

CHAPTER 18

Response to Richards

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i. Introduction

Robert J. Richards has spent most of his career tracing the connections between German Romanticism and Charles Darwin. His research has done much to change our image of the great Victorian naturalist. Where earlier scholarship tended to understand Darwin's theory in the context of natural theology and political economy, both native English traditions, Richards has demonstrated the importance of foreign ideas to the creation and reception of Darwin's treatise *On the Origin of Species*. His essay above is exemplary in this regard.

I won't presume to challenge Richard's argument. His brief is a model of logic, evidence, and style; he knows a lot more about Darwin than I do; I support his interest in directing scholarly attention to Germany; and finally, I find his thesis convincing. Historians like to stress how science doesn't live in some empyrean castle of ideal dimensions, but rather on the rough-and-tumble plain of interest and influence. If we consider Richard's essay at its most sublunary, we could take his analysis of the evolution of Darwin's ideas as a metaphor of how truth emerges from history through the careful selection of material from the marketplace of ideas. But instead of focusing on Richard's rhetoric, I'd prefer to look at Darwin's reception in the country most affected by his teachings. German disciples wrangled over the meaning of his theory from the outset, something that helps to explain why the debate shows no signs of dying down there even today.¹

ii. Final Causes in Darwin's Theory

"Darwin's Theory of Natural Selection and its Moral Purpose" begins with the classic anecdote of Thomas Henry Huxley's astonishment at the simplicity of the principle of natural selection: "How extremely stupid not to have thought of that!" Richards maintains that natural selection is neither as simple as Huxley recollected nor as mechanical as scholars described. Instead, the principle embodies a complex set of ideas that took Darwin years of work to develop into a forceful argument. Drawing on evidence from notebooks, manuscript essays, and ~~early~~ drafts of the *Origin*, Richards traces the evolution of Darwin's thinking from his early beliefs in the effects of habit and environment to his analogies of breeding and warfare to his crucial reading of Thomas Malthus's essay on population. Central to this development was a teleological conception of "the production of higher animals," which Richards takes to be "human beings with their moral sentiments."

Richards adduces three sources of evidence for Darwin's belief in progress. The first is "embryological recapitulation," a phrase that refers to the parallel between the stages of growth in an organism and the order of species in the natural world. Since both series tend toward greater differentiation and complexity, many biologists assumed them to be lawfully related. As Ernst Haeckel declared in 1866, "ontogeny recapitulates phylogeny."

The second source of evidence is Darwin's image of a "hand of nature" picking and choosing the very best individuals. Much as a wise breeder selects superior types for his crosses, nature continually scrutinizes her flocks for advantages of form and behavior. The language of Darwin's metaphor is necessarily teleological: machines can't make choices, but nature can and does, and always for the good of the species.

This observation led Darwin into a conundrum. If natural selection implies a war of all against all, how do we account for instances of altruism? The inheritance of acquired behaviors is hard to imagine in organisms that lack cultural memory, and on the biological side of things, no one has been able to show how habits turn into instincts. Instead of invoking occult powers of learning and inheritance, Darwin attributed selflessness to competition in a broader sense—competition between groups. Those that cooperated prevailed over those that didn't. As Richards points out in his third source of evidence, all this struggle had a happy outcome. Nature favored the intelligent and the just.

iii. Du Bois-Reymond's Mechanist Interpretation of Darwin's Theory

The first German scientist to accept Darwin's teachings was Emil du Bois-Reymond. Why this fact has escaped attention isn't entirely clear—it may

have something to do with the oblivion into which du Bois-Reymond has fallen, and it may have something to do with the indifference with which most physiologists greeted Darwin's theory. Whatever the case, du Bois-Reymond never hid his respect for his Victorian colleague. He first learned of the publication of the *Origin* in the fall of 1859; he read the second edition in English in the spring of 1860; he let his colleagues know that he approved of the theory later that year; and by the winter of 1861 he was teaching the theory to his students at the University of Berlin. Thereafter he worked to get Darwin an honorary degree from the University of Breslau, a knighthood of the Prussian Order of Merit, and a membership to the Berlin Academy of Sciences. He also promoted Darwin in public lectures and in formal addresses, most notably a eulogy in 1883 that sparked two days of debate in the Prussian House of Deputies. Given his authority as the "foremost naturalist of Europe," and given his talent as a spokesman for evolutionary theory, du Bois-Reymond vied with Haeckel for the title of Darwin's champion in Germany.²

The interesting thing about du Bois-Reymond's example is that he endorsed Darwin for reasons entirely at odds with the ones that Richards defends. In his youth du Bois-Reymond read Lucretius, ridiculed teleology, and swore to uphold the tenets of biological reduction. He considered Alexander von Humboldt's Romantic natural history "antediluvian both in mind and matter," just as he faulted his advisor, the biologist Johannes Müller, for dabbling in the theories of Goethe. By contrast, Darwin presented du Bois-Reymond with a vision of nature "permeated by one glorious and undeviating principle of regularity"—the principle of mechanical necessity.³

Du Bois-Reymond's commitment to mechanism ran through all his discussions of Darwin. It ~~could be~~ found in his survey of the "Findings of Contemporary Science," a popular course first offered in the winter of 1861 that highlighted energy conservation and natural selection as foundations of the natural order. Du Bois-Reymond concluded his treatment of Darwin with the praise that natural selection had eliminated "at one stroke all justification for the suspenseful agony of teleology." The same judgment informed another popular "Exposition of the Darwinian Theory" that he delivered nine times between 1877 and 1880. Du Bois-Reymond ended these presentations with a simple question: Which was more dignified of God—successive periods of creation, lumps of protoplasm invested with special powers, or a primordial cosmic nebula? The last possibility, he reminded his listeners, had the advantage of positing an entirely mechanical basis to evolution. But the most complete statement of du Bois-Reymond's views on evolution appeared in "Darwin versus Galvani," a speech that one contemporary called "the clearest defense of natural selection."⁴

Addressed to the Prussian Academy of Sciences on July 6, 1876 in celebration of its founder, "Darwin versus Galvani" drew explicit lines of continuity between the mechanical character of Leibniz's physics and the mechanical

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character of Darwin's biology. Du Bois-Reymond set the stage by recounting a classic debate over design in nature. The radical materialist Baron Holbach maintained that life arose fortuitously, in opposition to the Abbé Galiani, who dismissed Holbach's conjecture as entirely improbable. This dispute expressed the quandary of natural history in the Age of Enlightenment: either it surrendered "all occurrences to the hand of Epicurean chance" or it granted a providential order to the universe. Darwin's great service was to have supplied it with a third alternative, that "of establishing blind necessity in the place of final causes." Du Bois-Reymond judged the eminence of the achievement plain. Eradicating teleology from nature constituted "one of the greatest advances ever made in the world of thought."⁵

Other scholars agreed. The author of a history of materialism rejected final causes as antiquated:

Most of those who, in spite of modern science, feel themselves justified in holding fast to teleology, cling to the gaps in scientific knowledge, overlooking the fact that at all events the form of teleology which has existed until now, that is, the anthropomorphic, is utterly disposed of by the facts. . . . It can now, however, be no longer doubted that nature proceeds in a way which has no similarity with human purposefulness; nay, that her most essential means is such that, measured by the standard of human understanding, it can only be compared with the blindest chance. On this point we need wait for no future proof; the facts speak so plainly and in the most various provinces of nature so unanimously, that no view of things is henceforth admissible which contradicts these facts and their necessary meaning.⁶

Du Bois-Reymond equally identified the concepts of force and matter as nothing other than a "more recondite product of the irresistible tendency to personification."⁷ Such animism was disastrous for science. "Final causes in nature are incompatible with its intelligibility," he explained.

Hence, if there is any way of banishing teleology from nature, the scientist has to take it. Such a way is found in the theory of natural selection In holding fast to this theory, we may feel like a man clinging to a plank that only barely keeps him afloat. When the choice lies between a plank and going under, the advantage is decidedly on the side of the plank.⁸

His allusion to Lucretius was clear: *The Origin of Species* may have been a shipwreck, but it was better than the alternative.

For the remainder of the speech du Bois-Reymond compared the views of Leibniz and Darwin. A perfect universe had no need for final causes. Modern

perspectives looked much the same. “Take away from Leibniz’s theory of the cosmos the illusory apparatus of monadology, of pre-established harmony, and of optimism,” du Bois-Reymond remarked, “and the only solid core that remains is the mechanical conception of the world.” The implications of this outlook were clear:

How profoundly in error are they who, often in tones of scientific pharisaism, lament our blindness in trying to account for the world without final causes. . . . These people simply show that they are fundamentally ignorant of what discovery means.

True understanding was physics; as far as biology was concerned, Darwin’s theory offered the closest approximation.⁹

iv. Conclusion

Richards is right—natural selection isn’t easy to understand. What are we to make, then, of du Bois-Reymond’s immediate grasp of the concept? Did he attach a meaning to it that Darwin never intended, or was he just the first of his colleagues to perceive its significance? Does natural selection superintend a grand design, or does it simply hammer order out of chaos? Scholars debated the question in Darwin’s time, just as they do now.

Notes

1. See Georgy Levit, Kai Meister, Uwe Hoßfeld, “Alternative Evolutionary Theories: A Historical Survey,” *Journal of Bioeconomics* 10, no. 1 (February 2008): 71–96.
2. The following section draws from my book *Emil du Bois-Reymond: Neuroscience, Self, and Society in Nineteenth-Century Europe* (Cambridge, MA; London: The MIT Press, 2013).
3. Henry Thomas Buckle, *History of Civilization in England*, 3 vols. (1857; 1861; reprint, Fort Worth, TX: Davis, 1987), 3: 482. Cf. Charles Darwin, *On the Origin of Species: A Facsimile of the First Edition* (1859; reprint, Cambridge, MA; London: Harvard University Press, 1998), 243–4: “one general law . . .”
4. Emil du Bois-Reymond, “Darwin versus Galvani. Rede in der öffentlichen Sitzung der Königl. Preuss. Akademie der Wissenschaften zur Feier des Leibnizischen Jahrestages am 6. Juli 1876,” in *Reden von Emil du Bois-Reymond*, ed. Estelle du Bois-Reymond, 2nd edn., 2 vols. (Leipzig: Veit, 1912), 1: 540–66; Adolf Kronfeld, “Emil du Bois-Reymond,” *Wiener medizinische Wochenschrift* 47 (1897): 167–9, 215–19, 253–5, on 253. The following section draws from ~~the eleventh chapter of~~ my book.
5. Du Bois-Reymond, “Darwin versus Galvani,” 544–5.
6. Frederick Albert Lange, *The History of Materialism and Criticism of Its Present Importance*, trans. Ernest Chester Thomas, 3rd edn. (1866; New York: Harcourt, Brace; London: Keegan Paul, Trench, Trubner, 1925), 2, pt. 2: 33.
7. Lange, *Materialism*, 2, pt. 2, 378, quoting Emil du Bois-Reymond, *Untersuchungen über thierische Electricität*, 2 vols. (Berlin: Reimer, 1848–84), 1: xl–xli.
8. Du Bois-Reymond, “Darwin versus Galvani,” 557.
9. Du Bois-Reymond, “Darwin versus Galvani,” 559–61.

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