

Did Darwin plagiarize Patrick Matthew?

Dominic Statham

There can be no doubt that Patrick Matthew preceded Darwin in articulating the theory of evolution by natural selection. Darwin claimed that he knew nothing of Matthew's work prior to publishing the *Origin of Species*. Some doubt this, arguing that in places his early writings appear too similar to Matthew's to be explained by coincidence. The book in which Matthew documented his theory was well known among naturalists and it would seem unlikely that Darwin would not have read it.

In 1831, the Scottish laird Patrick Matthew (1790–1874; figure 1)^{1,2} published a substantial work titled *On Naval Timber and Arboriculture (NTA)*.³ Its primary subject was how to grow trees so as to provide Britain's warships with the best quality timber. As the owner and manager of a large orchard, Matthew had extensive experience of husbandry and breeding. This led him to speculate about what he termed 'the natural process of selection' and how it could have driven changes in plants and animals over long periods of time. Following the French naturalist Georges Cuvier, Matthew believed in an ancient Earth which, during the course of its long history, had been subject to periodic catastrophes—great floods that had wiped out many plants and animals across the earth. In Matthew's thinking, after each catastrophe, new types of organisms had arisen, as the creatures that survived the floods spread out into the newly created environments. This, he thought, explained why the different rock layers contain different fossils.

Matthew's treatise included the two pillars of what became known as Darwin's theory of evolution: variation and selection. Of variation, he wrote that it is "one of the most evident traits of natural history, that vegetables as well as animals are generally liable to an almost unlimited diversification"⁴, and of selection:

"There is a law universal in nature, tending to render every reproductive being the best possibly suited to its condition ... to their highest perfection, and to continue them so. This law sustains the lion in his strength, the hare in her swiftness, and the fox in his wiles ... those individuals who possess not the requisite strength, swiftness, hardihood, or cunning, fall prematurely without reproducing—either a prey to their natural devourers, or sinking under disease ... their place being occupied by the more perfect of their own kind, who are pressing on the means of subsistence."⁵

Unambiguously anticipating Darwin, Matthew wrote of the "circumstance-adaptive law, operating upon the slight but continued natural disposition to sport [i.e. produce variation] in the progeny"⁶.

Richard Dawkins, keen to protect Darwin's reputation, claimed, "Matthew seems to have seen selection as a purely

negative, weeding-out force"⁷. This, however, is clearly wrong. For example, Matthew wrote of how "the progeny of the same parents, under great difference of circumstance, might, in several generations, even become distinct species, incapable of co-reproduction."⁸

On reading of Darwin's *Origin of Species*, Matthew wrote to the *Gardeners' Chronicle*, asserting his priority to the theory of evolution by natural selection in no uncertain terms:

"In your Number of March 3rd I observe a long quotation from the *Times*, stating that Mr. Darwin 'professes to have discovered the existence and *modus operandi* of the natural law of selection', that is, 'the power in nature which takes the place of man and performs a selection, *sua sponte*', in organic life. This discovery recently published as 'the results of 20 years' investigation and reflection' by Mr. Darwin turns out to be what I published very fully and brought to apply practically to forestry in my work 'Naval Timber and Arboriculture', published as far back as January 1, 1831 ..."⁹

Darwin's reply appeared in the same magazine a fortnight later:

"I freely acknowledge that Mr. Matthew has anticipated by many years the explanation which I have offered of the origin of species, under the name of natural selection. I think that no one will feel surprised that neither I, nor apparently any other naturalist, had heard of Mr. Matthew's views, considering how briefly they are given, and that they appeared in the appendix to a work on Naval Timber and Arboriculture. I can do no more than offer my apologies to Mr. Matthew for my entire ignorance of his publication. If another edition of my work is called for, I will insert a notice to the foregoing effect."¹⁰

This he did in the third edition of the *Origin of Species*:

"In 1831 Mr Patrick Matthew published his work on 'Naval Timber and Arboriculture', in which he gives precisely the same view on the origin of species as that ... propounded by Mr Wallace and myself ..."¹¹

A plausible excuse?

Some scholars have questioned Darwin's honesty in making the claim that he had not heard of Matthew's views.¹² Moreover, it is difficult to take seriously the opinion expressed in Wikipedia, that "there is no evidence whatsoever that Darwin had read the book".¹³ Loren Eiseley, formerly Professor of the History of Science at the University of Pennsylvania, argued that Darwin clearly drew upon *NTA* in essays he wrote in 1842 and 1844.¹⁴ For example, Matthew refers to the 'natural process of selection'; Darwin refers to the 'natural means of selection'. In *NTA*, Matthew observes that under domestication, due to man's interfering with this 'natural process of selection', greater varieties of plants have arisen:

"Man's interference, by preventing this natural process of selection among plants, independent of the wider range of circumstances to which he introduces them, has increased the difference in varieties, particularly in the more domesticated kinds ..."¹⁵

In his 1842 essay, referring specifically to arboriculture, Darwin makes exactly the same point:

"In the case of forest trees raised in nurseries, which vary more than the same trees do in their aboriginal forests, the cause would seem to lie in their not having to struggle against other trees and weeds, which in their natural state doubtless would limit the conditions of their existence."¹⁶

Another example is Darwin's apparent regurgitating of Matthew's law of "adaptation to condition"¹⁷ leading to a general uniformity within species. In *NTA* Matthew wrote:

"... a considerable uniformity of figure, colour, and character, is induced, constituting species; the breed gradually acquiring the very best possible *adaptation* of these *to its condition* [emphasis added] ..."¹⁸

Similarly, in his 1844 essay Darwin argued,

"How incomparably 'truer' [i.e. more uniform] then would a race [be] produced by the above rigid, steady, natural means of selection, excellently trained and perfectly *adapted to its conditions* [emphasis added] ..."¹⁹

Yet another example is Darwin's reference to 'long-continued selection',²⁰ the exact same phrase used by Matthew in *NTA*.²¹ Darwin may, however, have read this same phrase in a book by David Low on plant cultivation and animal husbandry.²²

Hugh Dower also makes a case for Darwin having read Matthew before publishing the *Origin of Species* in 1859.²³ A review of *NTA* appeared in the 1832 edition of *The Gardener's Magazine*,²⁴ which mentioned Matthew's views on "the origin of species and varieties". Darwin had clearly read this edition as he referred to it in a letter²⁵ and in a footnote on p. 69 of his *Natural Selection* manuscript,²⁶ both of which

were penned prior to 1859. Volume 3 of John Loudon's legendary *Trees and Shrubs of Britain* (1838)²⁷ refers to Matthew and *NTA* nine times. Since Darwin cites this very volume twice in *Natural Selection* it would seem most unlikely that he had not read these passages—particularly as, in one case, the page he refers to (p. 1374) is so close to one which quotes Matthew (p. 1380).

Matthew's letter to the *Gardeners' Chronicle* claiming priority for the theory of evolution was published on 7 April 1860. Three days later, on the 10th, Darwin penned a letter to Charles Lyell in which he discusses Matthew's letter and states that he had ordered a copy of *NTA*;²⁸ then, three days after that, on the 13th, Darwin wrote to Joseph Hooker making clear that he had read it.²⁹ Dower remarks that it seems unlikely that Darwin, living in the 19th century, and at home in Downe over Easter, would have obtained and read the book within just six days. Dower considers it more likely that Darwin, in fact, already had a copy.

An obscure writer?

Darwin's reference to Matthew as "an obscure writer on forest trees"³⁰ and his suggestion that, perhaps, no other naturalist knew of Matthew's work¹⁰ appear hollow in



Fig. 1. Patrick Matthew (1790–1874).

the light of the facts. Matthew owned the largest orchard in Scotland and his work was quoted by researchers not only in Scotland and England but also the USA and India. Moreover, he was clearly known to a number of prominent naturalists as they actually cited his work. These included John Loudon, Prideaux John Selby, and Cuthbert Johnson. Loudon was a towering figure in the world of 19th-century botany, publishing, among others, *The Encyclopaedia of Agriculture*, the *Gardener's Magazine*, the *Magazine of Natural History*, and his *magnum opus*, *Trees and Shrubs of Britain*. He was likely well acquainted with *NTA* as it was his *Gardener's Magazine* that had published the review mentioning its dealing with “the origin of species and varieties”.²⁴ He had probably also given some thought to natural selection as Edward Blyth had published his papers on this subject in Loudon's *Magazine of Natural History*.^{31–33} Selby was another renowned 19th-century naturalist who was well acquainted with Matthew, citing him numerous times in his *History of British Forest Trees* and referring to *NTA* as “a valuable treatise on Naval Timber”.³⁴ Selby also edited Alfred Russel Wallace's 1855 paper on evolution, written while Wallace was in Sarawak, Borneo.³⁵

Indeed, Darwin's contention that probably no other naturalists knew of Matthew and his views utterly crumbles in light of even a moderate amount of research. An advertisement for *NTA*, taking up more than half a page, can be found in the opening pages of volume 4 of the seventh edition of *Encyclopaedia Britannica*, published in 1832 (figure 2). Matthew's book would have seemed essential reading for Darwin as the advertisement made clear that “the interesting subject of Species and Variety is considered ... and the causes of the variation ... pointed out”. Volume 21 of the same edition also cites Matthew and describes *NTA* as “a work which abounds in much sound practical information”. Although the 17th edition of *Encyclopaedia Britannica* is known as the ‘1842 edition’ it was published in stages between March 1830 and January 1842, making the contents available to Darwin before he wrote his 1842 essay in June of that year.³⁶ Large advertisements for *NTA* were also placed in *Quarterly Literary Advertiser* (January and November 1831) that again mentioned “the interesting subject of Species and Variety”. Advertisements and reviews also appeared in many other publications.³⁷

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Fig. 2. Advertisement for *NTA* placed in volume 4 of the seventh edition of *Encyclopaedia Britannica* (1832).

An obscure publication?

Using a method he refers to as “Internet Date-Detection” or the “ID Research Method”, criminologist Dr Mike Sutton provides strong evidence that *NTA* was, in fact, widely read.³⁸ Many 18th- and 19th-century books have now been scanned and can be Google searched using a date filter. This enables researchers to discover who first used—and therefore probably originated—certain phrases. For example, using this method, Sutton demonstrated that Patrick Matthew was the first to coin the phrases ‘natural process of selection’, ‘long continued selection’, ‘admixture of species’, ‘threatened ascendancy’, ‘sport in infinite varieties’, ‘adapted to prosper’, ‘greater power of occupancy’, ‘power to permeate’, and many more. What is significant, however, is that many of Matthew's original phrases appear in literature written soon after he first penned them. For example, in 1834, Conrad apparently reproduced Matthew's phrase ‘admixture of species’; in the same year, Low referred to ‘long continued selection’; in 1837, Wilson wrote about ‘threatened ascendancy’; in 1841, Johnson used the phrase ‘adapted to prosper’; and in 1842, Selby used ‘greater power of occupancy’.³⁹ Remarkably, Robert Chambers, in his review of the first edition of the *Origin of Species*, used Matthew's phrase, ‘natural process

of selection' rather than Darwin's phrase 'process of natural selection'.⁴⁰ Chambers was the author of the infamous 1844 pro-evolutionary treatise *Vestiges of Creation*, and must have known of *NTA* because it was cited in a journal he had edited in 1832.⁴¹

Darwin's excuse that Matthew's theory of evolution appeared only "in the appendix to a work on Naval Timber and Arboriculture" also seems lame. Matthew referred to both variation and selection in the main part of his book as well as in the appendix, examples being his reference to plants and animals as "generally liable to an almost unlimited diversification" (p. 106), the principle of 'greater power of occupancy' (p. 302), and the term 'natural process of selection' (p. 308). Moreover, a work on arboriculture would have been of great interest to Darwin, especially one dealing with fruit trees. The first sentence of Darwin's first notebook on evolution⁴² refers to these, and later, in the same notebook, he mentions crab apples and specifically the Golden Pippin, a variety which Matthew grew in his orchard. Again, twenty pages later, Darwin refers to a discussion of Pippin trees with William Fox. Interestingly, Matthew had written about these in a letter published in *Memoirs of the Caledonian Horticultural Society*, a magazine that Darwin had very likely read as it appears in his 'Books to be Read' notebook.⁴³

An unnoticed work?

Darwin's claim that he had never heard of *NTA* stretches credibility a long way. Before publishing the *Origin of Species*, he had spent over 20 years searching for every scrap of information he could find about species, varieties, and breeding. He moved in privileged circles, had a very wide correspondence and knew many leading naturalists. Selby, who was very familiar with *NTA*, and had edited Wallace's papers on evolution, was a fellow member of the Linnean Society. Chambers, who may well have known Matthew,⁴⁴ and whose *Edinburgh Journal* referred to him on two occasions,^{41,45} was a fellow member of the Geological Society of London and was clearly acquainted with Darwin as they engaged in correspondence.⁴⁶ In fact, Chambers even gave him a copy of his *Vestiges of Creation*.⁴⁷

Whereas in the UK today there are hundreds of publishers of scientific literature, in the 19th century there were very few, and they comprised a much more tightly-knit community. For example, Chambers, a publisher himself, would certainly have known Adam Black, the publisher of *NTA*, as they were both Scots and Fellows of the Royal Society of Edinburgh—along with Selby. John Murray, the company that published the *Origin of Species*, also published the *Quarterly Review*, which had, in 1833, included an article that discussed Matthew and *NTA*.⁴⁸ The father of Joseph Hooker, a close

friend of Darwin, had one of his books reviewed in the same volume which contained Loudon's review of *NTA*.⁴⁹

Of those associated with Darwin's social network and who definitely read *NTA*, Selby was probably the best connected. Sutton comments:

"[Selby was] closely associated with William Hooker, Charles Lyell, Thomas Huxley and, most importantly, with Darwin by way of their mutual senior capacities at the British Association for the Advancement of Science and the Linnean Society. Selby was a very close friend of Darwin's great friend Leonard Jenyns Jenyns wrote a book about Selby in which he recorded visiting him at his home along with none other than Darwin's father. Given Selby's obvious enthusiasm for *NTA*, his interest in Matthew's natural selection concept of 'greater power of occupancy' and his obvious respect for its author's knowledge of arboriculture, it seems highly unlikely that he would not have discussed *NTA* at the very least with other connected gentlemen of science. For this scientists get together and establish such societies, associations, clubs, committees and standing conferences, and it was at these gatherings where Selby mixed with both Darwin and Darwin's closest friends, many of whom Jackson reveals were his house guests."⁵⁰

In the light of this well-documented evidence, is it really plausible that nobody had drawn Darwin's attention to Matthew's well-publicized, well-read book, which dealt specifically with the very subject Darwin was so well-known for studying? It has been argued that, had Darwin known of Matthew, some incriminating evidence would have been found in his now fully searchable correspondence. However, other very significant letters have mysteriously gone missing, such as those Darwin received from Alfred Wallace over a three-year period. Wallace researcher Dr Barbara Beddall considered this "very odd" and concluded that someone had "cleaned up the file".⁵¹

Darwin—the perfect gentleman?

A number of commentators have drawn attention to Darwin's apparent unwillingness to credit others when he built on their work. Samuel Butler, for example, one of Darwin's contemporaries, accused him of passing over Buffon, Lamarck, and even his own grandfather, Erasmus.⁵² Eiseley makes a good case for Darwin not only plagiarizing Matthew, but also drawing substantially from Edward Blyth in his 1844 essay and the *Origin of Species*.⁵³ Yet, although Darwin mentioned Blyth on a number of occasions, he did not cite his papers on natural selection even though he unquestionably knew of them. Similarly, Eiseley argued that he drew from Carl Vogt in writing *The Descent of Man*.⁵² Darwin biographer Ronald Clark also recognized

the likelihood of Darwin having read *NTA*, opining, “Only the transparent honesty of Darwin’s character ... makes it possible to believe that by the 1850s he had no recollection of Matthew’s work.”⁷⁵⁴ Others, however, might consider the weight of evidence against him to be just too strong.

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Dominic Statham is a chartered engineer and graduate of Loughborough University in the UK. He has twentyfive years experience in aeronautical and automotive engineering, with Rolls Royce (Aero and Industrial & Marine Divisions) and GKN, a leading supplier of automotive driveline components. He has extensive experience of both manufacturing and product development, and holds a number of patents. He is the author of *Evolution: Good Science? Exposing the ideological nature of Darwin’s theory*