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

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Potential competing interests: No potential competing interests to declare.

David Haig's article, which follows in the vein of his 2020 volume*From Darwin to Derrida: Selfish Genes, Social Selves, and the Meanings of Life*, involves an in-depth analysis of certain analogies asserted by historical figures that relate to ongoing and contemporary debates in the life sciences surrounding mechanistic and teleological explanation. While Haig's discourse here is highly illuminating in relation to understanding the contours of the contemporary discordance between mechanistic and teleological metaphysical lenses in the study of life, it is not entirely clear from the paper's introduction and conclusion what specific claim he ultimately intends to argue for in this work. He seems to want to do justice to teleology in the life sciences going forward, but the degree of emphasis in relation to it vis-à-vis the mechanistic picture is unclear. Also, answers to the questions of how teleology and mechanism are to fit together and to what degree one should be tolerant of either of them in the study of life remain murky. After all, the cybernetical theory of the twentieth century[1] aimed to resurrect teleological concepts but to incorporate them into a singular mechanistic framework with which to study machines and living organisms alike. And, as Haig points out, some neo-Darwinian thinking stemming from the Modern Synthesis largely suppressed teleological considerations in the study of life, taking phenomena appearing to be purposive to be teleonomic in character and reducible to mechanistic explanation, save, for example, those allegedly belonging to selfish genes.[2] In this vein, Richard Dawkins expressed that human beings have "purpose" on the brain but that this is illusory when it comes to explaining occurrences in the natural world.[3] As such, it is helpful to revisit Haig's previous volume where he suggests that naturalized final and formal causes are objectively real but they emerged out from efficient and material causes, yet that "the dogmatic exclusion of teleology from the working philosophy of most biologists has become an impediment to scientific progress."[4] Then again, in Derridean fashion, interpreters are playfully free to make meaning of the text in front of them if they choose to, to corral and to canalize its semiotic drift, beyond any supposed intention of the author who generated and then abandoned it. Of course, invoking Derridean deconstruction and *différance* in the context of evolutionary theory can be viewed as consistent with Dennett's program of submitting of our most cherished concepts (in this case, e.g., language, logic, metaphysics, values, morality, meaning) to the metaphorical "universal acid" that is natural selection in ongoing fashion and discovering what remains following the corrosion.[5]

A great deal of Haig's analysis here is on the analogies, asserted by historical figures such as Francis Bacon, which, in "bully-pulpit" fashion, prioritized mechanistic explanation over teleological explanation so as to keep teleological thinking in the study of life "in its (proper) place,"[6] as well as counter-analogies propounded by the more teleologically-minded. For Bacon and others, the pursuit of final causes was a dead end in relation to the advancement of knowledge, especially in the physical sciences. For them, so one analogy goes, the pursuit of final causes is like the vestal virgins who are

"devoted to the service of the Divinity"[7] and who do not bring about fruitful results (i.e., offspring), namely, the consideration of them is believed not to lead to any novel scientific discoveries. In other words, for them, "the investigation of final causes is sterile; like a virgin consecrated to God, it gives birth to nothing."[8] Or the investigation of final causes is like a man going to a prostitute for momentary fulfillment but not for successful reproduction as if to suggest that life is meaningless, fruitless, sterile, barren, useless, unproductive, and/or not fulfilling its true purpose unless one chooses to reproduce oneself, and/or at least makes efforts toward this goal. This perspective can be seen echoed later in Auguste Comte's Positivism, which eschews theological and philosophical explanation, which are deemed not to provide practical and productive resolutions to human problems, and instead favours (mechanistic) science in the form of social physics.[9] From a more contemporary perspective, the reproduction-oriented analogies of figures like Bacon are not only chauvinistic but are blind to what is needed for humanity to survive given the present realities of global ecological problems like overpopulation and climate change. Here, one might raise the Nietzschean point that ethical orientations that are based in doing what promotes survival and reproductive success are not representative of authentic morality, as they are ultimately based on egoistic motives.[10] To further a Dawkinsian metaphor, we as phenotypes must not only rebel against our selfish genes, but must rebel against the motives of our selfish genes to have us rebel (e.g., only reducing our personal carbon footprint in the light of the onset of anthropogenic global climate change and/or of the problem of overpopulation for the sake of preserving the environmental conditions that would permit our genes to replicate themselves long into the future). Furthermore, it might be pointed out that such reproduction-oriented analogies correspond to the political and social shifts occurring during the Enlightenment. According to Foucault, European societies during the seventeenth and eighteenth centuries moved from modes of power involving the blood-rights of kings to punish criminals to rulers aiming to harness the power of the lives of their subjects (as in biopower) rather than merely putting them to death. Rulers of populations would be better off and rendered more powerful with greater numbers of subjects than with less. As such, as Foucault tells us, the vital functions (e.g., sex; reproduction) of populations took place and were promoted, as long as they were surveilled, objectified, and controlled by discourse.[11] To be sure, one might point to some of the scientifically-authorized discourses surrounding onanism that surfaced in the eighteenth and nineteenth century, which enforced the notion that masturbation was a crime that would lead to physiological and mental sickness, insanity, anxiety, syphilis, digestive upset, blindness, and death.[12]

In the twentieth century, prior to the onset of the Modern Synthesis, some critics of Darwinian selectionist theory (like D'Arcy Thompson) held that the Darwinian emphases on adaptation, survival, and reproduction were implicitly teleological in nature as they implied conclusions about the functions and the ultimate goals of living creatures.[13] Furthermore, in many of the historical analogies that Haig takes up, there is little recognition of the differences between the metaphysical lenses through which we view living organisms so as to explain them (i.e., mechanism and teleology), on the one hand, and the reproductive goals of living organisms, on the other. As such, not only do the chauvinistic analogies that Haig focuses on constitute *ad hominem* attacks against those who would prioritize teleological explanation over mechanistic explanation, but they are weak analogies. Furthermore, they may be deemed internally self-contradictory, as implicit in many of the historical analogies that Haig analyzes is an emphasis on the *telos* of reproduction and the purposive advancement of knowledge.

But, delving further into the analogies that Haig takes up in the article, they can be said, generally, to revolve around an enforcement of Kant's supposed "final stance" in relation to mechanistic and teleological explanation in the emerging inquiries into the nature of life of his day. While Kant (in the Third Critique) can be seen veritably as a Father of the *autopoietic* (Gr. self-producing, self-maintaining) definition of life, which may be seen to characterize it as involving intrinsically purposive processes of self-organization,[14] Kant maintained that it was "the meritorious duty" of natural scientists "to pursue the mechanism of nature, for the sake of an explanation of the products of nature, as far as can plausibly be done, and indeed not to give up this effort."[15] For him, any narrow quest to point to final causes (e.g., as in the vitalism of his day) came too close to the attempt to arrive at the thing-in-itself, which was something he deemed to be beyond the capacities of reason. Ultimately, for Kant, in the study of life, teleology was to be taken as regulative, and mechanism was to be considered constitutive. In this way, Kant endeavoured to give both sides their due, but he warned against jumbling them together haphazardly in inquiry[16] and enforced the notion that rigorous scientific explanation chiefly involved the search for mechanisms. However, Kant's analogies in the First Critique, between the various epistemological stances of philosophers like Descartes and Hume and the theories of embryonic development of his day (i.e., Preformationism, Epigenesis, and Spontaneous Generation), hint at the notion that these standpoints can be brought together coherently.[17] As we know today, although embryonic development centrally involves processes of differentiation which alter the original form of the embryo at conception (as in Epigenesis), such processes are largely, but not exclusively, guided by the "programming" that is set by genetic information (as in Preformationism). There are also epigenetic and environmental influences in development (as in Spontaneous Generation).

Pointing to the difficulties in "purifying biology" such that it is focused on mechanistic considerations in relation to the living to the exclusion of teleological ones, Dawkins in "The Selfish Gene" (1976), "God's Utility Function" (1995), and elsewhere, maintains that when it comes to the living, there is a *telos* to be found in the natural world, although it is only a singular goal. For him, the purpose of living creatures *qua* phenotypes is to replicate their selfish genes, which are, in his own characterization, are the "Prime Mover[s]"[18] of all of life. Phenotypes are, for Dawkins, mere replication vehicles or machines for their selfish genes. However, beyond the answers that Dawkins provides, in relation to the purposes of life, we might engage in a second round of questioning having to do with final causes, by asking e.g., what is the purpose of replicating one's selfish genes? The answer is: to persist in the face of the forces of entropy, the Second Law of Thermodynamics.[19] However, it should be noted that selfish gene replication is not the only way in which living organisms preserve themselves against the forces of entropy for a time. Organisms are subject to the same laws as "inanimate" chemical matter, a difference being that they autocatalyze the oscillating reactions that keep them afloat for a time. Autopoietic, homeostatic, and chronobiological processes are other ways by which living organisms persist. As Evan Thompson points out, some of these ways may even be more originary than the replication of genes, especially given that organisms generally must exist for a time before they are able to replicate their genes.[20] But in a third round of questioning concerning final causes, one might ask: why exactly do organisms need to persist in the face of entropy? Why do cells even bother to maintain themselves for a time in the face of inevitable decay and disintegration? Why do cells, organelles, organs, and tissues work together in order to maintain the whole that is the living creature, as in autopoiesis, when entropic demise will necessarily claim them? What is organismic self-organization for exactly? What

exactly are organisms and their physiological components trying to accomplish by living, growing, bonding together, differentiating, perpetuating themselves, and evolving, as though they were driven by an élan vital? Why do genes have to (selfishly) replicate themselves?

In attempting to answer questions like these, which imply final causality, it is to be admitted at least initially, that one draws a blank. No immediate answers to these questions are forthcoming without further inquiry. But these questions certainly promote further inquiry, which will undoubtedly involve both teleological and mechanistic considerations. Some of the more mechanistic reduction-oriented inquirers will proceed by trying to answer the hows / the efficient causes that underpin the whys rather than to focus directly on the whys / the final causes (as perhaps the more holistic, organicist, or teleologically-oriented inquirers will do). But the diverse camps will all admit to the legitimacy of at least some of these questions. So, just because we initially draw a blank when trying to answer these questions does not mean that these questions concerning final causes are useless (which is the concern of the Utilitarian), barren, sterile, or impractical, etc…. Rather, they inspire and guide future scientific and natural-philosophical inquiry.

As to the assumption made on the parts of some of the historical figures that Haig cites that rendering the teleological idea acceptable in the life sciences surreptitiously threatens an undue intrusion of theology and religion into science, one might question the notion that a teleological orientation is necessarily supportive of the hypothesis of the existence of a Divine Creator or Supernatural Agent but that a mechanistic worldview is antithetical to this. As Dennett writes in the Foreword to Haig's prior volume, "Aristotle's *telos* is a seductive idea but it smells . . .*divine* and hence *anathema.* Should we puritanically abstain from teleology when doing science (but not when doing literature, history, philosophy, psychology), or has Darwin shown us how we can tame Aristotle's shrew, and make an honest woman of her?"[21] But Paley's Teleological Argument for the Existence of God posits a thoroughly mechanistic worldview. It holds the universe to be akin to a pocket-watch, a machine that has a function to tell time, undoubtedly has a purposive, intelligent maker or designer behind it. In this way, Paley's argument by analogy aims to be demonstrative of the existence of a capital 'I' and capital 'D' Intelligent Designer. Taking the distinction between machines and organisms that has been made by Hans Jonas (1953) and more recently by Daniel Nicholson (2013) seriously, an unstated claim which may be said to accompany Paley's Teleological Argument here is basically that machines are extrinsically purposive only. They require an external purposive designer, whereas living organisms are intrinsically purposive, autopoietic, and/or self-organizing and do not require external purposive agents acting on them for their existence and for the maintenance of that existence. Atheist, Dawkins, in *The Blind Watchmaker*, espouses nearly the exact same mechanistic worldview as Paley does, one of the only differences being that he disputes the conclusion that it must be created by God. When it comes to genes and their phenotypes, in advancing his selfish gene / extended phenotype conception of the organism, Dawkins suggests, without considering epigenetic factors, that genes are externally-related only to their phenotypes, acting on them without any reciprocal response, even though he admits that DNA is "cocooned in protein" and "swaddled in membranes,"[22] namely, that genes and phenotypes are also internally related. Instead, as highlighted by Dawkins' afterword in Krauss' *A Universe From Nothing*, "nothing" in the form of dark matter or dark energy is held to be the cause of the universe. Here, we may question whether dark matter or energy is a "something" that also requires a reference to something else for its explanation. But one might further ask: why should we rest content with the notion that "nothing" in the form of dark

energy or matter is the source of the universe? As for organismic universes, such as that postulated by David Hume's interlocutor, Philo, in *Dialogues Concerning Natural Religion*, who suggests that the universe is "more like [an organism] than a knitting loom,"[23] and by Alfred North Whitehead in *Process and Reality*, these may not require an external Creator. This is because, as Jonas and Nicholson tell us, living organisms are self-organizing, intrinsically purposive totalities, and do not require an intelligent being programming them from outside. While Hume argues that the universe could be considered a self-organizing totality without a need to postulate anything outside of it (as in external relations) that is responsible for its existence, Whitehead posits the existence of a process-relational God who is not only externally-related to the world but also internally related with it. At any rate, the main point here is that, with reference to Jonas' and Nicholson's distinction between living organisms and machines,[24] there are good reasons for why an organismic universe may not require an external Creator and there are good reasons for why a mechanistic universe can be associated with the notion that an external Creator exists. It is a potentially flawed assumption to believe that a teleological universe necessarily goes hand-in-hand with the existence of a purposive Divine Creator and that a mechanistic universe is necessarily a universe without a God.

On the whole, Haig's "Femme Fatales" article, which focuses on such issues such as the fruitfulness of the teleological idea in biology is itself a testament to the constructive and edifying nature of debates concerning life, teleology, and mechanism. In short, it shows that teleology is not merely to be viewed as "a nuisance … in the scientific laboratory,"[25] but a focus on it can help to generate novel questions and important insights as to the nature and character of life. Taken alone, the mechanistic idea is limited because if every individual thing in existence necessarily is the byproduct of efficient causes that are external to it, as in the Principle of Sufficient Reason, then ultimate explanation by way of scientific inquiry (e.g., in physics, chemistry, and biology) is impossible, and scientific knowledge will necessarily be incomplete and/or beset by "blind spots." At the same time, considered alone, the teleological orientation is limited because it engages in a narrow quest for ultimate explanation without attending to the external causal relations among finite particulars. In the study of life, why exactly should we have to prioritize and select one of these metaphysical lenses (mechanism or teleology) over the other, as in an exclusive either / or proposition in which one must be eliminated? Why exactly should biologists have to continue to keep their "mistress" that is the teleological idea a secret in favour of their more socially acceptable or legally "above board" relationship with the mechanistic idea, especially if the notion of an efficient cause requires some appeal to the notion of a final cause in order to make sense? Returning to Haig's invocation of Derrida, an overcoming of logocentrism pertaining to causal explanation in the life sciences, as part of an "Extended Evolutionary Synthesis,"[26] would seem to depend upon challenging the assumption that we have to prioritize and select one over the other. Last, one might point out that in the ongoing debates between mechanism and teleology in the life sciences, the competing perspectives seem to entail a common assumption of the general framework of Aristotelian fourfold causality, which is a philosophical rubric concerning interrelated modes of explanation that has largely been considered absolute since antiquity.

Notes:

1. See Wiener, Rosenblueth, and Bigelow 1943, as well as Deutsche 1951.

2. As an aside, for Dawkins (2006a), the existence of phenomena such as “segregation distorters” (see pp. 236-237) pointing to genes that attempt to bias the “rules” of genetic shuffling so as to maximize the probability of their replication, help to prove the reductionist notion that the individual gene is to be viewed as the fundamental unit of selection. On this note, Haig, in his volume, recognizes that genes may work cooperatively together and/or strategically alone, and aims to apply the concepts of group / community / social / kin selection in the study of the workings of genes / genomes. In this vein, here, Haig may be seen to assume a fairly Dennettian synthetic position reductionism and emergentism that avoids the fallacies of “greedy reductionism” and “skyhookery” (see Dennett 1995, especially pp. 73-80).

3. See Dawkins 1995. Dawkins does not bother to inquiry into why, from an evolutionary perspective, human beings have “purpose” on the brain (as he says). From an Evolutionary Neo-Kantian (e.g., Lorenzian) perspective, teleology would not only seem to be an *a priori* concept belonging to the constitutions of rational (and other) living beings that has been selected for over eons of evolutionary time, but it also has objective correlates in the natural world.

4. Haig 2020, p. 158 (electronic version).

5. For example, see Dennett 1995, pp. 61-84. Dennett wrote the Foreword to Haig’s volume, *From Darwin to Derrida* (2020).

6. Haig 2020, p. 17 (electronic version).

7. Haig, “Femme Fatales” (the work being reviewed here), p. 4.

8. Haig, “Femme Fatales,” p. 6.

9. See Comte 1988, pp. 1-33.

10. See Nietzsche 2003, especially his critique of Darwin’s (Utilitarian) evolutionary account of morality in group / community / social / kin selection via Paul Rée and the “English psychologists,” pp. 3-7.

11. See Foucault 1990, especially Part Five, “Right of Death and Power Over Life.”

12. See Szasz 1970, especially pp. 180-206.

13. See especially J. T. Bonner’s introduction to the abridged edition of D’Arcy Thompson’s *On Growth and Form* (1961), pp. xiv-xxii.

14. For example, see Kant 2000, pp. 245-246.

15. Kant 2000, p. 286.

16. See Kant 2000, p. 249.

17. See, for example, Kant 1997, pp. 656; 692.

18. Dawkins, 2006a, p. 264, my addition of the plural. See also Dawkins 1995.

19. Here, I am following Schrödinger 2012.

20. See Evan Thompson 2007, pp. 167-168.

21. Dennett in Haig 2020, p. 9.

22. Dawkins 2006a, p. 235.

23. Hume 2007, p. 53, my rephrasing.

24. Of course, their thesis is challengeable especially given that it may be seen to bifurcate the natural world into two types of thing: the animate and the inanimate.

25. Haig, “Femme Fatales,” p. 57.

26. See Pigliucci 2009.

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