

Alfred Russel Wallace, co-author of the Darwin-Wallace Theory of Evolution

Stefan A. Revets

University of Western Australia,
School of Earth and Environment,
35 Stirling Highway M004, Crawley WA 6008

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Abstract

The intellectual effort, insight and courage to formulate a theory of evolution driven by natural selection was as great for Wallace as it was for Darwin. The neglect, to the point of oblivion, in the last decades of Wallace as Darwin's equal is not acceptable. To help and attempt to redress the balance, a sympathetic sketch of Wallace is called for. Through his publications, correspondence and life history, we gain a picture of Wallace which should encourage us to extend to him the credit to which he is very much due.

Keywords: evolutionary theory; Wallace; Darwin

Introduction

Alfred Russel Wallace is an intriguing figure. With the explosive growth of a Darwin Industry, Wallace has receded to the point where today all too few are aware of his important place in the development of the theory of evolution through natural selection.

It is hardly possible to talk about Wallace and not bring Darwin into the discussion. Of course, it is more often the case that Wallace is mentioned, in passing or even not at all, in the multitude of works on Darwin and evolutionary theory.

In order to get a better idea of who the man Wallace was, it is enlightening to look into the circumstances of his family and to how he grew up.

Biography

Alfred Russel Wallace was born to Thomas Vere Wallace and Mary Ann Greenell at Usk, Monmouthshire, on 8 January 1823, the eighth of nine children, and the third of four boys.

Thomas Vere Wallace, hailed from Hanworth in Middlesex, and was the only son of an inn-keeper. After his schooling, he was articled to a firm of solicitors in London, and from where he became an attorney-at-law in 1792. He never practised as he came into some property which provided him with a modest but good income. It allowed him to live a quiet life, without any systematic occupation. He just enjoyed himself within his means, as a fairly well-to-do middle-class gentleman.

In 1807, he married Mary Ann Greenell and soon the family began to grow. They eventually had nine children and father Wallace had to try to improve his income. As he was not very business minded, nor very energetic, these attempts were at first unsuccessful and ultimately disastrous. It meant that the family had to move

repeatedly to more affordable accommodation, first out of Marylebone, then out of Southwark, then out of Usk, and on to Hertford. At Usk, where the last two children were born (Alfred and Herbert), he managed to keep just one servant, cultivating the land himself and providing his family with fruit and vegetables, teaching the children himself. It seems that life there was rather a happy one.

By 1835, he was swindled out of what property he had left, making life very difficult indeed for the family. They had to make do on the small marriage settlement of his wife, and what income he could make by taking on pupils and by acting as librarian to a subscription library. One of Alfred's older sisters set up a small boarding school for young ladies in Hoddleston, which helped as well. At any rate, those of the children who reached their majority had nothing to start them on in life with exception of a very ordinary education, and had to fend for themselves.

Alfred's eldest brother, William, was articled to a firm of surveyors, then spent time with an architect and moved on to work for a large building company involved in the construction of King's College. He managed to get a good professional education and one from which Alfred was soon to profit.

Alfred remembered his childhood at Usk and Hertford as a very happy one, and was largely unaware of the lack of money in the house. In his youth he had ample opportunity to play along the river and in the surrounding woods and fields. He thoroughly enjoyed helping out his elder brothers with making the things there was no money for. The *Boy's Own Book* was a most valuable guide to them. It taught him self reliance and ability to improvise, something that would stand him in very good stead later in life.

When Alfred was 5, the family moved to Hertford where he attended the local grammar school. He "suffered" Latin grammar and geography as two most painful subjects. In his last year at school, he acted as assistant which served instead of paying the fee. He disliked this special position and it reinforced his shyness even further.

Books were a major influence on Alfred. His father belonged to a book club and a constant stream of books came through the house. Later on, when his father took up the position of librarian, Alfred would spend time in the library and read.

When the finances of the family collapsed, Alfred had to leave his schooling (at the age of not yet 14), and was sent to live with an older brother, John, in London, before moving in with his eldest brother, William, and training as a surveyor.

While in London, he began to frequent the Hall of Science, a sort of club or institute set up for *advanced thinkers amongst workmen*, particularly for followers of Robert Owen and his socialist movement. Here too, Alfred learned a great deal that shaped him as a man. His views on politics and religion developed quickly and thoroughly.

From the summer of 1837, he joined his brother William on his surveys and acquired a variety of skills. He eagerly began to learn trigonometry, got excited by precision measurements and enjoyed learning the use of the sextant and the slide-rule. It awakened in him the thirst for knowledge and he obtained books to help him along. Tramping all over the land, he also observed Nature and began to appreciate the natural diversity. It also exposed him to the diversity of his fellow man, and the shy, observant Alfred again learned a great deal.

When there was a gap in work, Alfred was often left to his own devices, and he would spend the time practising nautical astronomy but engaged in more and more rambling among the moors and mountains. In 1841, he obtained his first booklet on plants, which included descriptions of the more common British plants. This proved to be a revelation to Alfred, and he would spend more and more of his spare time trying to identify the plants he sought out on his rambles. Eventually, he bought, at quite some cost Lindley's *Elements of Botany*. Although it was not what he had hoped for initially, it gave him a much better grasp of systematic botany. He managed to borrow Loudon's *Encyclopedia of Plants* which contained all British Plants. Alfred would spend many hours copying out descriptions so he could use these to help him identify the plants he found. He found it helpful to construct his own herbarium as well, even if William did not really approve. But:

Neither he nor I could foresee that it would have any effect on my future life, and I myself only looked upon it as an intensely interesting occupation for time that would be otherwise wasted. Even when we were busy I had Sundays perfectly free, and used then to take long walks over the mountains with my collecting box, which I brought home full of treasures. I first named the species as nearly as I could do so, and then laid them out to be pressed and dried. At such times I experienced the joy which every discovery of a new form of life gives to the lover of nature, almost equal to those raptures which I afterwards felt at every capture of new butterflies on the Amazon, or at the constant stream of new species of birds, beetles, and butterflies in Borneo, the Moluccas, and the Aru Islands.

In the autumn of 1843, Alfred began to write. One of the earliest manuscripts was a sketch for a popular lecture on botany. He wrote it, partly because of the difficulties he himself experienced in getting information but largely because of a lecture he had attended. What a local botanist had given was such a meagre, uninteresting and so utterly unlike what a lecture ought to be that Alfred felt that he should try and do better. The botanist had enumerated the whole series of the Linnaean Classes and Orders, giving the characters and naming a few representatives. He had upheld the Linnaean system as the most useful, while the natural system was treated as useless for beginners and only suited for experienced botanists. This incensed the young Alfred:

All this was so entirely opposed to views I had already formed, that I devoted a large portion of my lecture to the question of classification in general, showed that *any* classification, however artificial, was better than none, and that Linnaeus made a great advance when he substituted generic and specific names for the short Latin descriptions of species before used, and by classifying all known plants by means of a few well-marked and easily observed characters. I then showed how and why this classification was only occasionally, and as it were accidentally, a natural one; that in a vast number of cases it grouped together plants which were essentially unlike each other; and that for all purposes, except the naming of species, it was both useless and inconvenient. I then showed what the natural system of classification really was, what it aimed at, and the much greater interest it gave to the study of botany. I explained the principles on which the various natural orders were founded, and showed how often they gave us a clue to the properties of large groups of species, and enabled us to detect real affinities under very diverse external forms

In 1843, his father dies at the age of 72, and barely a year later, just after turning 21, his brother William tells him there is not enough work and that he will have to fend for himself.

Alfred finds a position as junior school assistant with the Rev. Abraham Hill, headmaster of the Collegiate School at Leicester. He takes the junior classes in English, reading, writing and arithmetic as well teaching a few boys some surveying and drawing. He settles in well and has the time to improve himself further, mainly in Algebra, Differential Calculus (although he gets "stuck" on Integral Calculus), and he works on Latin as well. He profited from the very good town library and enjoyed reading books such as von Humboldt's *Personal Narrative of Travels in South America*, Prescott's *History of the conquests of Mexico and Peru*, as well as Malthus' *Principles of Population*. This book he greatly admired for its masterly summary of facts and logical induction to conclusions.

It was at Leicester where Alfred was introduced to mesmerism. He was rather impressed, tried it himself and succeeded. With the permission of the headmaster,

he ran a series of experiments which convinced him of the reality of the phenomenon.

It was also at Leicester, in all likelihood in the library, that Alfred first met Henry Walter Bates, an enthusiastic entomologist. The two young men got on straight away, and Bates opened Wallace's eyes to the diversity of insect life. Soon they would be spending their spare time collecting together.

In February 1846, Alfred received news that William had died. As he had died intestate, Alfred discovered that William had had a small local business, which he proposed to continue. He obtained his release from the School of the Rev. Hill, and moved to Neath. It took him and his brother John a while to wind up William's affairs (quite a bit of money was due to him), and then Alfred took up surveying again. He diversified a bit into building with John and one of the buildings they designed and oversaw the construction of was a house for the Mechanics' Institute in Neath. Mr. William Jevons was behind the establishment of the Institute, and invited Alfred to give some lectures at the Institute on elementary physics, mechanics and science in general. He did so, at first reluctantly, but the series ran for two years, and they were popular. Many years later, Alfred received a letter from a workman who attended the Neath Mechanics' Institution, asking if the author of *Island Life*, *The Malay Archipelago* and other books is the same Mr. Alfred Wallace who taught in the evening classes at the Neath Abbey artificers:

I have often had a desire to know, as I benefitted more while in your class—if you are the same Mr. A. Wallace—than I ever was taught at school. I have often wished I knew how to thank you for the good I and others received from your teaching (Matthew Jones, Cardiff, 1895)

The contact with Bates continued to flourish, not just with letters, but also through joint collecting trips. In the summer of 1847, Bates came up to Neath again, and besides collecting, mounting and exchanging specimens they discussed the books they had read, notably Charles Lyell's *Principles of Geology* and Robert Chambers' *Vestiges of the Natural History of Creation*. Clearly, Alfred was already engrossed in the question of the origin of species.

He had also gone through Darwin's Journal and having read von Humboldt's *Personal Narrative* a few years earlier and found in them the inspiration to visit the tropics as a collector, something he discussed now with Bates. A few weeks later, coming back from a visit to Paris with his sister, Alfred again wrote to Bates. Referring to a day spent in the insect room at the British Museum; he writes:

I begin to feel rather dissatisfied with a mere local collection; little is to be learnt by it. I should like to take some one family to study thoroughly, principally with a view to the theory of the origin of species. By that means I am strongly of opinion that some definite results might be arrived at

When Alfred and Henry read W. H. Edwards' *A Voyage up the Amazon*, they felt that this was the very place for them to go to. The advice they obtained from

Edward Doubleday, lepidopterist of the British Museum, confirmed their hopes and intentions. They found an agent in Samuel Stevens, who would remain Alfred's agent for all his collecting trips.

The two naturalists were all set to sail on 20 April 1848 on the *Mischief* to Para (now Belem). The story of their adventures is delightfully told in Wallace's *Travels on the Amazon* and in his autobiography.

Wallace lost nearly everything on the journey back to London when the ship caught fire and had to be abandoned. All made it safely to shore in the end by October 1852. Wallace had managed to save just a few things in a small tin box. Together with the letters he had written and the drawings he had saved, he began to write up an account of his travels. He could also write some more scientific papers on the specimens he had sent before travelling up the Rio Negro. He received an insurance pay-out which allowed him to continue on for a while at least. His collections and his writings brought him to the attention of Zoological and Entomological Societies and he began to mingle in the scientific circles of the time. Soon after his return, he met Thomas Henry Huxley for the first time, and was very impressed.

He was looking for another opportunity of making a large collection, and picked up from his attendances of meetings and visits to collections that the Malayan Archipelago would offer wonderful riches to the exploring and collecting naturalist. He had made the acquaintance of Roderick Murchison, President of Royal Geographical Society and appealed to him for help. Murchison was very helpful and agreed to use his considerable influence to secure Wallace passage to some Malayan port. While this was being negotiated, Wallace spent much of his time examining collections at the British Museum, once again making copious notes and sketches of birds, butterflies and beetles of the Malay Islands. In January 1854, Wallace got word that he could join the *Frolic* and by February he presented himself at Spithead, Portsmouth. But because of the Crimean War, the plan was abandoned and, through Murchison's representations, Wallace secured a first-class ticket overland to Singapore by the next Peninsular and Oriental Steamer. He arrives in Singapore on 20 April 1854 and travels and collects in the Malay Archipelago until 20 February 1862. *The Malay Archipelago* and chapters in *My Life* give ample and engrossing details of the six years he spent there.

He wrote his first contribution to the question of the origin of species in early 1855 during the wet season in Sarawak. There was nothing else to do but read and think, which led to his *On the Law Which Has Regulated the Introduction of New Species*, published in the *Annals and Magazine of Natural History* (1855). The law he proposed reads:

Every species has come into existence coincident both in space and time with a pre-existing closely allied species

To Wallace's surprise, no one seemed to have noticed it. Lyell and Blyth had drawn Darwin's attention to it and Huxley would later praise "the powerful essay". Darwin's copy of the journal is annotated with some comments and largely with approval.

In January 1858, in one of the many letters he wrote to Bates we find that:

I fear my paper on the *Succession of Species* will not appear so clear as it does to you. That paper is, of course, merely the announcement of the theory, not its development. I have prepared the plan and written portions of a work embracing the whole subject, and have endeavoured to prove in detail what I have as yet only indicated. It was the promulgation of Forbes's theory of *polarity* which led me to write and publish, for I was annoyed to see such an ideal absurdity put forth, when such a simple hypothesis will explain all the facts. I have been much gratified by a letter from Darwin, in which he says that he agrees with *almost every word* of my paper. He is now preparing his great work on *Species and Varieties*, for which he has been collecting materials for twenty years. He may save me the trouble of writing more on my hypothesis, by proving that there is no difference in nature between the origin of species and of varieties; or he may give me trouble by arriving at another conclusion; but, at all events, his facts will be given for me to work upon. Your collections and my own will furnish most valuable material to illustrate and prove the universal applicability of the hypothesis. The connection between the succession of affinities and the geographical distribution of a group, worked out species by species, has never yet been shown as we shall be able to show it

Two months later, the solution for the origin of species dawned on him, recalling Malthus' *Principles of Population* he had read 12 years before. He sends off a manuscript entitled *On the Tendency of Varieties to Depart Indefinitely From the Original Type* with a letter to Darwin. The crisis that this letter wrought has been well documented, as well as its neat resolution in the joint reading of Wallace's and Darwin's writings on natural selection at a special meeting of the Linnean Society on 1 July 1858.

In November 1859, *On the Zoological Geography of the Malay Archipelago*, the paper describing what was later to be known as The Wallace Line, is read before the Linnean Society and Darwin's *On the Origin of Species* is published. On 1 April 1862, Wallace arrives back in Britain.

Thanks to the sales from his substantial collections, he gathered the means with which he hoped would allow him to retire to a quiet life and live as a country gentleman. Of course, he had to deal with the collections first and it occupied him a full three years. During that time he wrote revisions, interpretative works and presented papers at a multitude of professional meetings. He met most of the important English naturalists and many became friends. He had achieved his most cherished dream.

In 1866, he married Annie Mitten (then 18), eldest daughter of William Mitten of Hurstpierpoint (an enthusiastic botanist who inculcated the love of wild flowers and nature's beauty into his daughter). They

had three children, Herbert Spencer, William Randolph and Violet. By all accounts, the marriage was a very happy one.

In the first years after his return he was generally regarded as a staunch defender of Darwinism, even considered to be more Darwinian than Darwin himself. However, on the subject of the evolution of man their analysis diverged. From the late 1860s onward, spiritualism began to play a prominent role in Wallace's view of man, and despite his experiments, he failed to convince his fellow evolutionists of his views on spirituality (who were appalled).

That did not stop Wallace from continuing to contribute a wealth of scientific papers and books, diversifying into other fields beyond natural history or biology. He wrote about geodesy, on glacial features, on museum organisation as well as, for the first time, on politics. His best known works are still referred to today: *The Geographical Distribution of Animals* (1876), *Tropical Nature* (1878) and *Island Life* (1880). He began to devote more attention to social issues, including tracts against government aid to science, on the Church of England, on the principles of free trade, on the abolishment of trusts, and on land reform.

Wallace was invited to give a series of lectures in the United States and Canada in 1886 and 1887. This proved to be a highly successful tour, which gave him the opportunity not only to meet a great many people (including President Cleveland), but also to travel and see much of Nature as well. The tour proved important in one more respect: it inspired Wallace to write the highly successful book *Darwinism*.

Honours started to flow, with medals and honorary doctorates aplenty, even if he was rather reluctant to accept them. Around 1900, he had become Britain's best-known naturalist.

Alfred Russel Wallace died at home surrounded by his family on 7th November, 1913, aged 91.

Let me conclude by expressing the hope that you will take the few imperfectly drawn miniatures I have just presented to you as an invitation to find out more about this man. And may I suggest you turn to his own writings, his books, his letters, and his autobiography as they are a delight to read. I certainly enjoyed getting to know this remarkable man and I hope you will too.

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