

Introduction

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*T*his special issue on Charles Darwin and evolutionary theories comes after popular attacks on, or challenges to, modern evolutionary theory and after the 2009 celebration of the 200th anniversary of Darwin's birth and the 150th anniversary of the publication of *On the Origin of Species*. Both the challenges and the celebration have recognized the cultural and scientific importance of Darwin and his theories. One can only hope that the good scholarly and critical work done on Darwin and his work will help the general public to develop clearer and more sophisticated understanding of the science and its significance.

It is ironic that Darwin, the modest and socially timid man who shunned the spotlight during his lifetime, has become the public face of evolutionary theory and the focus of its controversies – an intellectual hero or a villain – when in fact the introduction and development of evolutionary theory has been, from its beginning, a work of many hands and minds, calling upon and addressing many disciplines and influencing even more. Darwin was an extraordinary thinker – a synthesizing mind, a patient, careful, and painfully accurate researcher who could reach out to many sources around the world – and a superb rhetorician who spent much of his professional life formulating and reformulating his support for his theories of natural selection and sexual selection. His description of his writing in *The Origin* as “one long argument”¹ is an appropriate characterization for all of his published writings on evolution. Yet many others, critics and supporters, decisively influenced the development of those theories.²

Some of the essays in this collection examine Darwin's contributions to the science of evolutionary theories and his brilliance as a rhetor-

rician. Others, however, examine writers who challenge aspects of Darwin's theories or offer alternative theories of transmutation. Still others describe how popular writings on related scientific and literary topics prepared readers for Darwin's great books or were shaped by them. Historically, it is important and interesting to learn about these writers. But these essays also shed further light on Darwin, whose concerns as a writer were pragmatic. He wrote with a real awareness of the audiences he hoped to persuade and so knowledge of the social, political and intellectual contexts is crucial for understanding his challenges and his achievements.

Furthermore, the eventual success of modern Darwinian theory has, almost inevitably, colored, and sometimes skewed, the histories of earlier controversies. One of the best examples is the now famous T.H. Huxley-Samuel Wilberforce debate about evolution at Oxford University in June 1860. William Irvine's dramatic rendering of the event leads readers to believe that Huxley, arguing for Darwinian theory, decisively defeated Bishop Wilberforce, arguing against. Huxley, he wrote, "committed forensic murder with a wonderful artistic simplicity, grinding orthodoxy between the facts and the supreme Victorian value of truth-telling his victory over the Bishop was one of light over darkness."³ His description does not mention that opinion as to who had won the debate was ambiguous at best⁴ or that shortly thereafter the Bishop, no buffoon, published a 17,000 word critique of the *Origin* in the *Quarterly Review*, which challenged Darwin by raising the vexing problem of human origins.⁵ The "victory" for science and evolution became clearer only after the murky recollections of the event were artificially selected. Certainly the debate settled nothing at the time. Understanding and appreciating the strength of alternatives to Darwinian theory is important not only to students of cultural history, but also to those nowadays who wonder why so many people, especially in the United States, remain unconvinced or hostile to scientific explanations of human evolution.

Rosemary Lloyd's "Georges Cuvier and the Power of Rhetoric" describes the style and attitude as well as the anti-evolutionary ideas of one

of the most important scientific figures in the nineteenth century. Cuvier (1769-1832) founded vertebrate paleontology and was famous for his ability to reconstruct a skeleton from a single bone. His debate in 1830 with his colleague Étienne Geoffroy Saint-Hilaire concerned the fixity of species. Geoffroy Saint-Hilaire believed that species gradually and slowly evolved from their original form, a theory, widely held in the nineteenth century, that is associated primarily with Jean Baptiste Lamarck. Cuvier argued that species do not change and that the gaps in the fossil record show the extinction of species from catastrophic changes on earth and new creations of species thereafter. Two of the most formidable opponents of Darwin's theory, Richard Owen and Louis Agassiz, developed Cuvier's ideas. The gaps in the fossil record, that is the absence of intermediate forms as evidence of gradual transformation, remained one of Darwin's biggest problems, and the recent explanation by Stephen Jay Gould and Niles Eldredge, called "punctuated equilibrium," revives, in a modified form, Cuvier's belief in saltationism, that is, brief (in geological time) periods of intense change followed by long periods of relative stasis.⁶

Lloyd's description of Cuvier's rhetoric and style provides a fascinating comparison with Darwin's writing, and the different cultural situations of the two men. Cuvier writes with the sense of authority and assurance that his social class and professional standing provide. He has the assurance to make generalizations based upon a single example (a striking similarity to his reconstruction of a skeleton from a single bone) and to offer first person reactions which make him the central figure in the scientific adventure. Since his theories support rather than challenge the fixity of species, in an important way he is a conservative. His writings seem to have influenced conservative idealists at Oxford who opposed materialist assumptions and conclusions about human evolution. There is a clear reference to Cuvier in a notebook Oscar Wilde kept at Oxford in the 1870s while he was preparing an essay on the importance of Mind (or Spirit) in the writing of history:

As the anatomist can from a single bone create the whole structure of those marvelous animals now extinct, or as the Botanist from a single plant can infer the general character of the Flora of a district, so to a mind truly endowed with the historic sense the most significant fact is often [of] the highest importance[.] Facts are the oil by which the historic muse feeds her lamp: but the light is given by ideas: Facts are the labyrinth: ideas the guiding thread[.]⁷

Cuvier makes the kind of arguments only established theorists can: challengers must prove their case. If they cannot, the established theory stands. Cuvier argues that since the fossil record shows no evidence of slow transformation, his position on the fixity of species holds. Clearly he is also unconcerned with the religious or social reactions to his ideas. He assumes his reader will accept and enjoy the experience of discovery that his science offers. Darwin, equally adept as a rhetorician, seems a polar opposite. He supplies many examples to support his theories, acknowledges problems and weaknesses in his argument, grants those who oppose him respect, and is very aware that his audience may be hostile or threatened by his positions. He was clearly an intellectual – if not a social – outsider, and he planned his writing with those facts in mind. Indeed he went so far as to avoid discussing human evolution in the *Origin* for fear he would offend and lose his audience.

Cuvier's other important accomplishment, Lloyd writes, was his creation of a new system of classification, a taxonomy of all living species. He divided the living world into four branches: vertebrates, mollusks, articulates, and radiates. The taxonomist's task was to find and define the archetype or ideal type of each species and so reveal a structure common to its branch. That is to say the project of taxonomy adopted the Aristotelian and Christian assumptions of a fixed nature and species as part of an eternal, if not divine, order.

Thomas Henry Huxley, not yet "Darwin's Bulldog," took advantage of his position as ship's surgeon on the *Rattlesnake* to research and write

a series of papers on the taxonomy (structure and characteristics) of the Medusa, a radiate jellyfish. He hoped the papers would establish his professional reputation and win him a rare academic position, which in those days was an act of aristocratic patronage. While the appointment and its financial security eluded him, his work gained him some respect and visibility.

George Eliot and her partner, George Henry Lewes, also struggling financially, knew and were deeply interested in Huxley's and other scientists' taxonomic work. There was a demand for popular works of natural history, especially those that the expanding reading public could investigate locally. Eliot and Lewes decided to try their hands at such a study, *Sea-Side Studies at Ilfracombe* (1858), a combination of tourist guide and science lesson. Lila Marz Harper's essay, "Re-examining Taxonomy and Gender: T.H. Huxley, G.H. Lewes and George Eliot View the Medusa," describes the development of a small but representative crisis occurring among taxonomists. New specimens and careful study of early and simple forms of life challenged basic definitions and distinctions from established taxonomies like Cuvier's, which worked well for vertebrate animals. Categories defining species, such as sexual differences and identity as either individual or communal, broke down as new research appeared and prepared the public for new evolutionary ideas. Harper ends her essay discussing the influence of these ideas on Eliot and other writers of the period.

Two essays discuss Darwin as a writer bent upon persuading his readers. James Wynn's "A New Species of Argument: The Role of Mathematics in Charles Darwin's *Origin of Species*" focuses on Darwin's use of mathematics to support the crucial principles for his theories of species creation by natural selection in chapters 2 and 4 of the *Origin*. Wynn describes Darwin's intellectual background, his knowledge of the mathematical work of previous biogeographers (i.e., those who study the geographic distribution of organisms), and his use of data from statistical and arithmetical analysis to support two claims, that larger species and genera produce greater variations than smaller ones, and that there is a

principle of divergence of character in nature that helps to explain how small differences among closely related species and varieties grow into larger differences. Natural processes, Darwin argued, favor the selection of variety over similarity.

Wynn argues that rhetoricians have not recognized the importance of Darwin's use of quantitative data and mathematical calculations because he often did not include this material in the *Origin*. Other evidence, from Darwin's correspondence and notebooks, confirm that the data from such calculations played an important part in his thinking. The *Origin*, he explains, was not meant to be Darwin's big book on natural selection, but rather a quickly written abstract necessitated by Alfred Russel Wallace's unexpected paper explaining his theory of species transformation by natural selection. The essay is an important reminder to literary scholars that the primary sources of Darwin's persuasive power were and are his appeals to evidence, logic, and reason.

Nevertheless, Darwin was quite aware of the need to appeal to his readers' feelings and values as well as their reason. Indeed, Richard Owen, the famous zoologist who argued against Darwin, claimed in an article in the *Edinburgh Review* in 1860 that Darwin's "charming" and "pleasing style" and a "certain artistic disposition" had the result that "several, and perhaps the majority, of our younger naturalists have been seduced into the acceptance" of his theory (quoted in Lewontin). While this is a left-handed compliment at best, it does recognize that Darwin was not above plucking a heart-string or wrapping his radical or unpleasant ideas with pleasing emotional associations. Mary Noble's essay, "Darwin Among the Novelists: Narrative Strategy and *The Expression of the Emotions in Man and Animals*," looks carefully at how Darwin uses examples from fiction to support his controversial contention that humans and animals share physiological behaviors that signal similar states of consciousness. She also explores Darwin's own strategies of presentation and his thoughts on the origins of the pleasure we feel from literary descriptions of pain.

As Ernst Mayr noted, "no Darwinian idea was less acceptable to the Victorians than the derivation of man from a primitive ancestor.... The primate origin of man ... immediately raised questions about the origin of mind and consciousness that are controversial to this day."⁸ Even Alfred Russel Wallace, the co-formulator of the theory of natural selection did not believe that the human mind had developed by that process. Darwin himself, at the end of *The Descent of Man*, acknowledges the difficulty of explaining "[man's] god-like intellect," his ethical and moral values, and the appreciation of beauty evolving as the direct result of natural selection.⁹ In *The Expression* his argument was with Sir Charles Bell, whose book, *Essays on the Anatomy and Philosophy of Expression*, takes this natural theological position. The mind is part of the body but the Creator is the source of our "higher intellectual faculties.... He has laid the foundations of emotions that point to Him, affections by which we are drawn to Him, and which rest in Him as their object."¹⁰ Darwin's working assumption was that a state of consciousness was revealed by a physical action. It is hard to find evidence of this link, but certainly novels, which Darwin and his wife read in great numbers, provided many examples that joined physical and emotional descriptions. Noble's careful analysis of Darwin's mini-narratives, his choices, editing, and comments show that he took great care to infuse and domesticate his controversial materialist analysis of consciousness and its origins with respectable, pleasurable, and reassuring associations. Her conclusions are consistent with Jonathan Smith's analysis of Darwin's use of visual images in *The Expression*.¹¹ One comes away from this essay with new admiration for Darwin the rhetorician and a new awareness of how important he felt it was to disarm the fears voiced, mainly but not entirely, in the popular press, that acceptance of his theories would inevitably encourage immorality and political radicalism.

During the Victorian period John Ruskin was one of the most influential voices who feared the radical social effects of Darwin's materialist analysis of human consciousness, and thus he attacked it in several of his works. Sara Atwood's "The Soul of the Eye: Ruskin, Darwin, and the Na-

ture of Vision” finds that Ruskin’s strong resistance came from his belief in the moral and spiritual significance of sight. Like William Blake, whom he admired, Ruskin believed the materialist vision of science was a flawed but powerful and potentially destructive force in society. Where Darwin famously compared the eye to a telescope, Ruskin described sight as a spiritual organ, “intellectual lens and moral retina.”

Atwood reminds us that Darwin found it difficult to believe that an organ as intricate and perfect as the human eye could be formed by natural selection since it would not provide a selective advantage until it reached a high degree of development. Nevertheless, reason drove him to make and explain that claim. Atwood identifies several works and passages in which Ruskin defines spiritual seeing, its importance for human development, and its difference from Darwin’s materialist analyses. She identifies the roots of Ruskin’s beliefs in Greek myths, Platonic philosophy, in the Bible and Christian symbolism, and in his colleague F. Max Muller’s description of the evolution of language. His search for meaning in the etymology of a word or origin of a myth, an interest he shared with Muller, is strikingly similar to the taxonomist’s search for the archetypal form of a species. Indeed, many writers, including Muller, rejected Darwinian explanations of humanity’s animal origins because humans had a unique consciousness which could create and use language. All of them were idealists opposing Darwin’s strictly materialist analysis.

While Darwin’s theories were opposed by many idealists and believers in a special spiritual nature of humanity, some radical materialists on the political left wrote that his interpretation of evolution, as well as those of Herbert Spencer and Huxley, were tainted by bourgeois ideology and supported capitalist economic practices. In his conclusion to *Descent*, Darwin does remark that competition, i.e., the struggle for existence, needed to continue in society (Darwin, *Descent*, 919). Jessica Kuskey’s essay, “Bodily Beauty, Socialist Evolution, and William Morris’s *News From Nowhere*,” examines the challenges to Darwinian theory from some writers on the left, especially those socialists from the

Social Democratic Federation. Morris was part of, and supported the group and its journals, *Justice and Commonweal* (where he published *News From Nowhere*). She discusses Friedrich Engels' "Socialism: Utopian and Scientific" because it influenced the scientific discussions in the journals. Engels argues that a scientific socialism must be based on an historical materialist dialectical analysis of nature and society. A number of socialist writers reconciled their belief in evolution and socialism by arguing either that the theory of evolution did not require the struggle for existence to go on forever or that human beings, because of their intelligence, could exert control over nature.

Peter Kropotkin, the Russian radical anarchist and scientist, was also a member of Morris's circle. He contributed to the development of evolutionary theory, indeed all science, from below with his critique of Huxley and Spencer's overreliance on the Malthusian element in Darwin's work. Kropotkin points out that Darwin acknowledged the existence of natural checks to population (thus easing the necessity of Malthusian scarcity) and he argued that social cooperation as well as competition existed at all levels in nature. Other writers, not as well known now, contributed serious and satirical criticisms of capitalist evolutionary theories. All socialist writers believed that the next stage of social evolution would be cooperative rather than competitive.

Kuskey provides this concise history of socialist evolutionary thought to contextualize Morris's utopian novel, particularly to better understand his utopist's comments on science, heredity and beauty. She makes a strong case that the beautiful citizens of utopia are not the result of a forced eugenics policy. Instead, Morris fictionalizes the socialist belief that with the end of capitalism and its exploitative aspects of marriage, a natural and healthy love, however transient, would result in the enhancement of bodily beauty.

As Kuskey points out, not all socialists agreed in their interpretations of evolution. And a number of radicals, including Alfred Russel Wallace, did not alter their explanation of evolution to explain or justify their political views.

Indeed, all these essays show us something of the complexity and variety in the history of evolutionary theories. Intellectual and social histories have not played fair with some of these people. Both Herbert Spencer and Alfred Wallace have deserved more attention than they've had – Spencer, because of his enormous popularity and influence at the time (now destroyed, as T.H. Huxley might have said, by a nasty little fact); Wallace, because of his major contributions to the explanation of species transformation. But history also plays tricks with its favorites. Who, after all, would imagine that Charles Darwin would be buried in Westminster Abbey? The Muse, like Darwin himself, is an ironist.

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Notes

¹ Charles Darwin, *On the Origin of Species: A Facsimile of the First Edition*, ed. Ernst Mayr (Harvard UP, 1991), 459.

² For a brief but lucid description of the history of evolutionary thought see Richard C. Lewontin, "Why Darwin?" *The New York Review of Books* Vol. 56, No. 9 (28 May 2009). On line. Lewontin's essay opposes a great man theory of evolution and emphasizes the contributions of writers before, during, and after Darwin.

³ William Irvine, *Apes, Angels, & Victorians* (New York: McGraw-Hill, 1955), 7.

⁴ Adrian Desmond and James Moore, *Darwin: The Life of a Tormented Evolutionist* (New York: Warner Books, 1991), 497. Stephen J. Gould has written a thorough analysis of the errors in the conventional account of the debate. See "Knight Takes Bishop?" *Bully for Brontosaurus* (New York: W.W. Norton, 1991), 385-401. The play *Inherit the Wind* about the famous Scopes trial suggests Clarence Darrow's triumph over William Jennings Bryan was a victory of science and truth over ignorant fundamentalism, but ultimately evolutionary theory was not taught in the schools and the Butler law, which forbade it in Tennessee, was not rescinded.

⁵ Ronald W. Clark, *The Survival of Charles Darwin: A Biography of a Man and an Idea* (New York: Random House, 1984), 145.

⁶ Niles Eldredge and Stephen J. Gould, "Punctuated equilibria: an alternative to phyletic gradualism," in T.J.M. Schopf, ed., *Models in Paleobiology* (San Francisco: Freeman Cooper, 1972), 82-115. Reprinted in N. Eldredge, *Time frames* (Princeton UP, 1985).

⁷ *Oscar Wilde's Oxford Notebooks: A Portrait of Mind in the Making*, ed. Philip E. Smith II and Michael S. Helfand (Oxford UP, 1989), 169. Wilde was deeply influenced by a number of philosophers, Oxford Hegelians, and other intellectuals, like John Ruskin and F. Max Muller who, while not hostile to the findings of science, rejected the philosophical materialism that guided scientific interpretation. See "The Context of the Text" in the *Notebooks*.

⁸ Ernst Mayr, *One Long Argument: Charles Darwin and the Genesis of Modern Evolutionary Thought* (Harvard UP, 1991), 25.

⁹ Charles Darwin, *The Descent of Man and Selection in Relation to Sex* (New York: Modern Library, n.d.), 919-20.

¹⁰ Sir Charles Bell, *Essays on the Anatomy and Philosophy of Expression*, 3rd ed. (London: Murray, 1844), 82-83.

¹¹ Jonathan Smith, "Darwin's faces I," *Charles Darwin and Victorian Visual Culture* (Cambridge UP, 2006), 179-213.

