

A Premodern Synthesis

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On 5 November 1836, 23-year-old biologist, writer, and revolutionary Georg Büchner presented a lecture to the philosophical faculty at the University of Zürich entitled “On Cranial Nerves.” In it he introduced a distinction between the teleological conception of nature and one that he called “philosophical.” The former, which he claimed was most prominent in England and France, considered the purpose (*telos*) of organs to be their *raison d’être*; the latter, which he held was characteristic of German thought, interpreted existing organic forms as manifestations of an underlying generative principle, or *Urgesetz*. Büchner argued that the philosophical conception of nature, whenever it managed to escape the dogmatism of a priori philosophizing, had led the way to such impressive advances as Goethe’s theory of metamorphosis, Lorenz Oken’s vertebral theory of the skull, and the idea of the archetype (1).

Unfortunately, Büchner died shortly after delivering this lecture and before he could present his own fully developed natural philosophy. Though his short life blossomed at the end of the “Age of Goethe” and the beginning of the new age of industrialism with its mechanical conception of life, it is unclear how Büchner would have conceptualized organic phenomena. Not only is this an intriguing question, it is also one that would require us to integrate Büchner’s creativity, scientific as well as artistic (his plays, especially the fragmentary *Woyzeck*, have been called the “first modernist plays”), within the larger context of his times. Such an undertaking is by no means easy.

Robert J. Richards’s *The Romantic Conception of Life*, however, makes this task a little less difficult. It serves as an excellent model that demonstrates how historical understanding of scientific developments is greatly aided by closely integrating cultural history and biography with an analytical account of the history of science. With this volume, Richards, the director of the University of Chicago’s Fishbein

Center for the History of Science and a professed Romantic, accomplishes what anthropologist Clifford Geertz refers to as “thick description.” Weaving a tight web from the interacting threads of historical, philosophical, political, erotic, personal, and scientific developments and relationships, he brings alive the era of Goethe and Romantic *Naturphilosophie*.

Historians of biology always had problems with *Naturphilosophie*. Undoubtedly its era was an important one; indeed the very concept of “biology” was a product of this period. But the time was also one during which people seemed to blend experimentation with speculation, science with philosophy, and nature with art in such ways that make it difficult to clearly identify what was sound science and what was speculative excess. Such a conclusion, however,

reveals more about the fundamental assumptions of the commentators—namely that it is possible to distinguish between “true” scientific progress and historically contingent “distractions”—than about the actual history. For example, even Timothy Lenoir, whose *The Strategy of Life* has to date been the main analysis of this period in English, tries (in a way) to bypass the complications of *Naturphilosophie* (2). He argues that the major figures of the period, such as Johann Christian Reil, Carl Friedrich Kielmeyer, Karl Friedrich

Burdach, and Karl Ernst von Baer, were actually teleo-mechanists (Lenoir’s term) who based their conception of nature on Kant’s notion of teleology *als ob*. (Teleology “as if,” which implies a heuristic rather than an ontological notion of teleology.) Kant, of course, is considered to offer a far more respectable philosophical basis than many of the *Naturphilosophen*.

Here Richards takes an altogether novel route. Rather than separating science from philosophy, art, and personal elective affinities, he traces the myriad connections among all these aspects of life in the Age of Goethe. And he does so in a historiographically sophisticated manner, clearly and inclusively defining Romantic biology as a subset of *Naturphilosophie* and simultaneously giving life to these concepts by connecting them with the rich personal and professional lives of the major figures of the period. Richards’s account illustrates just how tightly science was woven into the life and loves of his protagonists. He discusses the early Romantic movement in Jena, the Icarus-like career of the young philosopher Friedrich Wilhelm Joseph Schelling, and especially the multitalented titan Goethe. Escaping court life, unrequited love, and Weimar for the lush shores of Italy, Goethe combined science, poetry, and eroticism in just one line of his Roman elegies: “I have softly beat out the measure of hexameters, fingering along her spine.” The eternal female, the vertebral theory of the skull, and the idea of the archetype all held together by poetry. What a life, and what a science!

One of the central scientific concepts of this period was the idea of the archetype as the foundation of morphology, an idea that today is primarily known through Richard Owen’s canonization of the vertebrate archetype. Owen’s ideal archetype is generally considered in opposition to Darwin’s theory of evolution, which has turned the archetype

into an ancestor and has subsequently (through the Modern Synthesis) dispelled the idea altogether. Richards paints an altogether different picture of the role of the archetype in Romantic biology, a role that is a far cry from the dry representation of a small number of (ideal) bones. Rather, for Goethe and his fellow German Romantics the archetype represented the generative principle of nature, a principle that could simultaneously account for the enormous rich-

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by Robert J. Richards

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A Romantic view of nature. Caspar David Friedrich’s *Man and Woman Contemplating the Moon* (c. 1824).

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One divided or two as one? Goethe dedicated his poem *Ginkgo biloba* to Marianne von Willemer and sent her a copy on which he pasted ginkgo leaves (7).

ness of forms and the underlying similarities—one, that expresses, in the true sense of the word, the *poiesis* of nature. For an entire generation of extremely talented Romantic scientists, who studied the archetype in all its transformations and metamorphoses, it was thus the principle that unites the poet with the scientist and both of them with nature.

It is interesting to see how the idea of the archetype is currently making something of a comeback. The new version is far less poetic, to be sure, yet is given a similar explanatory mandate. A “genetic toolkit of development” explains how the diversity of forms is generated with a small set of regulatory genes; “key innovations” and “deep homologies” enable adaptive radiations of groups; and the search is on for the shared genetic characteristics of all “Urbilateria” (3). The idea of generative principles of form, whether they are referred to as an archetype or not, has thus proven to be a rather productive idea in science.

Richards’s most heretical claim in the book is that Charles Darwin, an epitome of solid Victorianism, was not immune to the

virus of German Romanticism and indeed was himself, at the very least, a closet Romantic. Although this conclusion is sure to draw a lot of fire, it also has a striking appeal. How else can we explain that after pouring decades of labor into the development of his theory, Darwin concluded that “there is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one.” And that the final words in *On the Origin of Species* are “from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved” (4). But it is not only psychology or literary analysis that supports Richards’s conclusion. Thanks to Janet Browne’s recent two-volume biography (5, 6) and Darwin’s own writings, we know how much he was influenced by Alexander von Humboldt, friend of Goethe and the Jena Romantics. And we can also see how the more dynamic notion of the archetype that was at the heart of Romantic biology

already preconfigured the conceptual space for Darwin’s theory of transformation. Such a view of Darwin should also have some appeal to modern biologists who attempt to integrate development into evolutionary biology and who search for the mechanistic and genetic basis of the transformations of forms. They, too, have been blessed by the master.

In *The Romantic Conception of Life* Richards eloquently illuminates a period in the history of biology where science and art were not yet separated. And, if he is correct about the lasting influences of these thinkers, his work suggests that “nature need not be deprived of her soul of loveliness” even today.

References and Notes

1. G. Büchner, *Sämtliche Werke, Briefe und Dokumente* (Deutscher Klassiker Verlag, Frankfurt am Main, 1999).
2. T. Lenoir, *The Strategy of Life. Teleology and Mechanics in Nineteenth-Century German Biology* (Univ. of Chicago Press, Chicago, 1989).
3. See, for instance, S. Carroll, J. K. Grenier, S. D. Weatherbee, *From DNA to Diversity: Molecular Genetics and the Evolution of Animal Design* (Blackwell, Malden, MA, 2001).
4. C. Darwin, *On the Origin of Species: A Facsimile of the First Edition* (Harvard Univ. Press, Cambridge, MA, 1964).
5. J. Browne, *Charles Darwin: Voyaging* (Pimlico, London, 1995).
6. J. Browne, *Charles Darwin: The Power of Place* (Knopf, New York, 2002).
7. A translation of Goethe’s poem is available at www.xs4all.nl/~kwanten/name.htm.

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