Studies in History and Philosophy of Biological and Biomedical Sciences 53 (2015) 53–61

Contents lists available at ScienceDirect

Studies in History and Philosophy of Biological and Biomedical Sciences

journal homepage: www.elsevier.com/locate/shpsc

The Darwinian tension: Romantic science and the causal laws of nature

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ARTICLE INFO

Article history:
Received 20 May 2012
Received in revised form
30 June 2015
Available online 7 August 2015

Keywords:
Charles Darwin
Alexander von Humboldt
John F.W. Herschel
Teleology in nature
Aesthetics of nature
Causal explanation

ABSTRACT

There have been attempts to subsume Charles Darwin's theory of evolution under either one of two distinct intellectual traditions: early Victorian natural science and its descendants in political economy (as exemplified by Herschel, Lyell, or Malthus) and the romantic approach to art and science emanating from Germany (as exemplified by Humboldt and Goethe). In this paper, it will be shown how these traditions may have jointly contributed to the design of Darwin's theory. The hypothesis is that their encounter created a particular tension in the conception of his theory which first opened up its characteristic field and mode of explanation. On the one hand, the domain of the explanandum was conceived of under a holistic and aesthetic view of nature that, in its combination with refined techniques of observation, was deeply indebted to Humboldt in particular. On the other hand, Darwin fashioned explanations for natural phenomena, so conceived, in order to identify their proper causes in a Herschelian spirit. The particular interaction between these two traditions in Darwin, it is concluded, paved the way for a transfer of the idea of causal laws to animate nature while salvaging the romantic idea of a complex, teleological and harmonious order of nature.

1. Introduction

History and philosophy of science has seen an equally impassioned and unresolved debate as to which of two distinct intellectual traditions Charles Darwin and his theory of evolution ultimately belong. One side mobilises the broad and ready-to-hand evidence that shows the commitment of Darwin's theory to the standards of modern natural science and its ideals of exact, predictive knowledge, which became canonised in early 19th century Britain by the philosophers of science John Herschel, William Whewell and John Stuart Mill,[1] and which also informed political economics of the Malthusian stripe. Against this majority view, other historians set out to demonstrate Darwin's deep sympathy for a wave of ideas crossing the Channel from Germany that emerged in critical reaction to modern science: the romantic approach to arts and science, paradigmatically embodied in the literary and scientific achievements of Johann Wolfgang Goethe and Alexander von Humboldt.

In this essay, which is intended as a historically informed endeavour in the philosophy of science, I will argue that a strict disjunction between the above interpretations of Darwin's place in the history of ideas is inappropriate, and that both traditions played a formative role in Darwin's theorising. These traditions and their specific styles of reasoning may not merely have cohabited as the proverbial Goethian two souls dwelling in one breast, nor have they been adopted by Darwin in sequential order, with the romantic being discarded in favour of the modern scientific view, nor were they a mere conjunction of a romantically informed literary style and a more traditional approach to scientific explanation. Instead, my hypothesis is that that their encounter created a particular, and productive, tension in the conception of Darwin's theory which first opened up its characteristic field and mode of explanation.

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[1] For an exposition of Darwin's relation to those philosophers, see Hull (1973, 2003) and Ruse (1975).

http://dx.doi.org/10.1016/j.shpsc.2015.07.003
1369-8486/

The argument is of a dialectic kind: romantic science, with its foundations in idealistic *Naturphilosophie* and mostly in its Humboldtian incarnation, provided Darwin with a particular *language and theory of observation*, while the Victorian science of his day delivered to him the *theoretical models* on which to base his explanation. The very synthesis of what first appears disjunct is an image of nature that bears many of the characteristics of the romantic view while being made amenable to an explanation in the terms and in the spirit of the more mechanistically inclined natural sciences of Darwin's compatriots.

I will first provide a brief outline of the competing, pro- and anti-romantic interpretations of Darwin's theory (Section 2), before moving to an account of the influence on Darwin exerted by the key figure in science to emanate from (and ultimately transcend) German romanticism: Alexander von Humboldt (Section 3). This source of influence will then be matched against the other tradition to which Darwin was indebted, the Victorian variety of modern science (Section 4). The synthesis of these influences will be the topic of the concluding Section (5).

2. Contested influences

In the last chapter of his *The Romantic Conception of Life*, titled "Darwin's Romantic Biology", Robert J. Richards (2002) seeks to put Darwin and his theory into a carefully adjusted romantic light. He argues that Darwin was not only a great admirer of Humboldt and his works—whom he portraits as one of the standard-bearers of German romanticism—but that Darwin's observations of nature were also marked by an aesthetic sensitivity that was typical for that movement. This aesthetic approach was based on a conception of nature that, too, conformed to the romantic view. More precisely, both Darwin's and the romantics' conception of nature, on Richards' reading, was that of a fundamental unity of mind and nature. By implication, nature appears as inherently purposeful and dynamic in character, where, firstly, creative force permeates all matter, animate and inanimate, and where, secondly, the development of nature is considered progressive in direction, and where, thirdly, any living being's morphology adheres to archetypal patterns. Moreover, Richards claims that Darwin believed in a genuine moral significance of nature that was at odds with the then-dominant utilitarian views. The romantic view of the world, on Richards' reading, is comprised of precisely the three elements he identified in Darwin: a specifically holistic metaphysical conception of nature, an aesthetics based on the immersion in nature, and an ascription of normative qualities to nature.

In a spirit similar to Richards' (2002) but within the framework of textual analysis, David Kohn (1996) makes an elaborate case for the central importance of two romantic metaphors in Darwin's theorising, the tension between them, and their synthesis in his *Origin of Species*: the "wedging" metaphor (1859, p. 67), with its connotations of force and upheaval, representing the sublime character of natural phenomena, and the "entangled bank" metaphor (1859, p. 489), with its connotations of peace and tranquillity, standing for the beauty of natural phenomena. It is a common romantic endeavour to juxtapose and possibly reconcile the sublime and the beautiful aspects of nature in one coherent, integrated aesthetic—and this is what Kohn sees embodied in the *Origin*.

In *The Meaning of Evolution* (1992), Richards delivers a detailed historical and more matter-of-factual account of the influence on Darwin's evolutionary theorising exerted by the transcendental morphology of Goethe and some of his contemporaries via Richard Owen, and their views of embryonic development. In fact, the latter kind of process had been the referent of the term of "evolution" before Darwin repurposed it for an application to the phenomenon of species change. This twofold meaning of the term evolution, Richards argues, is neither an instance of arbitrary terminological choices nor a matter of coincidental analogies but testifies to the development of Darwin's theory from those morphological roots (and hence, using one of the biological terms at issue here as a metaphor, a homology between them).

We can now identify two levels of romantic influence on Darwin that have been argued for: firstly, there is the claim of concrete (but sometimes implicit) references to theories and theorists belonging to the romantic tradition; secondly, a less tangible relatedness in spirit to the metaphysical, aesthetic and normative underpinnings of romantic science and its conceptions of nature is claimed, where the realness of that relation—in terms of shared reference to an identical set of ideas rather than coincidental similarities between them—is somewhat more difficult to demonstrate. These two levels of influence, although natural companions and genealogically related, are note entailed by each other. One could adopt the theories in question for circumscribed explanatory purposes without actually buying into the metaphysics and aesthetics in which they were embedded as well as one could embrace the aesthetics and some of the metaphysics of nature without caring much about the scientific pretentions that travel with them. The strongest case for a romantic influence on Darwin will be the one that confirms it on both levels.

Michael Ruse is an outspoken advocate of the received, nature-red-in-tooth-and-claw view of Darwin's theory, as becomes particularly clear from his (1999) book *The Darwinian Revolution*. In his review (2004) of Richards' above-mentioned last chapter, he would not accept either level of romantic influence. Although he does not deny that supposedly romantic thinkers, above all Humboldt, had an influence on Darwin, he locates all decisive factors in the formation and elaboration of his theory within the British tradition in which Darwin grew up. At most, the views to be found in the romantic sources are not too dissimilar from the ones he encountered closer to home, which, as Ruse claims, were the ones he actually referred to—for example the notion of homology, the above-mentioned ideas in embryology, the belief in the progressiveness of evolution, and the deistic God-as-nature rather than the traditional Christian theistic spiritual undercurrent.[2] Above all, however, Ruse argues that there is no way in which the central Darwinian tenet of natural selection could be made to fit into a thoroughly romanticised picture of Darwin. Without postulating that causal mechanism, his theory would not be an explanatory theory; with that mechanism included in the picture, there are key components in Darwin's theory that escape the romantic view, which hence is unable to capture the essence of his theory *qua* theory.

Natural selection as a mechanistically conceived causal force that gives rise to intricate design in nature is a leitmotif not only in Ruse's rendering of Darwin's theory but also in the mainstream of evolutionary thinking after Darwin, mostly in what has been

[2] In his argument against Richards, Ruse neatly divides scientific and philosophical positions along geographic and political boundaries, where romanticism is considered a specifically Germanic state of mind, and where modern science is the profession of the sober Englishman. Ghiselin (2015) adopts a similar position, with the addition of seeking a non-British key influence on Darwin in French rationalism rather than German romanticism. Such stereotyped arguments *ad patriam* might be particularly difficult to apply to the scholarly realities of Darwin's day though. German, British, French and other scientists and natural historians were aware of each others' works, not least because the fields were small enough to allow each individual to know a significant portion of what his colleagues on the other side of the Channel (or the Rhine) did and thought. Agreement and dissent between them did not neatly divide along geographical boundaries either. One does not have to look further than Humboldt to find examples of a matter-of-course scientific cosmopolitanism in the early to mid 19th Century (a phenomenon that, however, was to face much harder times in the 20th Century).