Modern Intellectual History, 8, 1 (2011), pp. 227–236 © Cambridge University Press 2011
doi:10.1017/S1479244311000138

GERMAN POST-DARWINIAN BIOLOGY REASSESSED

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Robert J. Richards, *The Tragic Sense of Life: Ernst Haeckel and the Struggle over Evolutionary Thought* (Chicago: University of Chicago Press, 2008)

Lynn K. Nyhart, *Modern Nature: The Rise of the Biological Perspective in Germany* (Chicago: University of Chicago Press, 2009)

It is hard to imagine two more engaging and thoroughly researched works on German science than the two here under review. This is especially rewarding because in the period covered—the second half of the nineteenth century and the early years of the twentieth—it is often the physical sciences that command the attention of historians. This was the time when Helmholtz was at the peak of his profession and Einstein was emerging onto the scene. Richards and Nyhart are among those historians of science who are reexamining assumptions about the sciences of life in Germany from the beginning of the nineteenth century on. In particular, as scholars of Germany they refuse to concede to any other country or individual (including Darwin) the undisputed center of attention where biological science and even the subject of evolution are concerned. Both works are much more than straightforward narrative histories. Nyhart and Richards have each taken on difficult historiographical challenges in the course of presenting the results of their research.

Nyhart's study is social/cultural history at its best. She wants to show how the construction of a modern vision of nature was affected by the emergence of modern society. In particular, she wants to show how the anxieties that accompanied increased urbanization, industrialization, and urban poverty gave rise to reforms that took place not only in the political and social realms, but also in the very conception of nature. In affinity with the desire for political and social unity there arose a new biological perspective in which the watchword for understanding nature was community. This was not a conception in which the fate of the individual, fending for himself in a blind struggle of all against all, took

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center stage. Nature's communities might well involve predators and prey, but the focus was on how members were ultimately dependent on each other and on the physical conditions of their existence. This nascent ecological outlook would grow and one day give rise to the scientific discipline of ecology, but not before it had been carefully nurtured by its creators.

Where did this new emphasis come from? Nyhart has left no stone unturned in her investigation of the sources of the biological perspective. With one notable exception she did not find these sources in traditional academe; rather, she discovered that they were to be found among men (there is passing mention of but one woman) who worked in museums, in zoos, and in the public schools. In each case it was reformers who pushed the new conception. Taxidermists and zoo enthusiasts unhappy with the status of praxis in natural history began testing the limits of new possibilities. Innovative displays of animal groups in the wild eventually worked well in museums, themselves the object of fundamental reforms in which both engaging the mass public and promoting scientific research were joined together as vital aspects of the museum's new mission. Zoo reformers portrayed living natural history as an extension of the museum, while school reformers developed a new curriculum based on the community concept. Nyhart provides an impressive treatment of each of these institutions in nineteenth-century Germany; indeed, her work is a must-read for historians who specialize in these areas. In each case there was a direct avenue of influence that led beyond the general public to various professional circles, in the end including academics.

Nyhart notes that the time and place in which the biological perspective emerged was fraught with social change that was often perceived to be out of control. She focuses on northwest Germany, the perhaps unexpected geographical locus from which much of the biological perspective became known. Nyhart feels obligated to explain why the northwest figured so prominently, even though it is less the geographic location than the rapidly changing social structure of German cities she wishes to cite as a motivating factor in the appearance of the biological perspective. Her explanation is that the overlapping of the personal and professional networks exploited by the central figures of her account happened to be strong in the north. This adventitious explanation of why the northwest was key is not convincing. She would do better simply to accept that many of the main actors in the story worked in northwest Germany and leave it at that.

As noted, it is the changing social structure that is more important to her and in this regard cities like Kiel, which plays a prominent role, was like many others in Germany at the time. In the countryside traditional dress and other symbols of the old ways were fast disappearing. In Kiel urban growth was out of control, producing dislocation among the rapidly growing population and putting pressure on infrastructure and public institutions. It is not surprising that in this context there were those who asked if there was a *natural* order of society

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from which modern society was straying. If we look to nature, what does it tell us about what is permanent and lasting? Friedrich Junge, a school director in Kiel and author of an influential book on biological communities (*The Village Pond*, 1885), explained that studying these communities was important for children because it helped them to answer basic questions: what is my place in society? Where do I fit in? Junge pointed out that communities existed on many levels, wherever the individual, through working to maintain himself, also contributed to the health of the larger unit. A household was a community, as was a city. The state was a more complex community, but it still involved the rendering of service and the dependence of the individual. Nyhart points out that in the 1880s and 1890s schoolteachers wanted especially to cultivate a sense of patriotism and Germanness in students because Germany was a new nation. Not only so, but the new German Empire was being threatened by socialism and it was important to teachers to counter antistate activities. What is involved here, Nyhart notes, is the question of German identity in the aftermath of unification.

When Germans asked such questions they tended not to get the answer made famous by Herbert Spencer in England. Nature's lesson was not that only the fit survive, that we let things be and refrain from assisting the weak. But that does not mean that *all* Germans writing about nature during the last half of the nineteenth century came to see it as community. Writing in the latter decades of the century, for example, the extremely popular scientific materialist Ludwig Büchner rejected the idea that we should regard humans as part of nature. True, he was thinking primarily about evolution, a subject avoided when possible in the latter half of the nineteenth century by many of Nyhart's Germans. Büchner conceded that humans had evolved from more primitive forms, but in his mind the farther we distance ourselves from nature and acknowledge that we are *not* like animals, the more authentically human we become. He was in effect saying that humans must take responsibility for the future direction of evolution, not for the sake of nature, but for that of humans. Nature was still the Other, alien and foreign to humans and definitely not a conception that joined humans and animals together. This attitude represents an alternative to the biological perspective Nyhart depicts as emerging during the same years.

Nyhart does not deal much with religion, leaving the reader with questions about how exactly we are to understand its place in the minds of the creators of the biological perspective. She is clear that the emphasis on community could be seen to reinforce a conservative political approach to understanding the responsibilities of citizenship. In answer to the query, "Who am I in all the diversity I see in nature?", she quotes Junge to reply, "You are a link in the whole, you receive and give, you are dependent and have an effect" (178). That indeed could be understood to mean that we are all part of a natural system in which we are called on to play our part without trying to upset the natural balance. But how do we

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then differentiate humankind's place in the grand scheme from the message being touted by Ernst Haeckel, who proposed in 1877 that evolution be substituted for religious instruction in the schools? Junge's own school superintendent opposed his book, *The Village Pond*, because he believed it could lead to pantheism and atheism. Haeckel's public promotion of his evolutionary world view led in 1882 to the banning of biology from the secondary-school curriculum in Prussia. We can clearly see why the founders of the biological perspective chose publicly not to associate with Haeckel or his monistic view, but did they privately embrace it? We suspect so.

For his part, Richards has taken on a different and difficult challenge. Picking up from where he left off in his magisterial *Romantic Conception of Life* (2002), Richards wants to explore how the emotional inner biography of an individual helps us understand his significance. If Richards wanted to suggest merely that knowing something of Haeckel's inner biography helps us understand *him*, we could easily agree. But he wants more. He wants to assert that knowing the inner biography helps us better understand not only Haeckel, but also to some extent his work.

Richards has set out in this volume to reconsider the place of Haeckel in the history of science and in the history of Western culture. One of his goals is to raise Haeckel's scientific stature in the annals of science from that of an unorthodox Darwinian to a sophisticated defender of Darwin's theory, to replace Haeckel's image as a mere popularizer with that of a scientific and even artistic genius. Since 2005 three other works have addressed the glaring lack of biographical material on Haeckel: Mario Di Gregorio's *From Here to Eternity: Ernst Haeckel and Scientific Faith* (2005), Bernhard Kleeberg's *Theophysis: Ernst Haeckels Philosophie des Naturganzen* (2005), and Olaf Breidbach's *Visions of Nature: The Art and Science of Ernst Haeckel* (2006). In addition, Sander Gliboff's recent book on German evolutionary thought, *H.G. Bronn, Ernst Haeckel, and the Origins of German Darwinism* (2008), also reevaluates Haeckel's scientific achievements, including his understanding of evolution. Unlike these other works, Richards's is a psychological study of Haeckel and his work.

I have referred to Richards's "psychological method" because what is important to him is Haeckel's inner life. This is not psychoanalytic history in the vogue of Erik Erikson's *Young Man Luther* (1958) or Frank Manuel's *Portrait of Isaac Newton* (1968). Richards wishes to become so knowledgeable about the details of Haeckel's life that he acquires an intimate personal acquaintance with him. This, he hopes, will enable him to give an account of Haeckel's life and work on more than one level. He will draw on the extensive repository of knowledge he has acquired to provide rational explanations of Haeckel's achievements and activities based on the usual kind of evidence we demand of historical scholarship. There is much of that in this work. But Richards's immersion in Haeckel's life also provides a

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foundation on which Richards bases personal judgments about the emotional motivations that undeniably played a part in decisions that made Haeckel who he was.

Is such a goal feasible? If not it is not because Richards has failed to do his homework. No one has examined the historical record more thoroughly than he has, on the level of both primary and secondary sources. But can one become so familiar with the life of a historical figure that he can claim to know what makes that person tick? Can an appeal to one's understanding of another's emotional makeup possess explanatory power? That decision will have to be made by each reader, but in the end the decision will, at least in part, involve nonrational criteria similar to those Richards uses when giving us his judgment about Haeckel's inner life.

Richards is confident that his efforts to get to know Haeckel have allowed him to glean new insights. The common depiction of Haeckel as a mere popularizer, for example, misses the mark, according to Richards, because it fails to appreciate both the quality of his scientific work and the import of his representation of science. Richards takes us carefully through Haeckel's scientific work to show us exactly how first-rate it was. For example, in just the first few years of his career he did pioneering work on protists, identifying them as a separate kingdom; he discovered and described myriads of marine species that continue to be associated with his name; he named and practiced the new science of ecology; and he was the first to argue systematically that metazoans come from single-celled creatures by aggregation and then the division of labor.

But Richards in no way wants to undervalue the impact Haeckel had through his popular writings; indeed, according to Richards, it is to Haeckel that we are indebted for the joining of materialistic metaphysics with evolution. He informs us that before World War I more people learned about evolutionary theory through Haeckel's works than through any other source. Since Haeckel's materialistic and monistic version of evolution, which was perceived as nontheistic and even atheistic, became highly visible in the late nineteenth century, Richards is willing to conclude that this unrequired, or, in his word, nonessential, association between evolution and irreligion may well not have been made had Haeckel not lived. In popular culture Darwin has become the symbol of science against religion. Richards suggests that that role is more appropriately Haeckel's.

This is an interesting claim because, as Richards points out, the representation of evolution, especially in the twentieth century, has been that it entails atheism, or at least that linking it to a religious view is inappropriate. As the century wore on the association spread beyond evolution to all science: science itself was more and more seen to be atheistic. Successes in theoretical physics, especially with respect to attempts to unify nature's fundamental forces, buttressed the idea that there

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was no intrinsic purpose evident in the universe, that the more we learn about it the more it seems that it is not governed, as physicist Steven Weinberg would have it, by any principle in which morality or human life or love or justice play any special role. And physicists themselves have credited Darwin's idea of natural selection as the real source of this conclusion. Leonard Susskind credits Darwin and Wallace with really beginning modern cosmology because they were the first to provide explanations of our existence that completely rejected supernatural agents. But in Richards's view, and that of many other historians and evolutionary scientists, the conclusion need not be drawn that Darwinian evolution entails an atheistic view. Tacking atheism onto neo-Darwinian evolution is in the end not required by the theory.

But make no mistake here. Richards does think that there are aspects of science that *are* essential. He rejects the claim of some social historians that what we think of as *defining* features of evolutionary science (or any science) are not necessary features, but historically contingent trappings. For Richards, had Darwin not lived someone else would have come up with descent with modification and natural selection. These were not arbitrary or replaceable concepts. But he does not feel, as do so many neo-Darwinians today, that embracing the theory of evolution by natural selection means that one cannot embrace a religious view of the world. There are plenty of examples among modern evolutionists of thinkers who call themselves both Darwinian evolutionists and theists. Why, then, do they appear to be in the minority? Where did the widespread impression that being a Darwinian evolutionist means you are also an atheist come from? For Richards it is the polarizing impact of Ernst Haeckel. "Had Haeckel not lived, evolutionary theory would have turned a less strident face to the general public" (15).

Richards brings his usual thoroughness and exquisite prose to his depiction of Haeckel's life. His interpretation of the man turns on his seeing him as a Romantic, of course in the German sense. This is both the good news and the bad news. Richards is without question one of the country's leading authorities on German Romanticism, especially as it manifested itself among natural philosophers of the first half of the century. He has the tools by which to examine the degree to which Haeckel was subject to the influence of German Romantic thought. By the same token, we must acknowledge that his claim to have found resonances of German Romanticism in Charles Darwin (by way of Alexander von Humboldt) have been criticized by those who find the notion unacceptable, even preposterous. But even these critics might not balk at Haeckel as a Romantic since many of them do not regard him as a genuine Darwinian to start with.

Not surprisingly, it is far easier to show the romantic roots of Haeckel's outlook than Darwin's. Not only did Humboldt provide inspiration, so also did Johann von Goethe, whom, according to Richards, Haeckel always had by his side. It was Goethe's scientific or poetic works he quoted at the beginning of every one of the

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thirty chapters of the *General Morphology* (1866). And it was Goethe whom he credited as the source of his monism, the world view on which much of Haeckel's fame rests. But of course it is not merely that he read and quoted these authors. It is more that he saw nature as they did, a unity that linked together every aspect of reality so completely that this unity itself could replace the God of his youth.

And so Haeckel's outlook is not pure materialism—monism joins matter and mind together into a fundamental unity the earlier German Romantics called the Absolute. Schelling was not alone in cherishing the works of Spinoza, for whom the unity of mind and matter was captured in his concept of substance. For Haeckel a universe that was devoid of purpose was impossible. He could not be content that all the purpose that exists comes from us humans. The riddle of the universe in part is that the cosmos is a meaningful place. We can surrender ourselves to it and rest content that we are part of a larger drama, though certainly not one directed by a transcendent Creator. The source of creation is not transcendent, but immanent, the *Deus sive natura* of Spinoza. Haeckel drew on the Romantic premise, originally derived from Kant's thought, that we catch glimpses of the sublime in aesthetic judgments. Monism, he said, was the purest kind of monotheism.

And yet Haeckel's denunciation of formal religion, with its personal God, was so vicious that he was widely denounced as an atheist. He could not abide the intolerance of dogma, the refusal to be open to the possibility of new truth. Richards chronicles his struggles not only against religious fanatics, but also against many others who wanted to discredit him. Richards believes that early in his career the rapturously emotional love he shared with Anna, first as his fiancée and then as his wife, staved off the pull of materialism that came from his study of science. When she died on his thirtieth birthday after less than two years of blissful marriage, Haeckel came close to suicide himself. With nothing to restrain him, he abandoned all hesitation to leave behind the conventional, as he later said, dualistic understanding of reality and embraced the Romantic pantheism that would motivate and sustain him from then on under the name of monism. In a biographical note written a decade after the tragedy in Jena, Haeckel confirmed that the death of his wife "destroyed with one blow all the remains of my earlier dualistic worldview" (Richards, 107).

Of course Richards would not contend that Haeckel's inner convictions are the sole reason he turned to monism. As already indicated, his preparation for this move ran deep into his intellectual past. But Richards is clear that Haeckel's mature intellect, including the specific scientific ideas he created, cannot be explained simply by referring to those whose works he had read. "The strategy of causally linking the theories of a scientist not only to the ideas supplied by predecessors and contemporaries but also to the deeper forces of the self is born of

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a historiographic conviction" (9). He cites the Spanish novelist, poet, playwright, and philosopher Miguel de Unamuno, who in 1913 lamented that most histories of philosophy presented various systems of thought as if they grew out of one another spontaneously. The philosophers themselves were mere pretexts. "The inner biography of the philosophers, of the men who philosophized," continues Unamuno, "occupies a secondary place. And yet it is precisely this inner biography that explains for us most things" (Richards, 10).

For Richards, as for Unamuno, the explanatory force of inner biography completes and subsumes the causal efficacy of logic. His defense of this historiographic conviction is eloquent:

> Ideas that are logically or semantically fit to be cause and effect of one another must yet be brought into proximity and charged with causal energy through hopes and fears, desires and sufferings. Without the infusions of personality, ideas floating through the mind of a scientist will remain limp and anemic, poor effete creatures that evanesce away. (10)

Given the tragic trajectory of Haeckel's life, he was a subject ripe for Richards to attempt to make his case.

How, specifically, does Richards argue that Haeckel's inner biography helps us understand not merely Haeckel the man, but also his work? To make this claim he first assumes that the metaphysical trappings that accompanied Haeckel's science are not extraneous to Haeckel's science. Although no specific metaphysical belief is required by Darwinian science, monism does help to define *Haeckel's* work in science. The trajectory of his life in science was profoundly affected by the loss of Anna. Although Richards does not say so in so many words, I have no doubt that he would agree that, had Anna lived, Haeckel's place in the history of science would be quite different from the distorted one that has been depicted in the past and even from the corrected one presented in Richards's book. Because Anna died Haeckel surrendered himself to research in materialistic science; indeed, he lost himself in it in part to deaden the pain of his enormous loss. But although he now had reason to accept that nature is governed by principles in which morality or human life or love or justice play no special role, he still could not deny his romantic self. Richards puts it eloquently in a revealing passage:

> The metaphysics that underlay Haeckel's biology was well-suited to the science of the late nineteenth century and, I think, to that of our own time. It also allowed Haeckel to believe that the force of a once-living soul might be brought back into the beating heart of nature, since the conservation laws indicated that neither force nor matter could be destroyed. Anna would not die forever. (128)

Let me suggest that both of the authors under review here have something in common beyond their devotion to the history of German biological science in the nineteenth century. What I have in mind is their wish to address themes

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much larger than the ostensible subjects of their studies. In Nyhart's case the theme is implicit, not one she explicitly acknowledges as even present, let alone intended. That is the depiction, to borrow Erazim Kohak's term, of a moral sense of nature. There is something "right" about the biological perspective in the minds of those who promulgated it. Perhaps this is because for these Germans the emerging modern understanding of nature always included humans—they were not excluded as they were in the early American ecological movement. Community in nature, then, carried a message for *us*, and that message had to do with our place in the grand scheme of things. If a historian's choice of subject matter reveals something about the historian herself, if it is true that a historian cannot spend an extended amount of time with her subject, in Nyhart's case over a decade, without some measure of identification, then we suspect she will not be unhappy that I read her book to have raised this larger, to be sure, controversial issue.

Richards is quite explicit about the big picture with which his study of Haeckel has become entangled. While the very title gives away that Haeckel's life is being portrayed as tragic, Richards wants us to see this as indicative of much more than the plight of one man. Near the end of his book Richards again cites Miguel de Unamuno's *The Tragic Sense of Life*, whose author spoke of "the tragic history of human thought" itself. Our tragedy lies in our inability to resolve the struggle between "reason bent on rationalizing life and forcing it to submit to the inevitable, to mortality," on the one hand, and "life bent on vitalizing reason and forcing it to serve as a support for its own vital desires" on the other (453). Our longing for immortality and union with the eternal divine cannot conquer the skepticism of reason, but neither can science quash our wish for a morally meaningful universe. Neither can vanquish the other, so we are caught forever, tragically trying in vain to resolve the irresolvable contradiction. His powerful utilization of Unamuno's sentiment makes it clear that Richards himself endorses it.

One bonus Richards gives us is a thoughtful appendix in which he assesses "The Moral Grammar of Narratives in the History of Biology." Here he concludes that a historian's narrative must make moral assessments, "not only in respect of the times in which the subject of the history operated but in respect of the historian's own standards." His ultimate purpose here is first to examine the subject thoroughly in general terms so that he can reasonably evaluate the ways Haeckel has been morally judged over the years, both with respect to individual episodes from his life (e.g. the alleged fraudulent manipulation of images to support his recapitulation theory) and to more general questions about his status as a scientist and as a proto-Nazi. Here Richards's training in philosophy contributes constructively to his analysis, producing an essay well worth reading on its own.

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The appendix treats the question of moral judgment of historical figures in a general sense. With regard to the specific condemnation of Haeckel as a proto-Nazi, Richards vehemently rejects the characterization, passed along by numerous scholars, of Haeckel as an anti-Semite whose racist ideas paved the way for fascism. He concedes that Haeckel, Darwin, and most other nineteenth-century scientists were racist in their depiction of human races in an ascending hierarchy. But he notes with satisfaction that Haeckel placed Semites at the pinnacle of his tree of human progress and that Nazi functionaries relatively quickly rejected an early attempt to claim Haeckel as a hero. Richards cites Haeckel's positive valuation of Jews as important elements of German culture (from a discussion Haeckel held in the 1890s with an Austrian novelist on the phenomenon of anti-Semitism), and discredits evidence used by those who have tried to use Haeckel's alleged membership in the right-wing Bavarian Thule Society (later instrumental in the rise of the Nazi German Workers' Party). There was an Ernst Häckel who belonged, but he was a painter and not the professor from Jena.

There are many particulars in both books that I have not discussed, particulars that show the depth of the authors' research and their command of the subject matter. From the grand issues I have touched on, however, it should be clear that I regard both authors to have succeeded admirably in giving us wonderfully informative and provocative works that will long stand the test of time.

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