

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

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A fascinating and thoroughly researched article on the role of teleology in 19th and 20th century biology. The story focuses on the reception of the concept in physiology, morphology, and evolutionary biology, and the different perspectives key figures in each field took on teleological theorising. Throughout, the central issues are investigated through the lens of gendered metaphors; teleology has variously been construed as a "barren virgin" or a "fertile mistress", alluding to its differing usefulness and alternative perceptions of its propriety within a naturalistic framework.

The article will be of great interest to (at least) historians of science, philosophers of biology, and evolutionary biologists. The issues remain relevant to contemporary biology. I here list a few suggestions that might serve to improve the piece:

1. There are probably a few too many block quotes as well as long quotes within the main text. I would cut down on these, especially in section 3.3 about Thomas Henry Huxley. His views are made clear by the author's prose and by a few select quotes. In this I agree with [the comment of Sophie Juliane Veigl](#). I note that the author has already responded to that review, so I leave this point simply to lend whatever further weight my opinion may carry.
2. It might help a wider audience to briefly introduce Aristotle's four causes, since much use is made of them throughout the article.
3. A distinction is made in section 3.6 that would usefully appear earlier: "between the final causes of organismic parts and the final cause of all things". The contemporary debate concerns the possibility and relevance of the former, so it will help to characterise the latter as a distinctly 19th century issue.
4. Again for audiences not familiar with biology, the definition (and etymology) of physiology could come earlier than section 5, for example in section 1 or 2, or even at the beginning of section 3.
5. "when Ludwig first used a revolving drum recorder to create a spatial record of temporal changes in an instrumented body" -- It's not clear what an instrumented body is, nor what it has to do with physiology.
6. "Huxley (1859b) excoriates Richard Owen for his invocation of a "spermatic force" and commented that the "groundwork of modern physiology is not a score of years old."" -- It's not clear to me what the problem with "spermatic force" is. Is it supposed to be a problematic *morphological* posit of Owen's? Or is the problem that Owen is illicitly importing a physiological concept into a morphological study? It's especially confusing because Owen was billed as anti-teleology, which this early Huxley is supposed to be too.
7. There's a confusing combination of sentences: "Huxley tends to use 'teleology' when referring to cosmic purpose but 'final causes' when referring to particular things. He rejected both final causes and teleology from scientific practice but

remained consistently agnostic—a term he coined—on cosmic teleology." I think "he rejected both final causes and teleology" in the second sentence should be just "he rejected final causes", since you've already made the distinction in the first sentence.

8. "Allusions to mistresses—with a nudge and a wink—now seem quaint and old-fashioned." -- I would add misogynistic and exclusionary. Here also I agree with the assessment of Sophie Juliane Veigl, and I urge the author to acknowledge the harm that can be caused by gendered (especially sexualised) metaphors. Doing so would not interfere with the status of the quotations as 'found objects'.
9. The final short paragraph of section 5 briefly mentions linguistics, but does nothing with it. I would end with the part about exaptation.

Some suggested references to philosophical literature include:

1. "No evolutionary biologist denies some role for natural selection but there are endless debates about its importance relative to other factors as sources of order and direction in the evolutionary process." -- This is nowadays an extremely important question in philosophy of biology (if not evolutionary biology itself), and three recent papers could be cited here: Okasha & Otsuka (2020), Zhang (2022), and Christie et al (2023).
2. Versions of the view advocated by Weber & Varela have recently been asserted by Montévil & Mossio (2015), Deacon (2011), and Walsh (2015), all of which (and more) are discussed by Nahas & Sachs (2023).

And some possible typos:

1. After the Bacon quote beginning "Another defect I note", his book is referred to as "Advancement of knowledge" where previously it was called "Advancement of Learning". Is this a typo or were there two different books?
2. Foster quote: "based largely on the philosophy of Oken". Should that be Owen?
3. There seems to be a verb missing in this sentence: "Scientific allusions to final causes as barren virgins petered out during the latter part of the nineteenth century as evidence for the demise both of arguments from design and invocations of vital forces (Lennox 1993)." Unless you mean that the allusions are evidence for the demise of the arguments, in which case I suggest rewriting the sentence to make the meaning clearer.

References

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