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EDITOR'S CORNER

Why Darwin?

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Why are we all still so transfixed with Charles Darwin? Why do we—scientists and laymen alike, people who embrace evolution as well as those who reject it—still speak of "Darwinism" as if evolution is synonymous with the work of this one single Englishman—a man who was born on February 12, 1809 (as was Abraham Lincoln) and who died in 1882? After all, Darwin was certainly not the first person to suggest that all life on earth has descended from a common ancestor living in the remote geological past. Moreover, Darwin had died years before Mendel's work establishing genetics had been rediscovered, and of course, long before the molecular revolution that has unraveled the structure and function of the components of DNA and RNA, took place. Physicists encounter Newton as a seminal, even revolutionary, figure in the history of their subject—but though they may refer to "Newtonian Laws," they stop short of calling their subject matter "Newtonism."

Darwin may not have discovered evolution—but he was the first person to cast the subject in a thoroughly scientific mode: Darwin in effect said that the pattern of nested resemblances that link up all organisms, the very pattern that underlies the Linnaean system codified a century before Darwin wrote *On the Origin of Species* (1859), arises as a necessary consequence of "descent with modification." Homology; the resemblances among the embryos of "allied" species; the Linnaean system; the sequence in the fossil record of the simplest prokaryotes coming first, followed by single-celled eukaryotes and then, later, metazoans and metaphytes—all arise as predicted observations if evolution has in fact occurred.

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But, that said, the variegated array of scientists who study evolution—especially the processes of evolution—realize that there is still much to be learned about the evolutionary process. And they disagree, often passionately, on what a complete theory of evolution (should it ever be achieved!) would look like. Some, whose focus arises mostly from the molecular revolution, argue that the core of the evolutionary process lies in the competition among genes for representation in the next generation; Dawkins' (1976) notion of the "selfish gene" is perhaps the best known form of this argument. Others (like myself—e.g., Eldredge 2008) prefer a richer tapestry—where the structure of ecosystems, and the physical events that perturb those ecosystems, determines the context in which genetic variation is winnowed by natural selection. But all of the disparate parties in modern evolutionary biology trace their own "intellectual lineage" back to Darwin—thus we are all still "Darwinians."

The main reason why Darwin's name is still so closely tied both with the field of evolutionary biology that he founded, and in society at large, with the very notion of "evolution," is simply that Western culture (not to mention the rest of the world!) has yet to fully absorb, digest—*metabolize*—the very idea of evolution. For Darwin saw that, if evolution has happened, it must have included our very own origins as well. And in doing such a magnificent job in establishing the scientific legitimacy of evolution in his *Origin*, he also threw the gauntlet down on the traditional, religiously imbued story of who we humans are and how we came to be here in the first place. And, of course, Darwin was keenly aware of the trouble he was to cause when he eventually found the courage to publish his evolutionary ideas. When, in 1844, he began to confide in relatives and some close professional colleagues that perhaps species were not "immutable" after all, he

acknowledged his anxiety especially clearly when he wrote to the botanist Joseph Hooker that it is "like confessing a murder" (Darwin 1844).

So we still speak of Darwin simply because we have yet to have fully absorbed his message. In the first decade of the twenty-first century, some of the Victorian intellectual giants are beginning to fade from our conscious minds—important, even crucial, as their work has been to western thought. Marx, for example, has dimmed as communist states increasingly adopt the free market ethos and praxis of the west (though perhaps such countries will entertain second thoughts given the spectacular failures of the free market in recent times). Freud has (unwisely, I also think) begun to give way to Prozac. And Charles Dickens has disappeared from the British £10 note—replaced, by, of all people, Charles Darwin, a few years ago. Darwin stands virtually alone amongst his contemporaries as a man whose name still resonates in modern times.

So we still pay attention to this man. Most of us, when we think of Darwin, see him as a wise (if sometimes rather sad) old man nearing the end of his life. I have spent much of the past 5 years focused especially on Darwin, first in preparation for a major exhibition on Darwin that opened at the American Museum of Natural History in New York in late 2005 (an exhibition which is now travelling the world as Darwin's 200th birthday approaches in 2009).

But Darwin piqued my curiosity—as I have long felt that Darwin is the very model of the creative scientist. He left well over 10,000,000 words behind him—most of them still unpublished: books, letters, scientific notes, even shopping lists. This rich store of Darwiniana gives us an unrivalled look at the very workings of the mind of the man whose ideas still roil the world. And I—along with a host of Darwin scholars—have continued to sift through this vast storehouse of information.

Instead of seeing Darwin as an old man, I have been most intrigued in the past few years with the young Darwin—the young man with only rudimentary training and only the simplest of scientific equipment, who travelled on the H.M.S. *Beagle* for nearly 5 years (1831–1836) around the world. What did Darwin do, observe, collect—especially in South America—that led him, a fairly conventional-seeming (if economically well-off) young man who was imbued with the traditional story of Creation, to embrace the notion of "transmutation"?

Darwin's passion for his work—and, more deeply, for *life* itself—shines brightly throughout his diary, letters, and notes on the *Beagle*. And though Darwin never lost this passion, even as he battled periods of depression (like Lincoln, Darwin seems to have been a "melancholic") throughout the remainder of his life, the joy he took in nature, and in his work coming to grips with nature, is never more evident than when he was on the *Beagle*.

Most famous, of course, is his written cry "The mind is a chaos of delight" as he recorded his thoughts and feelings when at last he glimpsed a true tropical rainforest—in Bahia, soon after the *Beagle* reached Brazil in 1832. The Bahian forest was the prototype for his "entangled bank" passage in the last, reverentially poetic paragraph in *On the Origin of Species* published 27 years later.

And, excited as he was to experience first hand the wonders of South American ecosystems, its species of animals and plants, its fossils—in Darwin's head there lurked a quieter, careful, analytic mind. I am now convinced that Darwin framed his observations in those early years in South America (1832–1835) before he reached the Galapagos (later in 1835) as if he were testing transmutation even then. His excitement about seeing the fossil bones of an agouti (his "cavy"), very similar, he felt, to the modern Patagonian species, still early in 1832, reveals Darwin's keen interest in species native to South America—species replacing one another in space and in time.

I have reached the conclusion that Darwin was testing the idea of transmutation from his earliest experiences in South America (see my essay "Experimenting with Transmutation. Darwin, the *Beagle*, and Evolution" elsewhere in this issue). He had learned of these ideas from his mentor Robert Grant (and quite possibly others) during a 2-year sojourn in Edinburgh as a medical student. He had been bored with the lectures, sickened at the sight of blood, and horrified at the screams of patients in the operating theater—and so chose instead to remain outdoors, hunting and collecting and learning the rudiments of marine zoological research from Grant, an avowed Lamarckian and an admirer, as well, of Darwin's very own grandfather Erasmus, who had also written of transmutation in positive terms. Here, in this young naturalist aboard the *Beagle*, we have the quintessence of the passionate, yet deliberately analytic young man, who later in life confessed he had been eager to take his place among the men of science when once he finally returned home to his native soil.

As much as we may still wrangle over the intellectual heritage that *is* the very idea of evolution (arguing, that is, not *whether* life has evolved, but exactly *how* it has evolved), the opportunity to observe Darwin as a young man literally transforming himself from a creationist to a transmutationist while in South America is not only a thrilling adventure in its own right: for it is also an astonishing insight into how the very best, creative science is actually done. As in all walks of life, human creativity is the interplay between the mind and an object. In music, the "object" is the rather abstract realm of possibilities of melodies, harmonies, and rhythms thrown up (in western music) by the 12-tone scale and the examples of previous composers. In natural science, the mind resonates with the rather more obvious and concrete patterns of nature

herself—together with what previous observers have already said about those patterns.

Darwin shows us how the process of doing science—milestone science, with a conclusion that we have yet fully to metabolize culturally—is a fundamentally human endeavor. I stand in awe of the man and his work—as I say, most especially when he was an untutored, inexperienced young man on his epic voyage in South America.

So why Darwin? Darwin is all of us, as we seek to do our creative best no matter what our path in life—and above all in maintaining our very passion for life itself.

References

Darwin C. 1844. Letter to Hooker. January 11. Letter 729. Cambridge University Library Archive. http://www.darwinproject.ac.uk/darwinletters/calendar/entry-729.html.

Darwin C. On the origin of species by means of natural selection. John Murray: London; 1859.

Dawkins R. The selfish gene. Oxford University Press: Oxford; 1976.

Eldredge N. Hierarchies and the sloshing bucket: toward the unification of evolutionary biology. Evolution: Education and Outreach 2008;1:10–5. doi:10.1007/s12052-007-0007-6. http://www.springerlink.com/content/541881k3h8218453/?p=2b7a464cd7cb4bb5a0d77c530a1fdc3a&pi=2.