

Alfred Russel Wallace

An Appreciation

By David Attenborough

This young man didn't have much going for him, really.

Born in 1823, he's twenty-five in this picture [at right]: slim and a little over six feet tall. You might guess from his clothes that he's not very well off, and you'd be right. His father had a small income, but he was a fairly idle man who didn't look after his children, and this gangly youth was the eighth out of nine.

His name was Alfred Russel Wallace.

He was born in a small town in Wales, and soon after, the family moved to the village of Hertford, just north of London. He left school when he was fourteen to work as a carpenter for one of his brothers and then as a land surveyor for another. During that time he read widely and voraciously and began to take a naturalist's interest in the countryside, particularly in the wildflowers. It was the start of studies and thoughts that would eventually make him one of the greatest naturalists that the world has ever seen.

In 1844 he moved to Leicester to work as a teacher. There he met another young budding naturalist called Henry Bates, who shared his passion for the natural world. Bates was an avid beetle collector, who collected a thousand species of beetles within ten miles of the city. What possible reason, both wondered, could there be for so many kinds of beetles? (Fifteen years earlier, another young British beetle collector—Charles Darwin—had also been fascinated by the same conundrum.)

Wallace and Bates began to dream of pursuing their interests into the tropics, where nature was most glo-



Alfred Russel Wallace in 1848, age twenty-five, just before he left for the tropics of Amazonia

rious and most varied. Why not go to the Amazon and pay for their expedition by collecting specimens of birds and insects and selling them through a London agent? That was a real commercial possibility, for there was a flourishing market in Victorian England in natural history curiosities. So off they went.

After exploring and collecting along the Amazon together for a while, they split up. For the next four years Wallace continued by himself along the Rio Negro. He lived rough. He endured recurrent bouts of malaria. But he worked with extraordinary intensity, not only collecting the specimens on which he depended for his livelihood, but also

making detailed scientific notes of his observations and speculations. After four years of hard work, he decided to return to Britain. He had found many new species that would sell well to collectors, and he had innumerable field notes, maps, diagrams, and species lists, which would be of great value to scientists. So he set off from the east coast of Brazil for Britain.

Three weeks out, the ship caught fire. Almost all Wallace's notes and specimens were lost in the flames, together with a small menagerie of live monkeys and birds that he was bringing back to impress scientists in London. For ten days he drifted in the Atlantic in a lifeboat until eventually he and his shipmates were rescued off Bermuda.

You might think that after his harrowing experiences as a traveling naturalist, once he got back home safely he would say, "Well, that's enough of that." But next, at age thirty-one, he set out by himself to try his luck in the Far East, funded in part by the insurance money

from his incinerated collection. Among other quests for rare and near-legendary animals, such as the orangutan, he wanted to see and collect birds of paradise. He had long been fascinated by these glamorous, romantic birds—and their spectacular, wonderfully colored plumes would fetch premium prices.

Birds of paradise had been haunting the European imagination for hundreds of years. The first skins arrived there in 1522, brought back from Magellan's circumnavigation of the world. They were very strange. Gauzy golden plumes, unlike any feathers that anyone had seen before, sprouted from their flanks, and they had neither feet nor wings. Magellan's men had been given them in the Spice Islands, the Indonesian islands known today as the Maluku. They had been brought there from farther east by traders from New Guinea and other islands. The hunters who had caught the birds had removed the wings and feet in order to emphasize the glory of the flank plumes. The Malukans, however, who had never seen the birds alive, maintained that the wings and feet were missing because the birds never needed such things. Their home was high in the sky where they floated in paradise, and people only found them when they died and fell to Earth. Magellan's men repeated these stories, and European naturalists believed them.

By the nineteenth century, of course, neither Wallace nor any other European naturalist accepted such preposterous tales. But only one, a Frenchman, had ever seen the living birds in the wild, and none had seen them flaunting their fantastic plumes in display. Wallace became obsessed with tracking them down. One fateful day in 1857, in the Aru Islands off New Guinea, a group of tribal hunters led him to a tall tree in the forest where the birds were known to perform their courtship displays all year round. Wallace drank in the scene as his reward for years of struggle and deprivation



In an engraving from Wallace's *The Malay Archipelago* (1869), Aru islanders use blunt-tipped arrows to bring down greater birds of paradise without causing visible wounds.

and later described it in his 1869 book, *The Malay Archipelago: Land of the Orangutan, and the Bird of Paradise*:

On one of these trees a dozen or twenty full-plumaged male birds assemble together, raise up their wings, stretch out their necks, and elevate their exquisite plumes, keeping them in a continual vibration. Between whiles they fly across from branch to branch in great excitement, so that the whole tree is filled with waving plumes in every variety of attitude and motion. . . . The Bird of Paradise really deserves its name, and must be ranked as one of the most beautiful and most wonderful of living things.

I read this passage in Wallace's book as a boy, and yearned to go out and see such a scene for myself. There are some forty-odd species in the family Paradisaeidae, and they are so extraordinarily varied that it is difficult indeed to believe that all belong to the same family. Some are as big as crows, others as small as thrushes. I first tried to film them back in 1955. We got

some shots of Count Raggi's bird of paradise, a species closely related to the greater bird of paradise, the species that Wallace had seen. But they were barely usable. The bird was perched on a branch, silhouetted against the sky. It was very early in the morning. And we only had black-and-white film. In later years I did better and eventually produced a film featuring a dozen different species in display. But then, in an extraordinary series of eighteen expeditions over eight years, Edwin Scholes and Tim Laman succeeded in recording every species of the family in magnificent detail. A sample of their work appears in this special Wallace issue of *Natural History* [see page 24].

It was while Wallace was pursuing birds of paradise, back in 1858, that he had an idea that was to bring him immortality. He was living in the jungle in a small, cramped hut when he came down with a bout of malaria or dengue fever. As he lay in his hammock in a high delirium, the question that had first occurred to him years

before, with his friend Bates, rolled around in his mind. Why are there so many different kinds of beetles, so many different kinds of birds of paradise, and so many different kinds of butterflies? And the answer came to him. Animals produce many more young than survive. Only some will live long enough to reproduce. Most will die without leaving offspring. If conditions change, either because the species moves to a new environment or because the environment changes, then the species itself will change over time. And he promptly summarized his thoughts in an essay on the theory of evolution by natural selection, as it came to be called.

He sent it to Charles Darwin, with whom he had been in intermittent correspondence and whom he admired for his travel book about the voyage of HMS *Beagle*. The letter eventually arrived in Darwin's comfortable home in Kent, in the English countryside. A greater contrast to that little hut in the Spice Islands you could hardly imagine!

Wallace's letter and essay was, to Darwin, a bombshell. He himself had envisioned species forming and transmuting by natural selection nearly twenty years earlier. Since then he had steadily accumulated a mountain of evidence to support his theory. He didn't want to be scooped, but neither did he want people to think he had stolen his ideas from Wallace. What to do?

His friends Joseph Hooker of the Royal Botanic Garden at Kew and Charles Lyell, the geologist, came up with a solution to this problem. They decided to take Wallace's essay—it was not long but it was very detailed and very convincing—and put it together with some drafts Darwin had written several years earlier. In 1858 both papers were read at the same meeting of the Linnean Society. Neither Darwin nor Wallace could be there—Darwin because his young son had just died, and Wallace because he was far away in the Maluku. They were both given credit as co-authors of the theory.

Wallace, continued to travel through the Indonesian islands adding to his collections. Only those who have trekked through dense rainforests and sailed through tropical archipelagos in rickety little boats can visualize the sort of things Wallace had to do. Col-



*Curl-crested toucans, drawn by the screams of one he has wounded, mob Henry Walter Bates, Wallace's collecting partner in Amazonia. The illustration is from Bates's *The Naturalist on the River Amazons* (1863).*

lecting and preparing his specimens, was arduous work. The skins and the feathers had to be carefully preserved intact—an extraordinarily difficult task. Pinning all his butterflies was a huge undertaking, even aided by his young assistants. Wallace made sixty to seventy separate journeys in local boats. He was sick with malaria many times. After eight years in the Malay Archipelago, he was a tired man; the time had come to go home.

Wallace had managed to collect 110,000 insects, 7,500 mollusk shells, 8,050 bird skins, and 420 mammal and reptile specimens. He had observed five different species of birds of paradise, and discovered a new member of the family that was to be named after him: Wallace's standardwing. And because in his travels among the islands he had kept such accu-

rate notes and observations about everything he saw, he was able to form a picture in his mind of the distribution of all these different animals. As early as 1856 he realized that there was an invisible line running roughly north and south across the middle of the Indonesian archipelago. On the eastern side, there were kangaroos and opossums. Among the birds there were honeyeaters and mound-building birds called megapodes. And there were eucalyptus trees. In Java and Borneo, however, on the west side, there weren't any marsupials. Instead, there were placental mammals like monkeys and tigers and elephants and deer. Nor were there any eucalyptus trees. In 1858 he wrote to his friend Bates, with whom he conducted a regular correspondence:

In this archipelago there are two distinct faunas rigidly circumscribed, which differ as much as do those of Africa and South America, and more than those of Europe and North America, yet there is nothing on the map or on the face of the islands to mark their limits. . . . I believe the western part to be a separated portion of continental Asia, while the eastern is a fragmentary prolongation of a former west Pacific continent.

With that observation he founded the science of biogeography. A century later, the division was found to be due to the way tectonic plates and continents drift across the surface of our planet. The animals of Australia developed in isolation, and part of their homeland had

slowly drifted westwards and collided with the Asiatic plate. I've crossed that line many times, and on the surface there is nothing to suggest such a division. But one morning you wake up and you can listen to birds you've been hearing all over Java and then suddenly you hear a screech of a cockatoo, and you know that you've crossed Wallace's Line.

Meanwhile Darwin rushed to write the extended explanation of the theory of natural selection that he had been planning ever since he had written the first short essay summarizing his idea. He completed it in thirteen months, and it was published on the 24th of November 1859—its full title: *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. It caused a sensation. There were angry, vigorous debates, and the church was up in arms.

Wallace got back to Britain three years later, in 1862, and at last met Darwin. You might have thought there was embarrassment or perhaps hostility or resentment one way or another. Not at all. The two men had great respect for each other, untinged by any sign of jealousy. Darwin wrote to Wallace, "You would, if you had had my leisure done the work just as well, perhaps better, than I have done it." Wallace on the other hand wrote to Bates, "I do honestly believe that with however much patience I had worked up & experimented on the subject I could never have *approached* the completeness of his book,—its vast accumulation of evidence,—its overwhelming argument, & its admirable tone & spirit. I really feel thankful that it has not been left to me to give the theory to the public."

It mustn't be supposed, however, that he necessarily agreed with everything that Darwin said. Paradoxically, one of the great areas where they disagreed with each other was about birds of paradise. Darwin, who had never seen a living bird of paradise, sat in his house in Kent, thinking about them, and he came to the conclusion that the females were capable of assessing the quality of beauty—and that the reason the males had these magnificent plumes was to *impress potential mates*. Wallace refused to believe that birds would have aesthetic sense and rejected Darwin's notion of sexual selection. Today, experimental work and much more detailed observations have shown that Darwin was correct on this question, and Wallace was wrong.

Wallace was properly honored in his country: the Royal Geographical Society and the Royal Society awarded him their medals. Yet, despite its proper name as the Darwin-Wallace theory, evolution by natural selection became popularly known as "Darwin's theory." Wallace even facilitated his own eclipse by calling his 1889 book on evolution *Darwinism*. Remarkably, scholars searching through all the books and all the correspondence haven't been able to find one word of resentment on Wallace's

part. After Darwin's death in 1882, he became the grand old man of natural history. He never was afraid of taking up a theory or indeed an issue simply because it was unpopular, if he thought it was right. He advocated radical views about feminism and the right of women to vote. He dabbled in spiritualism.

A little more than a hundred years ago, in 1913, Wallace died at the age of ninety. He was in my estimation a great man on a number of counts. First of all he was a great field naturalist. Few who have never tackled that sort of job can ever realize how daunting, how wearying, how demanding that is, and to do it for eight years in the most extreme conditions is extraordinary.

He was also a great scientific thinker. His recognition of the Line that was given his name and his associated theories about biogeography would have been sufficient to establish his reputation, even if he had not independently put forward the theory of evolution by natural selection—the foundation of all biological sciences ever since, without which the natural world makes no sense whatever. He came to it later than Darwin, but they gave it to the world together in 1858.

But above all, perhaps, I respect Wallace because of the humility, the generosity of spirit, the bravery, the endurance, and independence of mind he displayed, and the charity and good manners with which he dealt with everybody he met—whether they were tribesmen in the Aru Islands or gentlemen in Victorian England.

In my estimation he was a very, very great man.



JOHN STILLWELL/PRESS ASSOCIATION IMAGES

As befits his role as president of Butterfly Conservation, a British organization, **David Attenborough** is pictured here with a Southeast Asian great Mormon butterfly, attracted to his nose by a generous daubing of banana. Attenborough is the celebrated television naturalist whose series include *Life on Earth*, *The Living Planet*, *The Trials of Life*, *The Life of Birds*, *The Life of Mammals*, *Life in the Undergrowth*, and *Life in Cold Blood*. His documentary work allowed him to fulfill his boyhood ambition to follow in Wallace's footsteps to observe birds of paradise in the wild, and his most recent book, coauthored with Errol Fuller, is *Drawn from Paradise: The Natural History, Art and Discovery of the Birds of Paradise* (Harper Design, 2012). Attenborough is also founder of the Attenborough Nature Reserve, owned and managed by the Nottinghamshire Wildlife Trust to promote the conservation of native species. Among his many awards and honors, Attenborough was knighted in 1985.