

Epistemology, necessity, and evolution: a critical review of Michael Ruse's *Philosophy After Darwin*

Carlos Mariscal

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Abstract Michael Ruse's new anthology *Philosophy After Darwin* provides great history and background in the major impacts Darwinism has had on philosophy, especially in ethics and epistemology. This review focuses on epistemology understood through the lens of evolution by natural selection. I focus on one of Ruse's own articles in the collection, which responds to two classic articles by Konrad Lorenz and David Hull on the two major forms of evolutionary epistemology. I side with Ruse against Lorenz's account of the necessity we think our principles of reasoning have, though I disagree with Ruse's particular example. I also argue that Ruse's alternative explanation is lacking. Against Hull, I side with Ruse in his doubts that a sociobiological approach to science will prove fruitful, though I point out that it has certain advantages other approaches do not have. Although I side with Ruse on the issue, I conclude that the two views do not really come into direct conflict and so one needs not reject either. Finally, I discuss Ruse's positive view and raise questions for his conception of evolutionary epistemology. I conclude that his arguments are insufficient to overcome opposing views and his view has at least as many unintuitive conclusions as the alternatives.

Keywords Evolutionary epistemology · Darwinism · Epistemology · Sociobiology of science

Introduction

Philosophers of biology often work to show the insight philosophy has to offer biology. The reverse is far less common. This is why Michael Ruse's recent anthology *Philosophy After Darwin* finds a niche so readily available. Ruse is one of

C. Mariscal (✉)
Duke University, 201H West Duke Bldg., Box 90743, Durham, NC 27705, USA
e-mail: carlos.mariscal@duke.edu

the most influential philosophers alive, having written or edited some 40 books. This new anthology calls attention to well known, forgotten, and ignored yet valuable works in the history of philosophy the way only Ruse can. A major theme and the focus of this review will be evolutionary epistemology through the lens of an article in the anthology by Ruse himself.

All of the articles in *Philosophy After Darwin* have been published previously or are distillations of previously published works. That said, Ruse should be commended for bringing some of these articles to light after decades of them remaining obscure in the annals of philosophy. The anthology is divided into six parts: Epistemology after Darwin, Ethics after Darwin, the Evolution of Ideas, the Evolution of Rationality, Ethics and Progress, and the Evolution of Altruism. The first two sections focus on the 50 years following the publication of the first edition of *On the Origin of Species*. These give a sense of the immediate impact Darwinism had on the intellectual community at the time. The explicit racism and nationalism of some of these early articles leaves a sour taste, but this is mitigated by the seriousness and impact of the issues considered. Ruse includes works by Frederick Nietzsche, Charles Sanders Peirce, William James, John Dewey, G.E. Moore and T.H. Huxley. Though the article selection for the first two sections seems haphazard, each of those names informs and influences many of the subsequent papers in the anthology. Nietzsche's critiques of progress in evolution shows its influence in later discussions by Bertrand Russell cited by Ruse as well as Konrad Lorenz and Alvin Plantinga. The pragmatist influence and responses to it unfold through the third and fourth sections in the words of Karl Popper, Thomas Kuhn, Hilary Putnam as well as Ruse himself. Spencer notices links between Kant and Locke in a Darwinian context that are restated by Lorenz, Ruse, and the evolutionary epistemologists after them. More obviously, G.E. Moore is key to understanding any naturalized ethics in the twentieth century.

Following the first two sections, Ruse highlights papers that explore epistemology after Darwin. The Evolution of Ideas section is meant to highlight those who view epistemology in a progressive world picture while the following section shows those who would base epistemology on the results of natural selection shaping human minds. Beside a co-written paper, there are two of Ruse's own previously published articles in this book. The first article on evolutionary epistemology will be the focus of much of my review, though both are extremely worth reading. Ruse's articles are the key to this compendium. Many of the works these articles cite are the very works Ruse has included in this anthology. As such, they give a clearer idea of the connections and ideas these articles present. Let me turn now to two articles that precede and inform Ruse's own.

Kant and contemporary biology

Nearly 70 years ago, Konrad Lorenz argued that natural selection would vindicate Immanuel Kant by reinterpreting the a priori as evolutionarily selected modes of understanding. The ground that Lorenz tread is fascinating and was altogether novel in its time though it did not come to be widely known in the English world for

several decades. Campbell (1974), who coined the term “evolutionary epistemology,” gives credit for the idea to Karl Popper. Lorenz and Popper were born one year apart in the same part of Austria and it is possible that Lorenz first learned about Kant from Popper himself. Popper, however, is more properly the father of Hull-style evolutionary epistemology or what Michael Bradie (1986) calls the evolutionary epistemology of theories program (EET). This is contrasted with Lorenz’s approach, which is more aptly called an evolutionary epistemology of mechanisms (EEM). Lorenz’s argument is roughly that our categories and modes of understanding come from our species’ evolutionary struggle against a true objective nature, the ‘thing-in-itself.’ Clearly, Lorenz is a realist. The central question for Lorenz is “Would not the laws of reason necessary for a priori thought be entirely different if they had undergone an entirely different historical mode of origin, and if consequently we had been equipped with an entirely different kind of central nervous system? Is it at all probable that the laws of our cognitive apparatus should be disconnected with those of the real external world?” (p. 231) Our minds conceive in terms of substance, causation, and other categories because it was advantageous to our ancestors to do so. This much would put him on par with the pragmatists, but Lorenz goes further. He holds that these categories were advantageous because they—likely—are correct. Our modes of a priori thought, then, are not necessarily part of what all rational agents hold as Kant would have, nor simply a reflection of the true world, but an adaptation that approaches the truth.

Although Lorenz takes this to be what the Kantian line should be in the twentieth century, it’s not clear Kant would recognize this approach, as he sought a deeper metaphysical import of these categories and forms—what all rational agents would interpret upon being confronted with reality. Lorenz takes evolutionary biology to show that this is naive: humans experience the phenomena they do for a historically contingent reason:

With regard to the absolute validity of our “necessities of thought” we are accordingly models: We believe only that in some details they correspond more to the actually existent than do those of the water shrew. Above all, we are conscious of the fact that we surely are just as blind in regard to as many additional things as that animal is: that we too are lacking the receptive organs for infinitely much that is actual. The forms of perception and categories are not the mind, but rather are tools the mind uses. (p. 245)

How humans interpret the world around them will also be similarly contingent. A consequence of this is that the human understanding of nature is not privileged in any deep way. It might not even coincide with the categories and forms of other rational agents. Yet Lorenz still is following in the positivist tradition by insisting that progress can be made. Lorenz argues that research of appearances that have arisen through different evolutionary means could bring us closer to comprehending the ‘thing-in-itself.’

While Lorenz’s argument takes quite a bit of exposition, it is nevertheless fruitful. It will not straightforwardly appeal to non-realists, but even accepting realism will give Lorenz problems, as Ruse points out in “The View From Somewhere.” Lorenz claims to be able to get Kantian-style necessity from the

extremely long evolutionary time that led to rationality. According to Lorenz, the denial of such necessities is not merely inconceivable to us humans; it also would be inconceivable to any creature that evolved from humble beginnings to our level of intelligence. Ruse's response is essentially that Lorenz cannot ignore Nietzsche's worry: evolution is pragmatist. Whether something is true or not is irrelevant, what matters is the effect it produces. If a perception or mode of understanding produced successful responses, it would nevertheless evolve. Consider the category of causation. Ruse gives a counterexample of an alien race that believed pain was a sign from the Gods to avoid a certain action. In this race, if an alien were to place its hand in a flame, it would withdraw its hand instantly because it felt pain and it believed that the Gods were the cause of this. I take Ruse's concern to be well founded, but this counterexample fails. Ruse has not given an example of rational creatures that do not have the category of causation. All he has given is an example of rational creatures that insist on a middleman for their analyses of causes. No doubt humans do that often enough. But Ruse's point is deeper than his mere objection. Lorenz and each evolutionary epistemologist that follows in his line is in the bind Nietzsche pointed out half a century earlier. Evolution is a process of the survival and proliferation of the more adaptive strategies: Ruse's example is meant to show that a creature could be rational and perform all the same actions without understanding the world in the same way. Lorenz had made the same point originally, but concluded that this could be overcome by what one could call comparative phenomenology. The idea is that as our data set increases, we will be more likely to approach an accurate description of the 'thing-in-itself' and the correct modes of inference, categories, and laws. No doubt this is too positivistic for most practicing philosophers. Most of us accept that observation is more theory-laden than Lorenz assumes and that the data set will still be underdetermined. Philosophers who do not accept this should feel free to continue Lorenz's project.

Another evolutionary epistemology: sociobiology of science

David Hull pursues the 'other' evolutionary epistemology (EET) in an article in which he argues for a sociobiological approach to studying science. Hull's approach is straightforward: he studies science as a field in terms of individual and group forces acting to motivate individuals. As his data he includes the observation of how little plagiarism and falsification science has relative to other comparable disciplines. He views this in an evolutionary light as altruism because it seems that plagiarism and falsification are in an individual's most immediate self-interest if not caught. Yet science seems to regulate itself with a fierceness that is unseen in other disciplines. Plagiarizers are discredited and falsifiers are reviled and punished. Hull notes that in daily interactions, both of these would be equally morally condemnable, but in science, the latter is viewed much more harshly than the former. To explain this, Hull notes that the commodity in science is essentially the respect of peers. These peers earn respect by promoting views and gathering data such that the field as a whole is advanced, and they are credited with the original

contribution. Each individual has an incentive to advance the field in order to gain this respect, but to do so they must rely on the observations and insights of other scientists. Since plagiarism only hurts the plagiarist, whereas falsification actually derails the pursuit of knowledge and other scientists' work, then it follows that other scientists would punish more harshly frauds than plagiarists. All of this is consistent with his sociobiological analysis and even predicted by it.

Hull seems to have a more concrete model for cultural evolution than some other discussions of memes. For example, earlier in the anthology, an article by Edmunds challenges memetics to produce (1) a conclusive case study, (2) a theory for when the use of meme models are appropriate, and (3) a simulation of the emergence of a memetic process. Hull's EET has a very real chance of doing this. Firstly, EET units are not abstract concepts that are passed along from individual to individual, but rather strategies in which individuals engage in order to maximize their own fitness. As such, Hull can provide concrete examples and case studies of when humans act in the ways of models and evolutionary game theory. Some work could also be done to give an answer to the third critique. So *prima facie*, Hull's approach seems fruitful. Ruse does not think this withstands analysis, however, due to the fact that conscious action comes into play for sociobiology. Science seems directed and teleological in a way that biology does not. A scientist formulating a theory is consciously attempting to get to the truth. He doesn't blindly try variants of theories in the way the biological analogy would suggest. Hull, to his credit, addresses the issue in another work by pointing out that

Intentionality is close to necessary but far from sufficient in making conceptual change in science progressive. It is not absolutely necessary because sometimes scientists have made what turn out to be great advances quite accidentally... Conceptual evolution, especially in science is both locally and globally progressive, not simply because scientists are conscious agents, not simply because they are striving to reach both local and global goals, but because these goals exist. (2001, pp. 118–119)

At times it seems that Ruse is making too much of the disagreement between the two positions. First, it's not clear EET and Ruse's evolutionary epistemology (EEM) have any natural intersection as they don't purport to explain the same phenomena. Hull's work is on the evolution of ideas while Ruse focuses on the historical necessity or contingency of the evolution of rationality. The bulk of Hull's approach could be held fast while accepting Ruse's observations. Hull himself seems to make Ruse's point in the passage I cited. Hull then continues as if his view is unaffected. Ruse expresses concern about this, but is unclear why. Ruse seems to view the progressiveness of science as a deathblow to the analogy between the evolution of science and the unprogressive evolution of biology. Ruse argues that if the analogy is not accurate, then pursuit of similarities will be unfruitful. Hull agrees, it seems, but thinks that the conclusion does not follow. Whether the quoted passages are bad thoughts, incomplete thoughts, or simply infelicitous phrasing is unclear. Without clarification and further argumentation, the issue is at an impasse. The saying "one philosopher's *modus ponens* is another's *modus tollens*" is particularly apt here.

Ruse's evolutionary epistemology

We've already discussed much of Ruse's own views in response to Lorenz and Hull. The following view will flesh out his position further and view it in the light of 20 years worth of work on the subject. Ruse begins with the reminder that Darwinism shows the human mind is not born a blank slate, but is rather imbedded with various capacities, constraints, and dispositions that have evolved. The observation is obvious but clearly needs to be fleshed out before any conclusions can be reached. Ruse follows E.O. Wilson and Charles Lumsden's terminology by calling these capacities "epigenetic rules." (Lumsden and Wilson 1981, p. 237) The connection Ruse makes to epistemology, then, is through the rules and criteria used by scientific investigations. Ruse notes that science is not random, but clearly and methodologically pursued. This could be explained in Hull-like terms of the sociobiology of scientific practice through human history, but Ruse takes a different approach. He takes the rules of scientific methodology to be at least partially innate rather than purely learned. And these innate rules tie into the epigenetic rules he thinks our minds all share:

I argue that these rules and criteria used by the scientist are not subjectively decided on by the individual scientist, nor even by a group of scientists. Neither are they reflections of absolute reality or some such thing. They are rather the principles of reasoning and understanding that we humans use because they proved of value to our ancestors in the struggle for existence. (p. 252)

This passage will sound more controversial to laymen and average philosophers than many biologists or philosophers of biology. Where Ruse's view gets more controversial is in discussing the 'necessity' of these epigenetic rules. We'd seen this aspect earlier in the discussion of Lorenz. Ruse thinks the Kantian approach is ultimately unable to provide the 'necessity' we seek from our categories. There could be no principled reason to think our rationality inevitable in an evolutionary context. Evolution is neither progressive nor is there a principled reason to think our sort of rationality is the sort all rational beings would have. Instead, Ruse takes himself to be in the Humean tradition. In this conception of evolutionary epistemology, 'dispositions' or epigenetic rules govern our thinking. This gets to the 'necessity' in a very peculiar way: by denying that rational beings elsewhere would disagree with our rules of thinking. If anything, they might just not think in the same terms as us. No rational beings would reject $5 + 7$ equaling 12 or that causal claims don't hold. Rather, insofar as they disagreed, it would be because they did not think numerically or causally at all.

[I]t is not necessary to have our principles of reasoning in order to be rational, but if you do think in our sort of way then you cannot deny the truths that we believe. To deny our truths is to think our way, but incorrectly. (p. 268)

This is an interesting approach to the problem, but it seems vacuous. If some rational creature does not agree with us, it must be wrong or its principles of reasoning must be incommensurable with ours. But why could Ruse's own example

not be used here? Suppose the alien race believed that their Gods forbade only flames, all other pain they felt was just pain. In fact, let's suppose that every other principle of reasoning they would use would be exactly the same as ours. Would Ruse take this to be an example of wrong reasoning or simply a different set of dispositions?

Part of why Ruse is pushed to take this line comes from his care to shy away from 'progress' language. Evolution is not progressive, at least not in the conventional sense of progress. This was the attack he leveled against Hull's EET program. In Ruse's own evolutionary ethics, he must also beware thinking in terms of progress. There is no reason to assume rationality would evolve toward an ideal rationality that reflected the world as it truly was using logically valid inferences. Other evolutionary epistemologists have not been so careful in this regard. But Ruse is not careful in that he is never clear in what innate epigenetic rules he means. The suggestions he gives of logic, mathematics, and rules of scientific methodology seem to work against him. He gives that cluster on p. 253, and then remarks three pages later that humans are less prone to using logical inferences than we'd expect and that humans don't think in the way the methodologists of science suggest they do. This is frustrating as either case, if true, would be interesting evidence for epigenetic rules of some sort, but the two are mutually inconsistent. This is a misstatement and detracts from his argument.

The final aspect of Ruse's view is his denial of a reality beyond experience. Ruse thinks it makes no sense to speak of a reality that lies beyond our comprehension and necessarily remains so. The evolutionary epistemologist, Ruse thinks, cannot accept such a claim, because it would add nothing to his theory. To posit a 'real' world, a 'thing-in-itself' is redundant and senseless. Ruse does not provide an argument of his own for this although he has in other work. Instead, Ruse cites Andrew J. Clark (1986) who poses a dilemma for the evolutionary epistemologist: either accept that all models are models of some indescribable world-in-itself or refuse to accept any conception of reality beyond that which is said to exist in some successful model. The first option seems to replace the world-in-itself with many species-specific descriptions, while the second keeps the world-in-itself but has it supervene over all descriptions of it. Clark argues that this divorces the science from the description of noumenal reality and Ruse agrees. I don't have much to add except for the observation that this strategy is not unique to evolutionary epistemology; it could be used against realist views of science in general. Ruse takes a position on this because he was committed to it ahead of time, but an evolutionary epistemologist could remain silent on this issue altogether.

Progress, altruism, and concluding remarks

The final two sections of this anthology, *Ethics and Progress* and *the Evolution of Altruism*, show some worthwhile work in relating evolution to ethics. First up is the notion of progress in evolution. We've seen this already in the preceding discussion, but progress tends to also come with value judgments. That is the focus of this section. This idea of progress in evolutionary is as old as evolution itself and seems

to continually reemerge in different guises. In the first and second sections of the anthology, we see how it arises in a Darwinian context in Spencer and the Social Darwinists or ‘first wave’ evolutionary ethicists. It reemerges with the rise of sociobiology in the 1970 s. E.O. Wilson, perhaps the best proponent of the approach, was convinced that it would also shed much insight into the deeper questions in philosophy like reductionism. Also noteworthy in the section are the Ruse and Wilson article, which is too cagey and ambiguous in key issues, but worth reading if only to understand Philip Kitcher’s response in ‘Four Ways of ‘Biologizing’ Ethics’”

Lastly, the final section is on the evolution of altruism, which has been a very popular topic in recent years. Marc Hauser has an article that seems to reify the points he makes in his book *Moral Minds* about a ‘universal moral grammar.’ Elliott Sober and D.S. Wilson have a precis of their 1998 book *Unto Others*, which is a worthwhile read on its own. Richard Joyce, Zach Ernst, and Peter Singer also have key articles in this section.

For the most part, Ruse’s introductions to the various sections are spot on and give an exemplary historical grounding for readers. The latter sections build and expand on the former, giving context, subtext, and consistency for the influence of many of the authors in the early sections. There is a very serious effort to connect the threads of post-Darwinian influences. Ruse spots many of the threads I’ve mentioned, but certainly is aware of the rest. Other insights pepper these introductions. It is a worthwhile book that all philosophers of biology should have in their library. That said, it might not be particularly effective to teach a course—even a graduate level course—to this anthology. It is simply too thorough on too many subjects to fit any semester-long syllabus. However, sections of the anthology could be easily incorporated into any number of courses. Nearly half of the anthology would be perfect for a course on post-Darwinian ethics while the other half could easily serve as a great introduction to evolutionary epistemology. Some final words on the latter are in order.

I’ve given a brief summary and rejoinder to one of the central threads Ruse finds in philosophy after Darwin. Herbert Spencer first wrote about the link between Darwin and both Immanuel Kant and John Locke. Locke, Spencer concluded, was wrong, but Kant was not entirely right either. Konrad Lorenz pursued this connection decades later and attempted to show where the Kantian position was left after Darwin. Our a priori thoughts are not prerequisites for rationality, but rather the result of eons of selective pressures by the environment. Lorenz was a dyed-in-the-wool realist, but his philosophy is doomed to conventionalism if he cannot show why a priori intuitions are necessary and not merely historically contingent. His response is less than appealing, but the view was intriguing. Ruse’s response to this view was to take a Humean stance with regard to ‘necessity.’ It is necessary in our species’ minds, but if another species were to dissent, they would not be referring to the same epigenetic rules. My response was that it is unclear whether we all hold the same, consistent epigenetic rules and that it seems circular to doubt another species could not refer to our inferences while insisting that we all have the same access due to our evolutionary path. Ruse also doubts the objective reality of the world, which he feels follows from his evolutionary epistemology, but this argument is the same

that could be leveled at scientific theories in general. As such, the evolutionary epistemologist should not be any more motivated to doubt an external world than any other scientist.

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