expression of Emotions in Man and Animals* (pp. 210-212). What Darwin describes and in some instances shows graphically in his pan-animate study of emotions is noteworthy, all the more so with respect to humans’ common judgment of emotion as simply a facial phenomenon. As Darwin shows, the whole body is involved in emotion. It is thus not surprising that emotions move through animate bodies and move them to move (Sheets-Johnstone 1999/2009, 2006). There is a dynamic congruity between emotions and movement. Not only would humans be otherwise incapable of feigning or restraining an emotion, but also nonhuman primates would be incapable of “tactical deception” (Whiten and Byrne, 1988; see also Altmann, 1967, on “comsigns” and Sheets-Johnstone, 2008, pp. 295-299 on the intercorporeal relevance of Altmann’s concept).

3. Darwin’s extensive studies of the mental powers and moral sense of animals should also be required reading. One might ask whether 20th and 21st century scientists can claim to have a more sophisticated empirical knowledge of the mental powers and moral sense of nonhuman and human animals on the basis of brain studies. In *The Descent of Man and Selection in Relation to Sex*, Darwin (1981 [1871]) devotes two whole chapters to the mental powers of “Man and the Lower Animals” and further chapters to development, i.e., the phylogenetic heritage of Man, and to intellectual and moral faculties. Perhaps particularly relevant to Reber’s target article are Darwin’s (1981 [1871]) observations concerning the reasoning faculties of animals, observations that obviously complement his later observations of worms:

Of all the faculties of the human mind, it will, I presume, be admitted that *Reason* stands at the summit. Few persons any longer dispute that animals possess some power of reasoning. Animals may constantly be seen to pause, deliberate, and resolve. It is a significant fact, that the more the habits of any particular animal are studied by a naturalist, the more he attributes to reason and the less to unlearned instincts. In future chapters we shall see that some animals extremely low in the scale apparently display a certain amount of reason. (p. 46)

Darwin later quotes a South American muleteer, “I will not give you the mule whose step is easiest, but *la mas racional*--the one that reasons best,” and adds the following comment from Humboldt with respect to “*la mas racional*”: “[T]his popular expression, dictated by long experience, combats the system of animated machines, better perhaps than all the arguments of speculative philosophy” (ibid. p. 48).

In sum, Darwin’s worldwide studies show that morphologies are not simply taxonomic distinctions that allow classification into species. Morphologies describe living animals, hence morphologies-in-motion: animate forms of life engaged in synergies of meaningful movement, all of which are testimony to animal sentience.

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