16th April, 2026

Abstract

An epistemic practice is the way a specific community goes about making and justifying knowledge.

Introduction

Your essay content starts here…

Topics I would like to cover

- Different biology practices culminating in Origin vs in SG
- Dawkins explains altruism through kin selection. How does Dawkins do this
- The Eclipse of Darwinism
- What Darwin actually argued and its metaphysical presuppositions / historical context and roots
- What Dawkins actually argued and its metaphysical / historical context
- Problem of evil

Similarity & Contrast

- Similarity
  - Both have been described as expounding a *cold, bleak message*
  - Both have been accused of having bleak social and philosophical implications.
- Contrasts
  - Darwin believed that most amount of competition is between similar organisms, whereas Dawkins believes in kinship-inspired altruism - this is quite a contrast
  - Darwin had the problem of dilution of inheritance, Dawkins doesn't have that by switching the unit of selection to the organism
- From reproduction to replication

Problem of Evil?

- Asa Gray considered natural selection to be the main mechanism of evolution and sought to reconcile it with natural theology. He proposed that natural selection could be a mechanism in which the problem of evil of suffering produced the greater good of adaptation.[1]

Introduction: Dawkins & Darwin Deep Dive

If only because they are widely considered the most influential biology books of the 19th and 20th centuries, respectively, a deep dive into Charles Darwin's *On The Origin of Species By Means of Natural Selection (1859)* and Richard Dawkins' *The Selfish Gene* (1976) seems compelling. The essay will further analyze what the two authors, Dawkins and Darwin, reveal about the epistemic practices in biology. We will trace the shift from the organismic theory to the genocentric theory of evolution as a way of "knowing" biology. We will be discussing the shift that biology took from having the organism as the primary study to having the gene as the object of primary study (where the organism is relegated to a 'vehicle').

I will argue that the shift from *Origin* to *Selfish Gene* represents a shift in the epistemic culture of biology, a shift from a Natural History[2] to ones focused on mathematics[3] Information Theory.

Personification as epistemic practice (Darwin and Dawkins)

In their writings, both Darwin and Dawkins make use of personification - the ascribing of intelligence and motivation to objects that don't have them. I argue that these kinds of

[1] https://en.wikipedia.org/wiki/The_eclipse_of_Darwinism

[2] See ways of knowing - maybe I can connect this to the 'natural-historical' way in the sense he means this

[3] Mention Hamilton

personification should be viewed as an epistemic practices responding to the changing demands of the field of biology between the 19th and the 20th centuries. Whereas Darwin appears to attribute intelligence and choice to *Nature*, Dawkins does the same to genes and *organisms*. Both Darwin and Dawkins use personification as both a didactic tool and a heuristic for professional biologists, that is to say, an epistemic practice. However, they also both stop well short of implying that this personification should be taken literally, thus defending this personification as an epistemic tool from literal-minded critics.

In her introduction to the 2009 reprint of Darwin's *Origin of Species*, Gillian Beer argues that Darwin *needs* a strongly personified view of Nature, going beyond a metaphorical one [1]. This is evident, for example, in the following passage:

> as man can certainly produce great results by adding up in any given direction mere individual differences, so could Nature, but far more easily, from having incomparably longer time at her disposal
>
> — Darwin, Origin of Species

Indeed, this passage appears to endow Nature with the agency to "produce great results". However, Beer doesn't make it clear what she means by "needs". If she means that Darwin's *theory* needs a strong personification of Nature, that is to say - that *Origin of Species* could not make its argument cogently *without* resorting to the personification of Nature as an *explanans*, I strongly disagree. Instead, Darwin's use of the metaphor as such is perfectly justified by his own explanation for it:

> So again it is difficult to avoid personifying the word Nature; but I mean by Nature, only the aggregate action and product of many natural laws, and by laws the sequence of events as ascertained by us.
>
> — Darwin, Origin of Species

In other words, the use of a personified *Nature* is not essential to the argument for natural selection, but serves merely as a useful shorthand for the many natural laws which lead to the survival of some and death of other species. This begs the question, if Darwin knew that the personification of Nature was a merely a convenient metaphor, why was he not more careful about avoiding passages like these in *Origin*:

> Nature acts uniformly and slowly during vast periods of time on the whole organisation, in any way which may be for each creature's own good
>
> — Darwin, Origin of Species

I can think of two reasons. First, as mentioned - it is a useful shortcut and thus a good didactic tool. A central part of the Origin of Species is to draw analogies between artificial selection and natural selection. By comparing Nature to a human breeder ("as man can certainly produce great results… so could Nature"), he uses the familiar to make the radical intelligible.

But there is another, perhaps more important reason why Darwin personifies *Nature* despite the risks of being taken literally. To understand that, we must turn to the social context in which Darwin was working. We have to understand that Darwin was addressing a broadly educated audience and writing as a popular science writer in addition to an accredited naturalist: Parts of *Origin of Species* have the lyricism that made *Voyages of the Beagle* of a huge success, whereas others read more like his dense technical writing in **The Structure and Distribution of Coral Reefs** or

the **Study of the Cirripedia**. He was thus ready to be met with moral as well as biological objections. In particular, the objection that Darwin's ideas were fundamentally more bleak than natural theology, which viewed "all manifestations of nature" as "aspects of a relationship between God and Man" [1]. Personifying Nature, therefore, helped soften the moral blow by maintaining the awesomeness of creation - replacing a real, active God with a personified, metaphorical Nature.

However, if Gillian Beer uses "needs" to mean that Darwin's everyday practice as a biologist led him to personify Nature, then I agree. In this case, we can view the personification of Nature as an epistemic practice typical of 19th century biology which has fallen out of favour (giving a way to the personification of genes and organisms in ways I shall detail below). Darwin undoubtedly used the personification of Nature in this latter way when formulating and refining his theory of Natural Selection. This is because the parallels that he saw between *natural selection* and *artificial selection* aren't merely analogies he uses to drive the point home to his Victorian audience, but it is how *he himself stumbled across the theory* (if we believe Darwin, and we have no reason to disbelieve his words on this point).

While Nature is elevated with metaphorical agencies, Darwin's organisms stay blissfully ignorant of their role in evolutionary change. We will see that the view presented by Dawkins is quite different.

By 1976, biologists no longer needed to "soften the moral blow" of natural selection, which was generally accepted as the main mechanism that explains the evolution of species. Instead, they needed tools to navigate the complex, data- mathematics, and computation-heavy practice of the Modern Synthesis of biology. Personification was one of these tools. Thus, Dawkins states that "natural selection for selfish genes tends to favour cooperation among genes", ascribing the (anthropomorphic) quality of cooperation to genes. Dawkins responded to accusations of his anthropomorphizing genes by arguing that "no sane person thinks DNA molecules have conscious personalities". He defends his hero D.W Hamilton's decision to "attribute to the genes, temporarily, intelligence and a certain freedom of choice" in explaining why the sterility of worker ants did not provide problems with evolution [2]. Moreover, he argues that personification of this kind is not "just a quaint didactic device" - in "Darwinian calculations of altruism and selfishness [...] it is very easy to get the wrong answer. Personifying genes, [...] often turns out to be the shortest route to rescuing a Darwinian theorist drowning in muddle". Thus, the *personification of genes* becomes an epistemic practice to short-cut the complex mathematics involved in the computation of relative gene frequencies. But Dawkins does not just personify genes; organisms get the same treatment. On page 168 of the *Selfish Gene* we find him arguing :

> As soon as a runt becomes so small and weak that his expectation of life is reduced to the point where benefit to him due to parental investment is less than half the benefit that the same investment could potentially confer on the other babies, the run should die gracefully and willingly. He can benefit his genes most by doing so.
>
> — Selfish Gene, p168

Here, Dawkins is not literally describing the internal mental state of the runt. Instead, a gene-centric theory of evolution implies that animals have been loaded with instincts which function *as-if* they were constantly maximising their chance of passing on their genes. Thus, the *personification of the organism* acts as another epistemic short-cut (just like the personification of the gene), allowing the biologist to quickly arrive results that would be impossibly laborious and error-prone to achieve with mathematical modelling. The runt's personification is really a product of the genes that it makes up, which themselves are personified, as we saw:

> A gene that gives the [runt] the instruction, "Body, if you are very much smaller than your litter-mates, give up the struggle and die" could be successful in the gene pool, because it has a 50 per cent chance of being in the body of each brother and sister saved.
>
> — Selfish Gene, p168

So, both Darwin and Dawkins use personification both as an epistemic practice as biologists and as a didactic tool for their readers. Whereas Darwin was carefully anticipating the perceived incompatibility of evolution and Victorian Morality, Dawkins does not have these sensitivities to modern-day moral objections to Darwinism: "If something is true, no amount of wishful thinking can undo it" [3].

In Defense of *Origin of Species* as a popular science book

At first it may be objected that we are unfairly comparing an original contribution to science (*Origin*), with 'merely' a popular, though influential, science book (*Sefish Gene*). But this would be a misunderstanding of both books: Despite revolutionizing the field, Darwin's *Origin* had as a target audience of both expert naturalists and a broad, educated public. As Gillian Beer writes, Darwin wanted his ideas to be "available simultaneously to Darwin's fellow-workers in science and to any educated person" [1, p. viii]. Similarly, Dawkin's *Selfish Gene* did not merely try to popularize ideas already swirling around in biology circles. He clearly targeted.

Miscellaneous notes on Darwin's origin of species

Darwin's *Origin of Species* is a work full of contradictions. It written for non-specialist readers and yet had a profound impact on biology. Although its main purpose was to explain the mechanism of natural selection and argue for its centrality in evolutionary change, the main impact of the book was to increase acceptance of species transmutation - the centrality of natural selection remained a minority view in biology until the 1930s.

Darwin's theory was pithily captured in the "Instinct" chapter

Darwin's book proposes "one general law, leading to the advancement of all organic beings", which he called "natural selection", pithily summarized as "multiply, vary, let the strongest[4] live and the weakest die." [4, p181, ch7]. It is commonly argued Dawkins applied this logic but substituted the *organism* for the *gene*. However, as Dawkins clarifies in the Introduction to the 30th anniversary edition of the Selfish Gene: "there are two kinds of units of natural selection, and there is no dispute between them. The gene is the unit in the sense of a replicator. The organism is the unit in the sense of the vehicle. Both are important. "

Introducing the Selfish Gene

The *Selfish Gene* can be understood as the most successful popular account of the Modern Evolutionary Synthesis of the 1930s and 1950s.

[4] As the rest of Darwin's writings make clear, *strongest* should be taken to mean *best adapted to its environment*, which could mean the *most camouflaged* or the *most cooperative* depending on the situation!

Naming Woes

Darwin does not need a strongly personified Nature for any explanatory reasons, but he does need them in a (failed) attempt to quell public backlash

Commentators mistake the centrality of symbiosis to Darwin's view of life

> 'Let it be borne in mind how infinitely complex and close-fitting are the mutual relations of all organic beings to each other and to their physical conditions of life'

Bibliography

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[2] W. D. Hamilton, "Altruism and Related Phenomena, Mainly in Social Insects," *Annual Review of Ecology and Systematics*, vol. 3, no. 1, pp. 193–232, Nov. 1972, doi: 10.1146/annurev.es.03.110172.001205.

[3] R. Dawkins, *The selfish gene*, 40th anniversary edition. in Oxford landmark science. Oxford, United Kingdom: Oxford University Press, 2016.

[4] C. Darwin, *On the origin of species*. in Oxford World's Classics. London, England: Oxford University Press, 2008.