

The Secret History of Victorian Evolution

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I have a confession to make. For the past three years I have been Director of the Darwin Correspondence Project, and have spent much of this time (and certainly most of 2009) making Darwin better known. It is a part of my job. But among my colleagues, this puts me in an odd situation, for my name and reputation are built on a book, *Victorian Sensation*, showing that Darwin was less important than we actually thought. When we discuss the history of eighteenth and nineteenth century evolution, we do not have to talk primarily about Darwin. So that is how I came up with the title of this lecture: 'the Secret History of Victorian Evolution'. What I want to do is to go behind the scenes of Victorian evolution and to give a better picture of what was going on, putting us closer to the position of those people who tackled *On the Origin of Species* when it was published on 24 November 1859.



DARWIN200

Figure 1

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First, though, I want to point to a widespread, but problematic image (Figure 1) that will be familiar to everyone at this moment. This is the logo chosen by the Natural History Museum for the national celebrations of 'Darwin 200'. Just about everything it symbolizes is problematic. Above all, Darwin is here a black-boxed silhouette, an old man with a beard. The most telling aspect of this image is the lightning bolt is coming down through Darwin's head. This would make a suitable advertisement for a headache remedy; but it is a very poor guide to how we need think about Darwin. Because Darwin was not black-boxed; we know remarkable amount about what were inside that head and one thing we know for sure is that there was not a sudden lightning bolt or inspiration that led him to come up with the theory of evolution by natural selection. Even more important, the image suggests, falsely, that science is the work of a singular genius, rather than the result of decades of hard work and debates. Thus what I want to do is to help us think in other ways about Darwin and his book.

Today, then, we will not focus on an individual person such as Darwin or even the other founders of evolution, but on readers. What happened when the readers first opened up *On the Origin of Species* and began to read? As what kind of thing did hundreds and thousands, and now millions of people, evaluate the *Origin*? It is those people whose reaction made the difference. In November 1859, they were not only the readers of the *Origin*; they were readers of many other things too. They were dealing with a subject which had a history. Therefore my aim is to trace a reading history of evolution before Darwin.

To do this we need first to go back into the eighteenth century. There are two figures that are well known within the story. One is Erasmus Darwin, Charles Darwin's grandfather, who wrote a very well-known poem, *The Botanic Garden*, as well as other works on evolution and zoological philosophy. In late eighteenth century England, these were incredibly popular and sold very well. In *The Times* newspaper in 1820s and 1830s, the word 'Darwinize' meant 'to think like Erasmus Darwin' and particularly to believe the great chain of living beings gradually arose through spontaneous generation. Another key figure is Jean-Baptiste Lamarck, one of the great generation of French naturalists around the time of the French Revolution. Lamarck also wrote a book, *Philosophie zoologique* (1809) that discussed the progressive history of evolution and related it to broad environmental circumstances. It thus becomes part of an Enlightenment story of universal progress. This notion was extensively discussed, especially in France. The debates in England were not so widely spread as in France, and for good reasons, not least because evolutionary ideas became associated with godless atheism and revolution.

Both Erasmus Darwin and Lamarck came up with a theory of spontaneous generation of monads. According this theory, over time new organisms continually come into being. There is a scale of beings in which human is on the top and simple microscopic organisms at the bottom. This is a single chain: the ones down the bottom are simply those which have to evolve the most. For Lamarck, species do not die away, and there is no extinction: one species just evolves to the next species higher up in the line. Evolution (or transmutation, as it was generally called) works like an escalator. The point of view of Erasmus Darwin appeared around the time of the late Enlightenment. This theory therefore was neither shocking nor horrible; it was widely discussed and debated among polite society, at dinner parties and soirées, for conversation among the elite. The book's publisher was reputable, the edition was handsome.

This situation changed dramatically in the decades around the 1800. The underlying reason for that is surprisingly simple: the revolution in France, particularly in its violent phase during the 1790s. This transformed not only political life in Britain, but religion and politics too. It is important to understand the depth of the resulting fear, which extended right through the first half of the nineteenth century. We need to understand why readers who were positive about the idea of evolution in the Enlightenment, who enjoyed Erasmus Darwin, now found these ideas dangerous and shocking.

Take a contemporary satirical print, ‘Death or Liberty! Or *Britannia & the Virtues of the Constitution* in danger of *Violation* from the gr[e]at Political *Libertine, Radical Reform!* Underneath the cloak of reform are immorality, murder, starvation, blasphemy, and a fire-breathing demon waving aloft Tom Paine’s notorious *Age of Reason*. There isn’t a copy of Lamarck or Erasmus Darwin here, but there could well be. These were the sort of works—evolutionary works—now associated with dangerous materialism. These were no longer seen as books to further light conversation, but had become quite terrifying. Britannia, fortunately, wields the sword of the laws and is on the rock of religion, with the British lion coming to the rescue. This image is highly polemical, coming at the peak of Revolutionary paranoia; but it represents attitudes that persisted in Britain right through the middle of nineteenth century. In order to understand the fate of the ideas with which evolution was associated, we need to understand the depth of that reaction.

As a result of these developments, thinking, talking about and working with a subject such as the development of one species out of another became difficult to do throughout the 1830s and 1840s. It was why, for example, the young Charles Darwin wrote—half jokingly—to the up-and-coming young botanist Joseph Hooker, that his work on evolutionary transmutation was like confessing a murder. Darwin was afraid because that evolution was effectively outside of science, but also because it was often seen as irreligious and potentially dangerous. He contemplated the most difficult aspects of the subject, dealing with religion, morals and materialism, in special notebooks marked ‘private’. These thoughts were for himself alone, dealing as they did with subjects that could no longer be discussed in polite company.

How did this change? Our traditional picture is summed up by the image with which I began, of Charles Darwin and the lightning bolt of his great idea. From this perspective, Darwin is the person who not only revived the theories of Lamarck and others; he put a new twist through the innovation of natural selection. Darwin thus made evolution effectively safe for science as practiced in the nineteenth century. There are some elements of truth to that story, but (I am afraid) not many.

What we have to do is to get beyond the distorting perspective of the bicentennial celebrations, to view the issue from the perspective of the decades before the *Origin* in 1859. In order to understand this, we need especially to look at *Vestiges of the Natural History of Creation*, about which most of you will have never heard. It was published by a prestigious medical publisher in London, John Churchill. It appeared in 1844, fifteen years before the *Origin*. There are many interesting features to notice about this book and the huge controversy it engendered. Perhaps the most intriguing is one of the reasons why I called this talk ‘The Secret History of Victorian Evolution’. Whereas the title page of Darwin’s book indicates Fellow of the Royal, Geological, Linnean, etc., Societies’, *Vestiges* was anonymous, and appeared to be written by nobody (Figure 2).

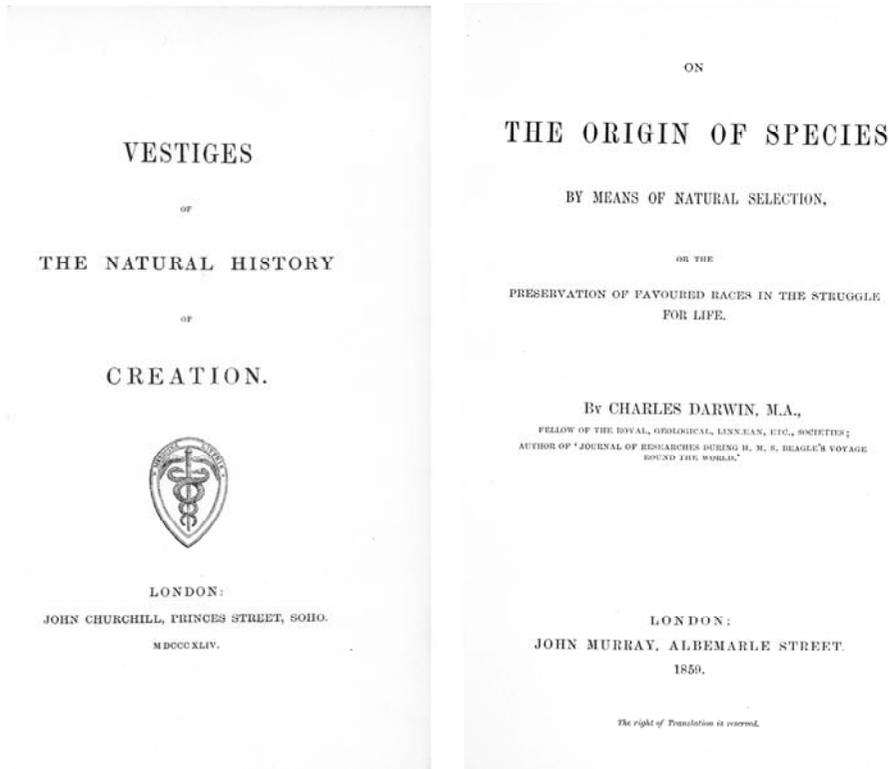


Figure 2

I spent a lot of time, fifteen years, studying *Vestiges*, so you might expect me to say it is important. Yet if we were to ask almost any Victorian reader in 1859, ‘what is the big book on evolution?’ they would also have said: ‘*Vestiges*’. In fact Darwin—albeit reluctantly—would have agreed. This was the one book on the species origins that he assumed all his readers would be familiar; he refers to it in the *Origin* without introduction or explanation. It is not too much to say that *Vestiges* laid the foundations of how the problem of evolution was tackled in the English-speaking world of the nineteenth century.

So, what does this curious book with a strange title say? Drawing on the latest findings of contemporary science, *Vestiges* takes all the indications of progress in nature, and combines them together. The book starts off with evidence for progress in the heavens, as observed by the great telescope of Lord Rosse in Ireland. As the astronomer John Pringle Nichol wrote in his *Views of the Architecture of the Heavens* (1837), ‘In the vast Heavens. . . all things are in a state of change and PROGRESS; there too—on the sky—in splendid hieroglyphics the truth is inscribed, that the grandest forms of present Being are only GERMS swelling and bursting with a life to come!’¹ The

¹ J. P. Nichol, *Views of the Architecture of the Heavens* (Edinburgh: William Tait, 1837), pp. 206-7.

material universe is nothing but one face of a mighty progress. *Vestiges* then turned to the history of the earth. Geologists had uncovered a series of lost worlds during the early decades of the nineteenth century, as in the famous lithographed print, *Duria antiquior*, which depicted various animals all attacking to one another. Such an image was one of many illustrating the succession of life on earth: fish, amphibians, reptiles, mammals. Finally *Vestiges* turns to the evolution of the human mind. The brains of different animals made a series, from the simplest vertebrates to humans (Figure 3).

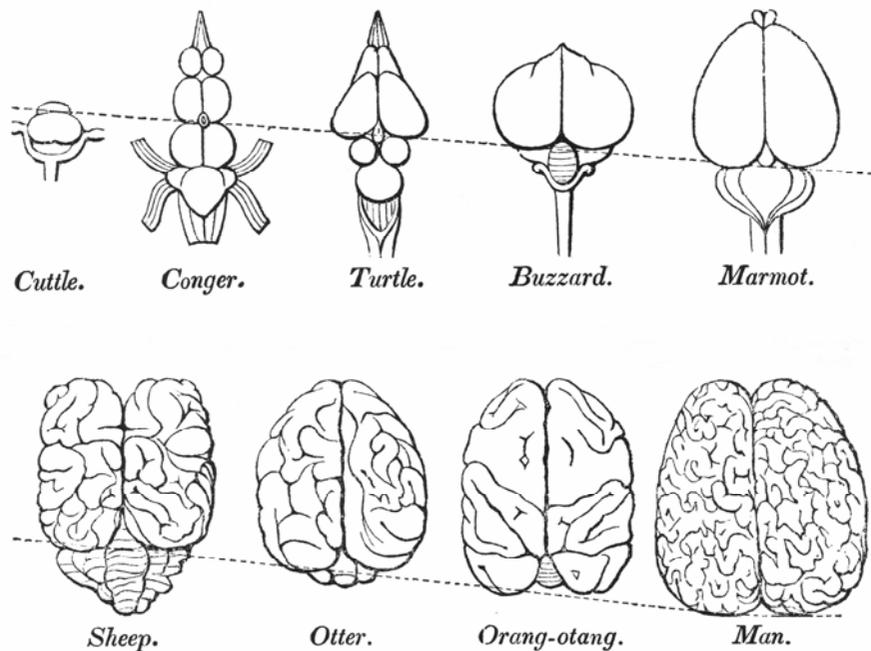


Figure 3

In their original sources, these different stages formed series, but had no connection in causal terms. They were not mutually related through Lamarck's or Erasmus Darwin's process of evolution. But in putting them together, we can see a progress that starts off with blazing nebula, gradual condensation, to the formation of the earth, the formation of strata, the formation of each one of the higher groups, the formation of man—and in the end the successor to humans, some form of angel. A universal progress underlies the development. As the anonymous author said, understanding this process is as easy as understanding how a woman comes to a full term of pregnancy. It is the 'universal gestation of nature'.²

² [R. Chambers], *Explanations, A Sequel* (London: John Churchill, 1845), p. 172.

The developmental cosmology in *Vestiges* was potentially (though only potentially) dangerous to religion. The anonymous author was very clear in stressing that the evolutionary process had a divine direction. God worked through law: this was *Vestiges*' message. A whole chapter was devoted to arguing that once we understand that this developmental law came about through the superintending will of God, creation could be at once material and at once divine. There was no separation between these things. Darwin later adopted much the same strategy, pointing out that it did not make sense for God to intervene at every stage, to meddle with tiny differences between species; it must be much grander for each new development came about through this process of law.

There are many ways we can think about *Vestiges*. I have just indicated how the book combined the new sciences of the nineteenth century using notions of developmental progress and universal history derived from the Enlightenment. Or we can see the book as an intervention in the long running and often difficult debates about the relationship of science to reason and the French Revolution. Yet another way to think about *Vestiges* is in terms of its secret author, Robert Chambers. Chambers was one of the co-founders of one of the leading publishing companies of the nineteenth century, which issued numerous textbooks, a popular weekly journal of fiction and essays, as well as a celebrated encyclopaedia. Chambers was a very active person within the useful knowledge movement of the early nineteenth century, known for his breadth of knowledge and interest in many subjects, including science, though he was not generally recognized as a practicing man of science.

Not surprisingly, Chambers was anxious to protect his family and his business reputation. He thus kept himself very much to himself; *Vestiges* remained instead an anonymous work. Therefore I think an approach in terms of the author's intentions and background—though traditional in much intellectual history—does not make sense. More to the point, anonymity meant that the author's identity became a key talking point. Figure 4 shows a cartoon (from *Punch* that appeared three years after the book came out. We can see *Vestiges* sitting at the entrance to a foundling hospital with a little sign, 'Wants a Father', on his hat. The accompanying text suggests a whole range of potential authors, some plausible, many ridiculous. The motley assemblage of people suggested as the *Vestiges* author indicates the range of people in Britain thinking at this time about broad questions of species or origins. Among them, occasionally, was the name of Charles Darwin. For many, however, this was unlikely, for various mistakes in the early editions of the book suggested that the author was an outsider to the specialist circles of early Victorian science. Errors were removed in print, rather than before the book appeared.



Figure 4

In the end, though, focusing on the anonymous author is just the wrong way to go; we need to think first of all about readers.

When we recast the history of evolution in the nineteenth century around readers, we can see the difference that books like *Vestiges*, which are usually dealt with as incidentally in histories of evolution, actually made. In modern terms, it was a bestseller, although this term is anachronistic, as it involves a relationship between readers and the commercial market that does not apply to this period. For a work of this kind, it certainly sold very well. It was reviewed by dozens of journals and newspapers in Britain, reprinted very widely in United States, and translated into German, Dutch, and Italian. It was discussed at dinner parties; and unlike Lamarck or Erasmus Darwin, it could be discussed in mixed company. After nearly fifty years of either being damned or ignored in polite society, the forbidden subject come out of the closet. Take, for example, a contemporary description of a scientific conversation in the 1830s—which could only turn to Lamarckian transformism after the ladies had left, and the gentlemen lit up their cigars. In contrast, in many circles people could talk about *Vestiges* when the ladies were still there. A much broader and more public debate could begin.

Vestiges was one of the big sensations. The word ‘sensation’ means: first, a public event involving a large number of people react to something all at once; and second, an immediate physiological impact, in this case on readers. Readers used the book in many different ways; some were horrified by it, some loved it, and some found it a new gospel to live by. Hardly anyone was neutral. Unlike most other scientific books of the period, it read like a novel. It tells a story, starting off with the formation of the universe and ending with the higher destiny of humanity. A compelling narrative led readers to feel that they could not put it down.

One of the best known readers was the Rev. Adam Sedgwick, from the University of Cambridge, who wrote anonymously about the book in the prestigious quarterly *Edinburgh Review*. He was absolutely furious about what he found. Although now convinced that the author was male, he had suspected a woman, and worried that the book would undermine the special place of women in society. ‘It is our maxim’, Sedgwick wrote,

that things must keep their proper places if they are to work together for any good. If our glorious maidens and matrons may not soil the fingers with the dirty knife of the anatomist, neither may they poison the springs of joyous thought and modest feeling, by listening to the seductions of this author; who comes before them with a bright, polished, and many-coloured surface, and the serpent coils of a false philosophy, and asks them again to stretch out their hands and pluck forbidden fruit—to talk familiarly with him of things which cannot be so much as named without raising a blush upon a modest cheek; —who tells them—that their bible is a fable when it teaches them that they were made in the image of God—that they are the children of apes and the breeders of monsters—that he has annulled all distinction between physical and moral . . . —and that all the phenomena of the universe, dead and living, are to be put before the mind in a new jargon, and as the progression and development of a rank, unbending, and degrading materialism.³

From this point of view, the talk in *Vestiges* about God and God's laws was superficial, a sugar coating around a pill of deadly poison. The book labeled itself as the medicine we need, but in fact it would destroy society. The book was a prostitute, Sedgwick warned in his private letters: tear off the pretty clothes, and the body below was corrupt and foul. His violent rhetoric recalled one of the leading evangelical critics of the book, Samuel Bosanquet:

We readily attribute to it all the graces of the accomplished harlot. Her song is like the siren for its melody and attractive sweetness; she is clothed in scarlet, and every kind of fancy work of dress and ornament; her step is grace, and lightness and life; her laughter light, her very motion musical. But she is a foul and filthy thing, whose touch is taint; whose breath is contamination; whose look, and words, and thoughts, will turn the spring of purity to a pest, of truth to lies, of life to death, of love to loathing. Such is philosophy without the maiden gem of truth and singleness of purpose; divorced from the sacred and ennobling rule and discipline of faith. Without this, philosophy is a wanton and deformed adultress.⁴

This book was hated, despite the fact that the author represented it, if not as entirely orthodox, as compatible with the idea of existence of God. Why others should not read it this way was very difficult for the author to understand. In his private letters, Chambers could never comprehend why

³ [A. Sedgwick, ‘Natural History of Creation’, *Edinburgh Review* 82 (July 1845): 1-85, at p. 3.

⁴ S. Bosanquet, *‘Vestiges of the Natural History of Creation’: Its Argument Examined and Exposed*, 2d ed. (London: John Hatchard and Son, 1845).

his book met such opposition. But what we need to stress is not the negative nature of the response of the reviews by Sedgwick and Bosanquet, but the bulk of the reaction, which was actually surprisingly positive. Especially in early reviews for the general public and in the leading literary weeklies, this cosmology was considered as a major contribution. Readers were tired of isolated facts, and wanted science to say something about the larger story of nature and the way nature works. They might not agree with the way that the laws of development and the doctrines of religion were related, but they could imagine that this could be worked out in some form, even if not in the way that the author told us.

There are many examples of such responses. One telling instance is a Methodist school teacher, a governess to a group of children at Carlisle. Mary Smith recalled obtaining the book surreptitiously from her employer, after she found it left on a table, and ran up to her garret room to read it. Only when the dawn came and she heard the birds singing, did she reach the last page. What did she make of the book, deemed so dangerous by many that she might have been expected to follow? She was devout, wrote religious poetry and aimed to teach the truths of Christianity to young children. Deeply concerned about materialism and role of God in the world, she was 'intensely anxious' to read the book, which had 'most excited the wonder and curiosity of the reading world':

Calvinism was a sober truth with millions of people up till then. There were many of all dominations, who live daily in fear of hell; and scepticism of the archfiend's personal power was then considered equal in its wickedness to the doubt of a Deity and a future state. Judge then the alarm and head-shaking this book was received with in the religious world. Many of them read it clandestinely, and then silently waited for the comments and criticisms of the press and pulpit.⁵

For Mary Smith, *Vestiges* offered the possibility of linking religion and science in a new way. A belief in the origin of humanity through natural causes could be combined with her own evangelical faith. She brought these together in thinking and writing about the book, both in her poems and in her autobiography. An evolutionary cosmology was difficult to grapple with, but had the potential to move the world forward. She certainly had no time for dismissive comments of the kind in Sedgwick's *Edinburgh* review.

This was true for many people. Many readers thought that the book was amateurish, with flaws in fact and argument because the author was not a working man of science. Several critics mocked *Vestiges* for drawing on the much-disputed experiments of the country gentleman Andrew Crosse, which appeared to show that cheese mites could be spontaneously generated through electricity. In fact these experiments were, surprisingly, taken quite seriously within some contemporary scientific literature. For many people, though, there were too many marginal facts in the book for it to be taken as a serious foundation for an evolutionary cosmology. Despite these problems, however, it did seem that an evolutionary cosmology, bringing the isolated findings of sciences together through a law of developmental progress, needed to be taken much more seriously.

In the end, what the *Vestiges* did was not so much to convince readers that evolution was true, but that it could be talked about, debated and discussed. The subject could enter the public stage once again. This was particularly true from early 1850s onwards, when decades of political, social, economic and religious controversy in Britain began to subside. The 1850s witnessed increasing prosperity, the end of the 'hungry forties' and threats of Chartist insurrection. This was the era of

⁵ Mary Smith, *The Autobiography of Mary Smith, Schoolmistress and Nonconformist, a Fragment of a Life* (London: Bemrose, 1892), pp. 161-162.

the Great Exhibition, with Britain looking forward to becoming a great trading and imperial power. The move to reconsider an evolutionary origin for humanity was part of this expansive confidence.

What about Darwin's reaction to this? Darwin in the 1830s, around the time of his marriage, had theorized in secret, and early in 1844 he wrote up his views at the length of what (if published) would have been a short book. The theory he outlined was significantly different from that in *Vestiges*. Unlike *Vestiges*, which stressed an almost necessary progress through development, Darwin's model was more random and branching, as the famous diagram from his notebooks shows.

What did Darwin learn from reading *Vestiges*? In scientific terms it is fair to say that he did not learn anything that he did not know; the book brought a lot of different ideas together in a comprehensive and understandable way. However, in other ways Darwin did learn a number of important things, above all what the debate about his own work might look like. In his notebooks he had contemplated the public opprobrium that might face him were he to come before the public as a materialist. Now, suddenly, the issue was open, only a few months after he had completed a draft of his own work on the subject.

Darwin learned a great deal about what he might face from reviewers; and in general, the result was reassuring. He was surprised especially about how feeble and limited those criticisms appeared to be. The most sustained notice, Sedgwick's review in the *Edinburgh Review*, was long and packed with objections, but Darwin believed that he had met almost all of them. Moreover, it was apparent that a readership existed in Britain for evolutionary ideas, particularly those with a secure basis in science. Thus Darwin in many respects had less to worry about than he had thought, though it also became clear just how important his reputation in the relevant fields of science would be to the success of his theory. Notably, it was in the wake of the *Vestiges* debate that Darwin turned to a comprehensive study of the cirripedes, or barnacles. He wanted to establish his credentials, so that people would know he was not just another amateur, anonymous cosmologist, but a true man of science. Not only in geology, a field in which he was already well known; but also in other fields too, notably zoology. The result of this big project was four volumes on the taxonomy of both living and fossil barnacles.

Darwin thus gained immeasurably from the *Vestiges* controversy, both in terms of his own research but even more because of the way in which the field had been opened up to public discussion. Many readers who opened *On the Origin of Species* upon its publication in November 1859 were ready to believe that the evolution might be the case. They were just waiting for men of science to put their stamp of approval on it.

That was what effectively Darwin did. When the *Origin* was published, the title page was in an important sense a reply to that of *Vestiges*. Most important, it named an author, and specified that he was a fellow of scientific societies and the author of a respected travel book, the *Journal of Researches*. In addition, Darwin framed his book within a broadly theological context, quoting the Rev. William Whewell, Master of Trinity College in Cambridge, whose Bridgewater Treatise discussed the power and attributes of God as illustrated by astronomy:

But with regard to the material world, we can at least go so far as this—we can perceive that events are brought about not by insulated interpositions of Divine power, exerted in each particular case, but by the establishment of general laws.⁶

⁶ C. Darwin, *On the Origin of Species* (London: John Murray, 1859), p. ii.

If this sounds familiar, it is because almost exactly the same argument had been used by *Vestiges* a few years after Whewell's book had appeared. General laws, not specific acts of creation, were the way to understand the relationship of God with world. Whewell was a more orthodox and convincing source than *Vestiges*, which is why Darwin quoted him on this point; but the argument was shared and had of course much older precedents.

The *Origin* also begins with a quotation from Francis Bacon's *Advancement of Learning*:

... let no man out of a weak conceit of sobriety, or an ill-applied moderation, think or maintain, that a man can search too far or be too well studied in the book of God's word, or in the book of God's works; divinity or philosophy; but rather let men endeavour an endless progress or proficience in both.

This ideal of open enquiry, involving both the divine and the secular, is fundamental to establishing the legitimacy of the enterprise carried out in the rest of the text. The *Origin* gives a role to a god, and from the second edition onwards he famously added the word 'creator' to the final sentence. Therefore, Darwin was very much concerned to frame his book in the same context that had been long been established for such discussions, as it had been in *Vestiges*. If Darwin discussed theology far less than Chambers, it is not because he thought the issue unimportant (he had read and thought about it extensively), but for tactical reasons. He wanted the *Origin* to be read not as theology, but as science, alongside his books on geology and invertebrate zoology.

In thus shifting the genre of works on evolution from a concern with general developmental progress to the particular problem of species, Darwin drastically narrowed the range of the debate. The great philosophical and religious questions are marginal to the *Origin*, at least they rarely appear in the explicit construction of the argument. But readers knew what they were getting: an intervention in the same long-standing debate that had engaged them during the *Vestiges* controversy fifteen years before. Reading the *Origin* was inevitably shaped by the way in which its audience had been reading earlier books, and particularly *Vestiges*. In many ways, it was what Darwin did not say directly, but implied, that made his writing most attractive to readers. There was, famously, only one explicit sentence about the origin of human beings: 'Light will be thrown on the origin of man and his history'.⁷ The origin of life was mentioned only briefly towards the end; and only in the concluding sentence was reference made to the connection of evolutionary laws to astronomy and general cosmology. But readers knew what they were getting.

The significance of these incidental statements in the *Origin* can be interpreted in many ways. Perhaps the most influential position was developed by the naturalist and anatomist Thomas Henry Huxley. Huxley absolutely hated *Vestiges*, condemning it as an amateurish hotchpotch that undermined his campaign to establish science as a paid career. On this issue—if on little else—he agreed with Sedgwick, who was viewed by Herbert Spencer, George Eliot, George Henry Lewes and most of his London friends as an aging evangelical fanatic who didn't comprehend the direction that modern thought was taking. So although Huxley was among the younger generation attempting to free science from what were seen as theological shackles, on this issue he sided with a septuagenarian cleric. Why should this be the case? Put simply, Huxley thought the science in *Vestiges* emanated from the world of journalism, not of the laboratory and the field. Huxley looked to these places as new sources of authority for a scientific clerisy, and the case for natural causes in made in *Vestiges* appeared from this perspective shoddy and amateurish.

⁷ Darwin, *Origin*, p. 488.

What Huxley really wanted, and what he found in the *Origin*, was a way that closely argued specialist science could tackle large scale metaphysical questions traditionally posed in theological terms. Huxley realized that the framework for posing some of the most important aspects of these questions had been set by the post-enlightenment debate about creation by law. Now, because Darwin had taken up the crucial keystone of the issue, the problem of species, specialist science had the potential for finding answers. Significantly, Huxley did not think that natural selection was the right explanation for the origin of species, as it had not been demonstrated experimentally. But he realized that at last there was scientific explanation to discuss and debate; hence his celebrated remark, ‘how extremely stupid not to have thought of that!’⁸ Natural selection might not be the right explanation, but at least it had the form of science. From this point of view, Darwin might not have correctly explained any of the key topics dealt with in the *Origin*—but the book had brought the whole subject of creation into the realm of science.

On the Origin of Species, in that sense, became the flag of the new party in science that Huxley and his friends represented: a scientific, imperial Britain based on free trade, political liberalism, and a secular evolutionary cosmology. Huxley saw this very strongly, and coined the word ‘Darwinism’ to encourage the broadest possible implications for this ‘new reformation’.

As I have suggested, when we reduce Darwin to an icon, we tend to forget the whole history of the evolution before Darwin, not only Robert Chambers, but many figures I have not mentioned here, particularly those from continental Europe. One author who often comes up in this context is the co-discoverer of natural selection, Alfred Russel Wallace. Wallace was a great traveler and a wonderful writer. He published important works on biogeography and an extraordinary range of other subjects, from land reform and spiritualism to the plumage of birds of paradise.

But it would be a great mistake to believe that the way to correct the overbalance of attention devoted to Darwin, is to substitute it with studies of Wallace, or Chambers, or any of the other individual authors. Instead, we need to understand, from a broad perspective, what intellectual discussion and debate were about. Books did not transform the debate; readers did. It was the way thousands of readers talked about and thought about *Vestiges* that changed the way in which a very controversial subject was tackled during the nineteenth century. When the *Origin* appeared, the discussion was much less tough, and far less heated, than most people realize today. Despite our images of warring factions and angry sermons from parish pulpits, there was no great battle between science and the Church. The kind of criticism Sedgwick gave the *Origin* was rare. (It is not often realized that one of the book’s most notorious opponents, the anatomist Richard Owen, was a long-standing advocate of naturalistic explanations of species; what he disputed was Darwin’s particular evolutionary explanation.) As Darwin himself acknowledged, *Vestiges* had served as a lightning rod to draw down the criticism. Making a new world was never going to be the product of one book, but rather was bound up with the larger transformation of cultural and intellectual life in Britain during the nineteenth century.

We are celebrating Darwin in 2009 for reasons that have much to do with what we think of evolution now, both in its relationship to religion and its role within science. It is threatened by ill-judged campaigns from in the United States and many other parts of the world; and yet—partly though genomics—has become more central than ever before to biological research. These are

⁸ T. H. Huxley, ‘On the Reception of the “Origin of Species”’, in F. Darwin (ed.), *The Life and Letters of Charles Darwin, Including and Autobiographical Chapter*, 3 vols. (London: John Murray, 1887), vol. 2, pp. 197.

central features of the current situation. But when we think of the history of evolution, we also need much broader perspectives. The reason for Darwin's success is hidden in the wider history of reading and understanding that has been my focus.

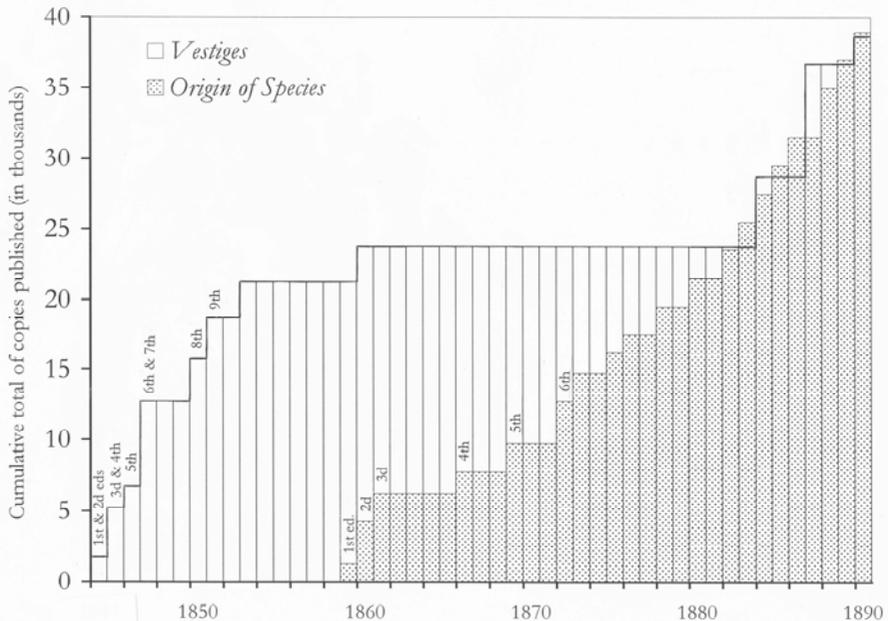


Figure 5

Take this chart (Figure 5), which shows the number of copies of *Vestiges* versus those of *On the Origin of Species* during the course of nineteenth century. In October 1844, the first edition of *Vestiges* was published in a cautiously small edition of 750 copies, but by the time of the *Origin* it had sold the remarkable figure of over 20000—a very large number for any scientific book. The *Origin* sold well, with the first edition of 1250 copies being entirely sold out to the trade in November 1859; but nothing in comparison. It took many decades to catch up, with overall sales of the *Origin* only exceeding *Vestiges* by the 1890s. And it is important to remember that a wide range of other, non-Darwinian, progress-oriented books discussing evolution were being issued as well.

The actual history of the evolutionary debates lies somewhere between these statistics and the stories of individual readers with which I began this talk. To understand the issues, we need to focus neither exclusively on Darwin, nor on a narrowly intellectual history of evolutionary doctrines, but on the questions readers posed when they opened a book, and what their authors hoped to accomplish in writing them. *Vestiges* and the *Origin*, along with thousands of related works, were written not to provide definitive answers, but to ask questions and extend the boundaries of understanding. Chambers's own words, published in the sequel to *Vestiges*, suggest what was at stake, and the need for science to tackle such issues:

When the awakened and craving mind asks what science can do for us in explaining the great ends of the Author of nature, and our relations to Him, to good and evil to life and to eternity, the man of science turns to his collection of shells or butterflies, to his electric machine or his retort, and is mute as a child who, sporting on the beach, is asked what lands lie beyond the great ocean which stretches before him.⁹

Further Reading

P. Bowler, *Evolution: The History of an Idea*, 3d ed. (Berkeley and Los Angeles, 2003).

J. Browne, *Darwin's Origin of Species: A Biography* (London: Atlantic Books, 2006).

A. Desmond, *The Politics of Evolution: Morphology, Medicine, and Reform in Radical London* (Chicago: University of Chicago Press, 1989).

M. J. S. Hodge, "'The Universal Gestation of Nature'" Chambers' 'Vestiges' and 'Explanations'". *Journal of the History of Biology* 5: 127-51.

J. A. Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of Vestiges of the Natural History of Creation* (Chicago: University of Chicago Press, 2000).

Figure Captions

Figure 1. Logo for 'Darwin200' in the United Kingdom.

Figure 2. Title pages of the first editions of *Vestiges* and *Origin*.

Figure 3. Comparative sections of the brains of adult organisms, ranging from the cuttlefish to man. The dotted line marks the posterior boundary of the cerebral hemispheres. From J. Fletcher, *Rudiments of Physiology* (Edinburgh: John Carfrae and Son, 1835-7), pp. 47-48.

Figure 4. [Horace Mayhew], 'The Book That Goes A-begging', *Punch*, 11 Dec. 1847, p. 230.

Figure 5. Comparative chart showing the number of copies of *Vestiges* and *Origin* published in 1844-1890. From Secord, *Victorian Sensation* (Chicago, 2009), p. 526.

⁹ [R. Chambers], *Explanations, A Sequel* (London: John Churchill, 1845), p. 178.