

# Review of: "Femmes finales: natural selection, physiology, and the return of the repressed"

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Haig's historical discussion is an interesting and important contribution to our understanding of the role of teleology in life science. There is much to enjoy and to learn from his detailed analysis. Moreover, by linking the discussion to current ideas of (evolutionary) biologists and philosophers, his contribution is thought-provoking. I will mention some issues (discussed by Kenny, 1998, and Hacker, 2003, chapter 6) that may help the author to clarify his thoughts about this difficult topic. These concern the question why it was and is for many so difficult to understand that teleological explanations are a distinctive form of explanation.

Discussions of teleology are an Aristotelian legacy. Aristotle distinguished four kinds of explanations telling us why things are as they are or why events occur as they occur. These explanations are complementary. What are nowadays called teleological explanations are one of them; efficient causal explanations, that later became the core of scientific explanations in modern physics and life science, another. The trivial but important point to notice that Aristotle lived BC. Hence, in his discussion there is no link between teleology and the Christian argument from design. That association became essential after Aquinas synthesized the Aristotelian world view with the Judaeo-Christian one (natural phenomena as described in the book of Job), resulting in teleonomic physics of medieval science. While Aristotle discussed the teleonomy of inanimate nature by invoking his conception of naked purpose (inanimate objects have a natural tendency to move towards their 'natural place'), Aquinas associated purpose with design. If things have a natural purpose or *telos*, according to Aquinas that was because their Maker had designed them.

The scientific revolution, resulting in the new physics, broke with the medieval conception of teleonomic physics: it was shown that efficient causal explanations, not teleonomic ones, were explanatory adequate for cosmology (and for physics in general). Descartes later added the dubious claim that these explanations should be adequate for life science as well, excluding teleology from natural science. However, though modern physics broke with medieval teleonomic physics, it did not brake with design. Yet design was in their picture no longer linked to teleology, but to efficient causal explanations. The best evidence for a Designer, it was now argued, is offered by investigating efficient causation. By examining his works, God should be admired as their efficient cause. The cosmos was seen by scientists as the clockwork of God; their discoveries as confirmation of design. What physicists discovered was thought to be the rational order and harmony of the external world which God had imposed upon it and which he revealed to us in the language of mathematics. Thus, the cosmos was seen as the handiwork of God created according to mathematical design. This conception of design turned out to have a powerful influence on later western thought.

Teleology was excluded from physics for good reasons, but it was and is less obvious why it should be excluded from life science as well. After all, Harvey discovered the function of the heart in the circulatory system. And can we not know, for example, the purpose of the wings of a crow or discover the function of the trunk of an elephant? And had Aristotle not argued that teleological explanations are a distinctive kind of explanation? However, given the association of teleology with design, it was and still is (as Haig also shows) difficult to dissociate purpose from design. For example Kant, in his *Critique of the Power of Judgment* did not see that teleology is a special kind of explanation (as Aristotle had argued): purpose in nature was according to him restricted to design. And because he conceived of teleology in terms of design, he argued that an explanation of *what something is for* must be a kind of causal explanation of why it exists (resulting in Kant's confused thought that purposiveness of nature amounts to a regulative principle). A similar form of reasoning was and still is popular among some evolutionary biologists and philosophers of biology, showing how difficult it is for scientists and philosophers, living in the shadow of Descartes, to conceive of purpose without design.

It was Darwin who showed how purpose can evolve in life forms without design. The point to notice is that Darwin did not replace the argument from design by natural selection, as many have mistakenly believed (notice why the association made by Descartes and others between design and efficient causal explanations mentioned above is here misleading). Darwin rehabilitated Aristotelian teleological explanations in life science and extended them with evolutionary ones. So how are teleological explanations related to causal explanations in life science?

Teleological explanations are not causal explanations. When we, for example, explain what an organ is for, we do not answer the question how it came about. We also do not answer the question by what causal processes it fulfills its function. To repeat: teleological explanations are not evolutionary explanations of how the organ evolved or of how the organ evolves during individual development. Teleological explanations explain what end (*telos*) is served by an organ. Thus, that eyes are for seeing or legs for walking are not aetiological explanations. This observation entails that evolutionary, ontogenetic and teleological explanations are three different kinds of explanations. After Darwin we can do something that Aristotle could not do, namely to extend the Aristotelian conception of teleology with evolutionary explanations.

The association of teleology with design and the repudiation of teleology in physics clarifies why it was so difficult to see that we can discuss teleological explanations as a distinctive kind of explanation. It also clarifies why there are still scientists and philosophers who argue that there can be no coherent attribution of function to an organ that does not allude either to design or natural selection. But when we say that eyes are for seeing or that the heart has a function in the circulatory system, we are not committed to either natural theology or the theory of evolution. As Aristotle has taught us, purpose is linked to life for living beings have a good. The notion of a good is linked to health and welfare, to thriving, and so on. Some things are detrimental to the health of an organism (malfunctioning organs), to satisfying its needs, and to its capacities to exercise its abilities optimally. Hence teleology is linked to axiology (the good of man is rooted in our biology) and has therefore an essential role in medicine.

If we take Darwin's rehabilitation of Aristotelian teleology in life science seriously, we can discern three things that have a purpose. First organs have a purpose (their function). They *exist for a purpose*, as Kenny put it. Second, goal-directed

activities of animals have a purpose (they *act for a purpose*, including unconscious responses). That purpose is the end for the sake of which they are done. Reflexes are examples (they are related to good of the animal, like coughing and sneezing), but also instinctual (unconscious) activities (responses to threats or predators). Cognitive (or conscious) purposive behaviours are other examples. It is an interesting question how, as the result of language evolution, human intentional behaviour evolved as an extension of the (conscious) goal-directed behaviours of our predecessors. Third, morphogenesis of an organism and its parts is teleonomic (deviations lead, as Aristotle remarked, to monstrosities). And, as Hacker remarks, by teleonomic we mean here no more than that regularities are explicable in terms of purpose.

#### References:

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