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Replies to the Critics

Roger M. White, M. J. S. Hodge, and Gregory Radick: Darwin's argument by analogy: from artificial to natural selection. Cambridge: Cambridge University Press, 2021, viii + 251 pp, \$99.99 HB

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We are immensely grateful to *Metascience* for sponsoring this symposium, and to our reviewers for their splendid contributions. Although we wrote the book in one voice, we are going to respond now in our individual voices.

From Roger White:

I should say at the outset that my role in this book was very different from that of Greg and Jon. They are both Darwin scholars, but I am an analytic philosopher who has done extensive work on analogy and metaphor. I have acquired a reasonable working knowledge of the *Origin* while preparing this book, but my contribution has primarily been on questions concerning the use of analogy and metaphor.

Andrea Sullivan-Clarke has perhaps underestimated the difficulty in determining the way that commentators on the *Origin* have understood Darwin's argument. What will be apparent to everyone is that in the opening chapters Darwin is comparing artificial and natural selection, and so may be said to argue by analogy. However, it was almost never possible to determine how commentators understood the argument. The default assumption

was that a commentator on the early chapters of the *Origin* thought that the argument followed the pattern outlined by Reid. Such an account was overwhelmingly the most popular, with only a minority of people, usually who had made a special study of the topic of analogy, who insisted on retaining the original meaning of the word. This is not because arguments by analogy in the classical sense are rare: they are as common as Reidian arguments. However, the point here is not that such examples are overlooked, but that there is a failure to appreciate that proportionality has made possible a different kind of argument from that outlined by Reid. In this way there is the assumption that there is only one kind of argument by analogy and every example of an argument based upon comparing two situations can be adequately described along the lines outlined by Reid. Two types of argument, with completely different forms, are run together. The significance of this is that the classical argument is a much stronger argument which, properly conducted, can amount to a proof. At the same time, the classical argument is tricky to handle, and Whately, for example, will spend as much time examining cases where the argument goes wrong and is used to make an illegitimate inference. For instance, one of Whately's examples that is still familiar today is arguing for a way that a country ought to manage its economy by analogy with the way that a family ought to manage its economy. What initially interested me in the detailed text of the opening chapters of the *Origin* was not only that these chapters presented a clear example of a classical argument by analogy, but that Darwin gives a near perfect one in which he does not put a foot wrong.

I am pleased about the extent of the agreement between the treatment of metaphor in our book and David Depew's remarks. Thinking this through, I was struck by a curious fact: in the case of the two key ideas central to our accounts—that successful metaphors are based on analogy, and the role of metaphor in the formation of new concepts—we are concerned with ideas first raised, at least embryonically, very early on, specifically by Aristotle and

Quintilian; and yet the power of these ideas has been completely ignored by the overwhelming majority of modern philosophical theories of metaphor. The reason, I believe, can be found in the difference in the approach to the question of metaphor, then and now. For both Aristotle and Quintilian, the question was practical: why use metaphor, and what makes for a successful metaphor?, whereas recent philosophical treatments of metaphor have been concerned with a theoretical question of the place of metaphor in accounts of the way language works. As a result of the latter concern, there has been a tendency to simplify the task by concentrating on metaphors of extremely simple linguistic structure and banal content, with the assumption that we can regard the truly complex and interesting metaphors as “somehow” extrapolations of what we find in the simple cases, so that the key ideas of Aristotle and Quintilian are completely overlooked. To turn to the *Origin*, it is when you approach the text with the question “What is the function of Darwin’s metaphors in the presentation of his argument?” that the strength of the claims of Aristotle and Quintilian become apparent, as we argued in Chapter 6. Nothing seems to me as more misguided than Levine’s remark that “the texture not of scientific tract but of literature” (Levine 2011, 86).

I am also gratified by Andrew Inkpen’s initial comments about our book. On the “Broader Interpretive Issues”: for the most part these are dependent on detailed questions of what Darwin and Wallace thought and when—questions that Jon and Greg are much better qualified than me to discuss. Instead, I shall concentrate on Darwin’s claim that there was no clear distinction between well marked varieties and the emergence of new species. Inkpen seems to see Darwin as sceptical as to what was and what was not a species—and hence as sceptical about what, according to its title, his book is about! But this is too hasty: instead, he should be seen as claiming that species concepts are vague concepts. As a result of evolutionary theory, there are no longer sharp boundaries separating the species, as they would be on a creationist account: instead, we would have a sequence of more and more

marked varieties, which eventually form a new species, without there being a definite cut off point. This is not a form of scepticism. It is compatible with there generally being clear answers to questions about what species an animal belongs to. Compare: the colours of the rainbow, where there is no sharp boundary between orange and red. Instead, we move from clear-cut orange to reddish orange, then to orangish red, and finally clear-cut red. It is impossible to specify the precise point at which reddish orange becomes orangish red, but there is rarely any difficulty telling whether a shade was or was not red. Without there being a set of different species, with clear answers to questions as to which species animals belong, Darwin's key idea of a tree of life, with the different species forming the branches of such a tree, would collapse. I do not find Darwin's claim that species were what naturalists call species "deflationary." There is a long history stretching back to Plato in which the animals belonging to a particular species would have a definition giving necessary and sufficient conditions for membership of that species. But given Darwin's theory of evolution, there is absolutely no reason why such definitions should exist. All we can say is that a species is an evolutionarily stable branch of the tree of life, but what the creatures belonging to such a species will be like is completely unpredictable (and to that extent "arbitrary"). Therefore, what the species are and what they are like is an empirical matter to be settled, if at all, by fieldwork to be left in the hands of competent naturalists.

From Jonathan Hodge:

To begin with Andrew Inkpen's review: the first thing to say is that its first seven paragraphs are music to all of our six authorly ears. So accurate and lucid is Inkpen's grasp and acceptance of our book's aims and conclusions that we are thinking we should get our publisher to include these paragraphs in future publicity for the book. No less cheering is

reading David Depew's and Andrea Sullivan-Clarke's pages and finding there is no conflict with Inkpen's opening paragraphs. Overtly or tacitly, then, all three reviewers express no direct disagreements with the book's main theses—something we are very glad about.

However, the remainder of Inkpen's review raises queries adding up to a gentle but unequivocal dissent from what we have to say about Darwin's take on art-nature relations. He argues in his three closing paragraphs that Darwin re-envisioned these relations through his treatment of domestication and natural selection. Darwin, he reminds us, often wanted to lessen the gap between humans and nature by showing that traditional human abilities, activities and creations differ only in degree from those found in nature, and that selection is one such activity.

So far so good perhaps. But Inkpen then moves from selection to domestication, and Darwin writing on ants that keep, care for and milk aphids as farmers do cows. There is, however, no hint here from Darwin that the ants are *selectively breeding* their aphids, and so no discrediting of any "essential difference between selection serving the human good and selection serving the good of the organism," in Inkpen's phrase. What the ants and aphids show is that there can be domestication without selection, artificial or natural. Domestication as such is about costly keeping and caring so as to get the exploitative benefits. Yes, the domesticators may breed the domesticated selectively, but that is not a defining feature of all domesticators' lives.

From Darwin's earliest notebook analogising about artificial and natural selection, what was decisive was the fundamental asymmetry in his analogy: he was learning about all nature, including pre-human nature, by reflecting on a human art. The art was his model to be learned from, nature was the target to be learned about; and this learning was grounded in a causal proportionality that supported arguments by analogy. This grounding did not require any merging of model and target as a corollary of a metaphysical merging of man and nature.

Certainly Darwin did more merging of man and nature than many of his contemporaries were inclined to do. Wallace is the most instructive example. After he had read the *Origin* he joined Darwin in upholding the analogy and its Malthusian grounding. His later spiritualist unmerging of man and nature required him only to exempt our species' mental life from natural-selectional explanations. In *Darwinism*, that unmerging is confined to one part of the last chapter (Wallace 1889). It is not mentioned in the opening chapters where the theory of natural selection is comprehensively expounded, including its support from the selection analogy.

In the final chapter of our book, we discuss art-nature relations as very differently understood by Aristotle, by Boyle and by German Romantics like Schelling. And we argue that Darwin's eventual take on these relations—his analogical-Malthusian-agrarian take—matches none of these three precedents. I expect us to be challenged on our case for this conclusion.

David Depew shares our conviction that modern science has often to be understood historically and philosophically by considering how it relates to ancient classical traditions. I recall being impressed when as a graduate student I learned that, according to some sources, the *Origin's* most hostile and prominent zoological critic, the Swiss-American Louis Agassiz, reread Aristotle's biological works every year—in Greek—in order to maintain his resistance to Darwin's teachings. Needless to say, Depew's motivations for juxtaposing Aristotle's Greek and Darwin's English are quite different. For, as his heading implies, what he sees as ancient in Darwin is analogy as proportionality, while what is modern are the concatenated metaphors supported by analogies that have been, in turn, suggested by metaphors.

There may be a hint here that what is primary and strongest is what is oldest and what Aristotle and Darwin share: their teleology and their adaptationism; while what is less strong is what is most novel and unprecedented: the metaphorical, Malthusian selectionism. More

abstractly one might read Depew as hinting at a contrast between hard, ancient geometrical science, including probative, demonstrative analogy as proportionality and soft suggestive rhetorical modern metaphors. However, our book does not, I think, condone such a contrast and Depew shows no sign of wishing that it did. We and he see analogies supporting metaphors and being suggested by them; and seeing these analogy-metaphor complexes as constituting argumentation essential to the one long argument of Darwin's whole book,

In our concluding chapter on wider issues in Darwinian science we introduce several historically-instructive figures such as Adam Smith and Sewall Wright. More historiographically, we are often disagreeing with those authors, such as Ernst Mayr and Robert Young, and Michael Ruse and Robert Richards, who have dominated broad-brush Darwinian studies in recent decades. None of our three reviewers has come to their defence, but we expect to be challenged in due course by others.

Coming finally to Andrea Sullivan-Clarke: she is entirely right in suggesting that our project could well have included the treatment of the analogical issues raised by Darwin's critics. Her choice of Mill to focus on is especially appropriate, not least because the Mill-on-Darwin story is such a complicated and even exasperating one. What is more, as David Hull never tired of pointing out (see, e.g., Hull 2009), Whewell, Herschel and Mill between them published only a tiny total of words about Darwin's alternative to all intelligent design options. Mill's preference for intelligent design was moreover only explicit in a posthumously published essay collection.

Hull implied that these three philosophers of science had no excuse for this failure to say more about Darwin's theorising, but he did not develop this notion. On Mill in particular, I would love to see some hyphenated HPS person devote a detailed study to going on from where Hull left off, and where Sullivan-Clarke is now leading the way. This much-needed future study will, we hope, take on board a reflection we offer near the end of our book: that,

despite the radical novelty of Darwin's proposals in the *Origin*, the elements of his epistemic ideals—notably, as we stress, *analogia*, *a fortiori* and *vera causa*—were not novel at all, and routinely familiar to cognoscenti, notwithstanding those mistakenly overheated claims made since by Dewey and others that Darwin was doing science in unprecedented, mould-breaking ways.

From Gregory Radick:

“Another thing gives me confidence viz. that some who went ½ an inch with me now go further, & some who were bitterly opposed are now less bitterly opposed.” Thus wrote Charles Darwin in his letter of 2 December 1860 to Thomas Huxley, just after the passage quoted by Andrea Sullivan-Clarke. In a similar spirit, we take heart that, among the distinguished contributors to this review symposium on our book, we find instances of both categories of intellectual movement. Previously, Sullivan-Clarke published an important—indeed prize-winning—defence of the general position we defend: that Darwin's *Origin* argument from artificial to natural selection really is, as it seems to be, an argument by analogy (Sullivan-Clarke 2013). Now, in support of our new identification of that argument as belonging to the tradition of analogy as proportion, she has made us the gift of a perceptive quotation which we had missed—and from none other than the most thoughtful Victorian philosophical commentator on arguments by analogy, John Stuart Mill. On the other, oppositional side, there is Andrew Inkpen. He formerly expressed doubts about whether Darwin's argument is an argument by analogy (Inkpen 2014), but now generously declares our case convincing, even providing what my co-authors and I regard as a superb précis of our analysis, down to an exemplary contrasting of Aristotelian analogy as proportion with Reidian analogy as similitude.

Of course, Sullivan-Clarke and Inkpen express reservations too. For Sullivan-Clarke, these centre on reviews of the *Origin*. As she puts it, “if Darwin utilized the type of argument by analogy as claimed by the authors, then we might expect at least some of the critiques tendered by Darwin’s contemporaries to be directed at an argument by analogy based on proportion.” She proceeds to test her hypothesis against a limited sampling of reviews whose authors explicitly rejected something or other about Darwin’s analogical linking of the farm and nature, finding that—the special case of Mill aside—none unequivocally identified Darwin’s argument as one based on proportion rather than similitude. For my part, however, I struggle to see why her expectation follows from our thesis. On the contrary, if, as we contend, analogy-as-proportion argumentation was familiar in Darwin’s milieu, then we should not expect his contemporaries, sharing that familiarity, to make any more of a fuss over the form of the argument than Darwin did. The only *Origin* reader we might expect to make a fuss over the form would be a philosophical connoisseur of analogical arguments—the more so if, for one reason or another, that connoisseur wanted to praise where possible while still withholding assent overall. As Sullivan-Clarke shows, Mill fits that bill precisely.

Turning to Inkpen: he reckons that we went too far in writing that, for Darwin, “if humans are doing the selecting, then the good being served will be the human good, and the results will, for that reason, never add up to modifications that transform a variety into a new species.” What Inkpen objects to is the idea that Darwin thereby put humans and their selective-breeding efforts outside of nature. We find that idea as ludicrous as Inkpen does. Rather, our claim is that, on Darwin’s view, the limitations that humans bring to the enterprise of selective breeding is what accounts for the limitations of that enterprise. That is why, in his 1844 *Essay* (as quoted in our book on page 200, in the paragraph after the sentence in question), in conjuring a breeder capable of going further than human breeders could go, Darwin imagined a super-human being, with super-human mental powers. At the

limit, as that super-human becomes ever less humanlike, it becomes indistinguishable from a god, or maybe just God, or maybe — since, for Darwin, the art of God is Nature — Nature. Amidst all these collapsing distinctions, what is important is that the route from the breeder, capable of producing only new varieties within extant species, to Nature, capable of going further and accumulating variations to the point where what is produced are not merely new varieties but new species, passes not via unconscious selection (as per Graham Burnett) but via hyper-conscious selection.

David Depew's flagging up of the revival of resources from Aristotle in the generation before Darwin, by way of throwing light on how Darwin might have become familiar with Aristotelian proportional analogizing, seems to me wonderfully apt. In Depew's remarks here he concentrates on English philosophical writers of the 1830s. But anyone interested in the question of Darwin's debts to Aristotelian biology should seek out the expansive treatment in the opening chapter of Depew's magisterial 1995 book with Bruce Weber, *Darwinism Evolving* (Depew and Weber 1995; for discussion, see Radick 1998). Titled "Evolution and the Crisis of Neoclassical Biology," the chapter is a synthetic marvel, engagingly evoking the topics and texture of Aristotle's biological thought before arguing that, in contrast with the comprehensive rejection of Aristotle marking innovation in the physical sciences of the early modern and Enlightenment eras, innovation in the life sciences took the opposite tack, drawing direct inspiration from an Aristotle rescued from the Platonizing distortions of medieval Aristotelianism.

How pleasing to have joined the ranks of historians and philosophers inviting us to look again at the Aristotle-Darwin relationship! That said, in retrospect, our book might usefully have stressed that Darwin was a virtuoso of Reidian argument by analogy too. For an amazing and influential instance, see his paralleling of languages and species in the *Descent of Man* (Darwin 1871 vol. 1, pp. 59–62; for discussion, see Radick 2008).

References

- Darwin, Charles. 1871. *The Descent of Man, and Selection in Relation to Sex*. 2 vols. London: John Murray.
- Darwin, Charles. Letter to T. H. Huxley, 2 December [1860]. In *Correspondence of Charles Darwin* vol. 8, eds. F. Burkhardt et al. Cambridge: Cambridge University Press, p. 507.
- Depew, David J. and Weber, Bruce H. 1995. *Darwinism Evolving: Systems Dynamics and the Genealogy of Natural Selection*. Cambridge, MA: MIT Press.
- Hull, David L. 2009. “Darwin and Victorian Philosophy of Science.” In *The Cambridge Companion to Darwin*, 2nd edition, eds. Jonathan Hodge and Gregory Radick. Cambridge: Cambridge University Press, pp. 173–96.
- Levine, George. 2011. *Darwin the Writer*. Oxford: Oxford University Press.
- Inkpen, S. Andrew. 2014. “‘The Art Itself is Natural’: Darwin, Domestic Varieties and the Scientific Revolution.” *Endeavour* 38: 246–56.
- Quintilian, *Institutio Oratorio*.
- Radick, Gregory. 1998. “The *Origin* Unbound.” *Studies in History and Philosophy of Biological and Biomedical Sciences* 29C: 349-57.
- Radick, Gregory. 2008. “Race and Language in the Darwinian Tradition (and what Darwin’s Language-Species Parallels have to do with it).” *Studies in History and Philosophy of Biological and Biomedical Sciences* 39: 359–70.
- Sullivan-Clarke, Andrea. 2013. “On the Causal Efficacy of Natural Selection: A Response to Richards’ Critique of the Standard Interpretation.” *Studies in History and Philosophy of Biological and Biomedical Sciences* 44: 745–55.

Wallace, Alfred Russel. 1889. *Darwinism: An Exposition of the Theory of Natural Selection, with Some of its Applications*. Cambridge: Cambridge University Press.

Whately, Richard. 1828. *Elements of Rhetoric*. London: John Murray, 1828