

Contents

Alfred Russel Wallace, an Introduction and an Appreciation by Sir David Attenborough	8
Prologue: “Lonely Rambles on the Moors”	12
Where Do Species Come From?	13

Voyage to the Amazon

Young Man With a Plan	14
MAP: Journey on the Amazon and Rio Negro	15
Expectations of Paradise	16
My Tropical Delusion	17
The Forest, “Magnificent and Sublime”	18
From Para to Santarem (“We Are in Brazil”), by Herbert Wallace, 1849, Brazil	24
Tropical Sunrises	26
Spectacular Amazon Butterflies	28
Alligators and Caimans	35
Birds, Birds, Birds!	37
Mobbed by Curl-crested Toucans	46
The Umbrellabird	47
Encountering a Black Jaguar	48
Giant Anteater	49
Independent of the Earth	50
Navigating Nature’s Supermarkets	53
Impressions of the “Indians”	54
“I’d be an Indian” (poem: “A Description of Javita,” March 1851)	55
On Slavery	56
The Native Problem?	57
How Monkey Populations Diverge	60
An Amazonian Sunset	62
Thoughts of Home	63
“I’m Afraid the Ship’s on Fire”	64

The Loss of the Helen (poem)	65
Shipwreck	66
My Precious Collections Incinerated	68
Scant Salvage	69

Voyage to the Malay Archipelago

“The Central and Controlling Incident of My Life”	70
MAP: Journeys in Malay Archipelago	72
Collecting in Singapore	74
Spiders: “Often Perfect Gems of Beauty”	77
Colors of Tropical Insects	80
Wallace’s Flying Frog	83
Airborne Adversaries	84
Reptilia Tropicana	86
Hornbills	90
Monkeys of the Archipelago: “Exuberant Vitality of the Tropics”	94
Orangutan or Mias	101
On Parenting an Infant Orang	104
Durians Can Fill You or Kill You	108
The Dyaks	109
The Sarawak Law (1855)	110
“Give Us Facts, Not Theories”	111
“Wonderful Variety and Beauty”/“On Observing Nature”/“So Many Wonders Still Unknown”	112
Is Bug-Collecting a Trivial Pursuit?/ A Mere “Enthusiast”	114
Animals’ Boundaries	115
Mapping Lost Worlds	116
Same Species, Different Climates	117
Amok: From Sulawesi to Lombok	118
How Lombok Islanders Make Rifles	119

A Collector's Credo	120
Discovering Wallace's Line (1857)	121
Dobo: A Trading Village	122
Paradise Hunters Sought	124
Birdskin Burglars of Aru	125
Heavenly Bodies (Birds-of-Paradise)	127
Why Such Glorious Plumage?	128
An Eye for Beauty?	134
A Philosophy of Birds' Nests	138
Dressed to Kill	144
Hidden Treasures	146
Birds-of-Paradise Lost (Aru)	148
Pirates and Profits in Paradise	149
Ali (c. 1840–?)	150
Long Live the King (Aru, 1857)	151
Coral Sea Fantasia	153
Ternate Island	158
A Flash of Insight: Evolution by Natural Selection (1858)	162
The Joint Publication (July 1 st , 1858)	164
Recognition by "Eminent Men"	168
A Favored Party	169
Evolution Brings Order to Chaos	170
On Adaptation	172
A Thrilling Capture: Golden Birdwing Butterfly	174
Unexpected Prize: The Elusive Standardwing Bird-of-Paradise	176
Maleo's Egg-Laying Marathon	178
Semi-Aquatic Peoples	180
Way To Waigeo: "My First (and Last) Voyage in a Boat of My Own"	185
Bower Birds	186

Java	188
Then and Now—Images From the 1860s and Today	190

Return to England

Live Birds-of-Paradise in London	192
Treasures from the Tropics	194
Relationship with Charles Darwin	196
On Conventional Religious Belief	198
Parting Company on the Human Brain ..	199
Spiritualism	200
How "Darwin's Bulldog" Thomas Huxley Saved Wallace's Pension	202
North American Lecture Tour	203
California's Glorious Giant Trees	204
On the Canals of Mars: Wallace vs. Lowell	206
On Eugenics	208
Women's Role in Human Selection	209
Pollution and Destruction	211
Cosmic Grades of Power	212
Harnessing Atomic Energy	213
Birth Pangs of Truth/ Originality of Ideas	215
Five Magic Moments	217
"They All Come to Life Again!"	218
"An Ever-Increasing Rapture!"	219
A Parting Reflection	220
Authors	222
Acknowledgments and Dedication	223

Gursky's Spectral Tarsier (*Tarsius spectrumgurskyae*).
Tangkoko Nature Reserve, Sulawesi. © George Beccaloni



Alfred Russel Wallace, an Introduction and an Appreciation

by Sir David Attenborough

This young man didn't have much going for him, really. Born in 1823, he's twenty-four in this picture [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 eventually 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.)



A colorized daguerreotype of Alfred Russel Wallace in 1847, aged twenty-four, the year before he left for the Amazon rainforest.
© George Beccaloni

Wallace and Bates began to dream of pursuing their interests into the tropics, where nature was most glorious 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, known today as the Indonesian islands of 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 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 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.

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



In *The Malay Archipelago* (1869), Wallace recounts lying on his couch when he noticed a giant python coiled above him in the roof of his hut. The illustration depicts Wallace (right, with rifle) and his assistants evicting the intruder. Public domain

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, and 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 Islands. They were both given credit as coauthors 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. Collecting 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 eventually named after him: Wallace's standardwing. And because in traversing seas through which he had been traveling he had kept such accurate 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 still 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 westward 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 the other. 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 one another concerned birds-of-paradise. Darwin, who had never seen a living bird-of-paradise, sat in his house in Kent, thinking about them and other birds, such as pheasants, the males of which alone develop a special breeding plumage. He came to the conclusion that the function of the males' spectacular feathers was to impress the females with their color and shape and that therefore the females were capable of assessing what we would call beauty. Wallace refused to believe that birds had an aesthetic sense and rejected this 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



This frontispiece illustration from Wallace's classic of science and exploration, *The Malay Archipelago*, depicts the bloody battle when Bornean Dyak tribesmen attacked a male orangutan.

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.

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 reputa-

tion, 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.



Prologue: “Lonely Rambles on the Moors”

[Wallace’s interest in natural history began in 1841 while working as an apprentice to his older brother William near Neath, Wales. During that period they spent much time in the countryside pursuing work as land surveyors.—Ed.]

During the larger portion of my residence at Neath we had very little to do, and my brother was often away...*[doing surveying jobs]* in various parts of the country. I was thus left a good deal to my own devices...*[W]*hat occupied me chiefly and became more and more the solace and delight of my lonely rambles among the moors and mountains, was my first introduction to the variety, the beauty, and the mystery of nature as manifested in the vegetable kingdom...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...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.

—Wallace, A. R. 1905. *My Life: A Record of Events and Opinions*. Vol. 1. London: Chapman & Hall. [pp. 191–192; 195]



Above: Young Wallace regularly took long, solo hikes on the vast moors near his home in Neath, Wales, like these in the Brecon Beacons National Park. © Stephen Davies/Alamy Above: Wallace in 1853. © Wallace Memorial Fund

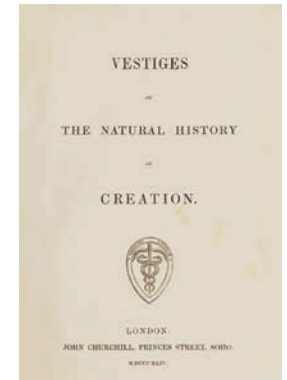
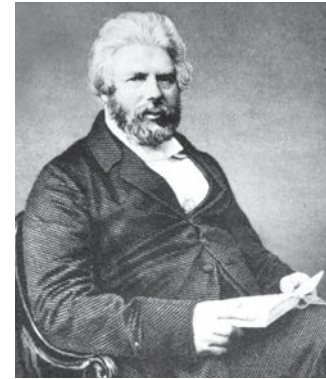
Where Do Species Come From?

I have rather a more favorable [*sic*] opinion of the “Vestiges” [*Robert Chambers’ 1844 book Vestiges of the Natural History of Creation*] than you appear to have I do not consider it [*transmutation of species*, i.e. *evolution*] as a hasty generalisation, but rather as an ingenious hypothesis strongly supported by some striking facts and analogies but which remains to be proved by more facts and the additional light [of more research]...It...furnishes a subject for every observer of nature to turn his attention to; every fact he observes must make either for or against it, and it thus furnishes both an incitement to the collection of facts and an object to which to apply them when collected.

—Wallace, A. R. 1845. [WCP346.346. Letter from ARW, Neath, Wales, 28 December 1845, to his friend and original partner in the exploration of the South American rainforests Henry Walter Bates] Epsilon: The Alfred Russel Wallace Collection.

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 [the] opinion that some definite results might be arrived at.

—Wallace, A. R. 1847. [WCP348.348. Letter from ARW, Neath, Wales, 11 October 1847, to Henry Walter Bates] Epsilon: The Alfred Russel Wallace Collection.



Above: Fifteen years before Charles Darwin's *Origin of Species* (1859) appeared, Scots author Robert Chambers anonymously published his controversial *Vestiges of the Natural History of Creation* (1844), which theorized that, contrary to religious Scripture, species evolved gradually over time. Below: Young Wallace, inspired by his friend Henry Walter Bates, became an avid beetle collector. Their astonishing diversity made the budding naturalists ponder why and how such an abundance of closely related species had come about. Photo: © H. Zell, Staatliches Museum für Naturkunde, Karlsruhe, Germany (Wikimedia).



VOYAGE to the AMAZON

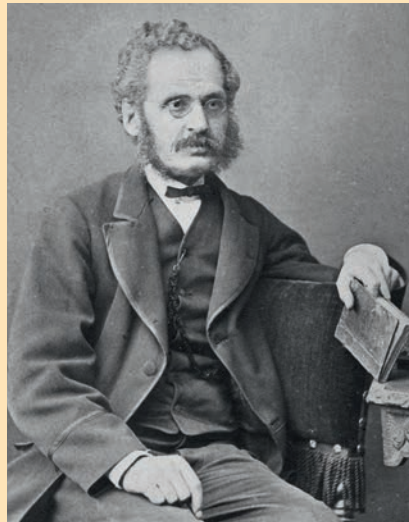
Young Man With a Plan

In the autumn of 1847 Mr. A. R. Wallace, who has since acquired wide fame in connection with the Darwinian theory of Natural Selection, proposed to me a joint expedition to the river Amazons, for the purpose of exploring the Natural History of its banks; the plan being to make for ourselves a collection of objects, dispose of the duplicates in London to pay expenses, and gather facts, as Mr. Wallace expressed it in one of his letters, ‘*towards solving the problem of the origin of species*,’ [emphasis added] a subject on which we had conversed and corresponded much together.

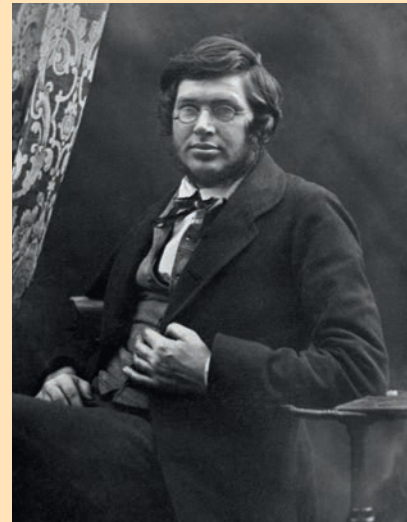
—Bates. Henry W. 1863. Preface to first edition of *The Naturalist on the River Amazons*.

I begin to feel rather dissatisfied with a mere local collection—little is to be learnt by it.. I sh[oul]d 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 [the] opinion that some definite results might be arrived at....

—Wallace, A. R. 1847. Letter to H. W. Bates 11 October 1847.



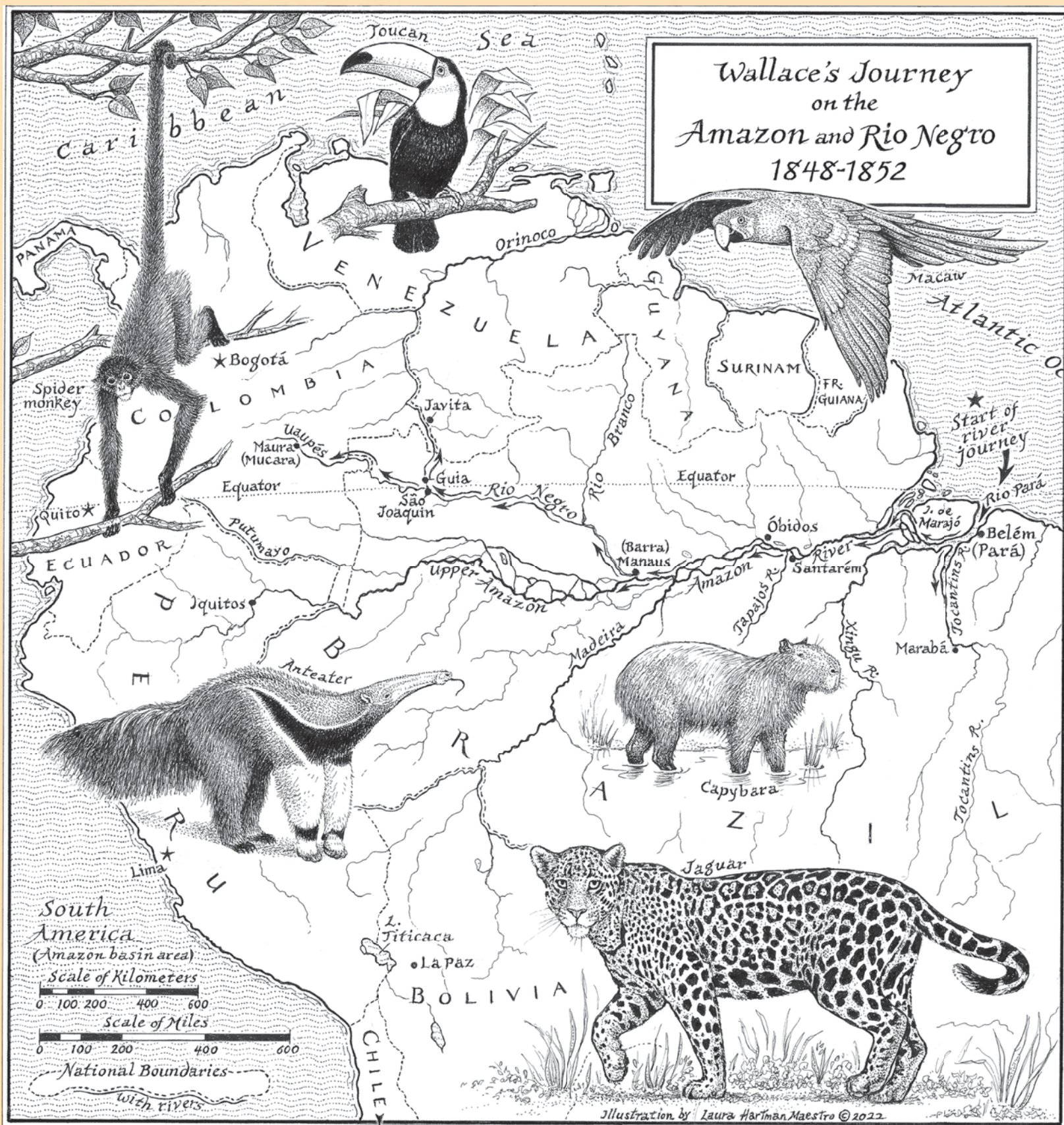
Young Henry Walter Bates (c.1865), left, (©Welcome.com) and Wallace, right (© Wallace Memorial Fund). Both amateur naturalists boldly decided to explore the vast, unknown Amazon rainforests when Wallace was 25 years old and Bates was 23.



These extracts from my early letters to [Henry Walter] Bates suffice to show that the great problem of the origin of species was already distinctly formulated in my mind; that I was not satisfied with the more or less vague solutions at that time offered; that I believed the conception of evolution through natural law so clearly formulated in the “*Vestiges*” [Vestiges of the Natural History of Creation, by Robert Chambers, 1844] to be, so far as it went, a true one; and that I firmly believed that a full

and careful study of the facts of nature would ultimately lead to a solution of the mystery.

—Wallace, A. R. 1905. *My Life: A Record of Events and Opinions*. Vol. 1. London: Chapman & Hall. [p. 257]



Expectations of Paradise

[In his autobiography My Life, Wallace recalled that vivid descriptions in William Edwards' 1847 book A Voyage Up the River Amazon inspired him and Henry Walter Bates to embark on their epic odyssey through the tropical rainforests. —Ed.]

...[V]ast numbers of trees add their tribute of beauty, and the flower-domed forest, from its many coloured altars, ever sends

heavenward worshipful incense. Nor is this wild luxuriance unseen or unenlivened. Monkeys are frolicking through festooned bowers, or chasing in revelry over the wood arches. Squirrels scamper in ecstasy from limb to limb, unable to contain themselves for joyousness...Birds of gaudiest plumage, flit through the trees.

—Edwards, W. H. 1847. *A Voyage up the River Amazon, Including a Residence at Pará*. New York: Appleton & Co. [p. 45]



"A Brazilian Forest with Characteristic Mammalia" from Wallace's 1876 book *The Geographical Distribution of Animals*, Vol. 2: p. 124. Public domain



Rainforest, Yasuni National Park, Ecuador. ©Tim Laman

My Tropical Delusion

...I had read many books of travels in hot countries, I had dwelt so much on the enthusiastic descriptions most naturalists give of the surpassing beauty of tropical vegetation, and of the strange forms and brilliant colours of the animal world, that I had wrought myself up to a fever-heat of expectation, and it is not to be wondered at that my early impressions were those of disappointment. On my first walk into the forest I looked about, expecting to see monkeys as plentiful as at the Zoological Gardens, with humming-birds and parrots in profusion. But for several days I did not see a single monkey, and hardly a bird of any kind, and I began to think that these and other productions of the South American forests are much scarcer than they are represented to be by travellers. But I soon found that these creatures were plentiful enough when I knew

where and how to look for them, and that the number of different kinds of all the groups of animals is wonderfully great...[I]n a single walk you may sometimes see more quadrupeds, birds, and even some groups of insects in England than here. But when seeking after them day after day, the immense variety of strange forms and beautiful colours is really astonishing. There are, for instance, few places in England where during one summer more than thirty different kinds of butterflies can be collected; but here, in about two months, we obtained more than four hundred distinct species, many of extraordinary size, or of the most brilliant colours.

—Wallace, A. R. 1905. *My Life: A Record of Events and Opinions*. Vol. 1. London: Chapman & Hall. [pp. 269–273]

The Forest, “Magnificent and Sublime”

...[N]o one who has any feeling of the magnificent and the sublime can be disappointed; the sombre shade, scarce illumined by a single direct ray even of the tropical sun, the enormous size and height of the trees, most of which rise like huge columns a hundred feet or more without throwing out a single branch, the strange buttresses around the base of some, the spiny or furrowed stems of others, the curious and even extraordinary creepers and climbers which wind around them, hanging in long festoons from branch to branch, sometimes curling and twisting on the ground like great serpents, then mounting to the very tops of the trees, thence throwing down roots and fibres which hang waving in the air, or twisting round each other form ropes and cables of every variety of size and often of the most perfect regularity...the parasitic plants growing on the trunks and branches, the wonderful variety of the foliage, the strange fruits and seeds that lie rotting on the ground—taken altogether surpass description, and produce feelings in the beholder of admiration and awe. It is here, too, that the rarest birds, the most lovely insects, and the most interesting mammals and reptiles are to be found. Here lurk the jaguar and the boa-constrictor, and here amid the densest shade the bell-bird tolls his peal.¹

...[T]he virgin forest, everywhere grand, often beautiful and even sublime. Its wonderful variety with a more general uniformity never palled. Standing under one of its great buttressed trees—itself a marvel of nature—and looking carefully around, noting the various columnar trunks rising like lofty pillars, one soon perceives that hardly two of these are alike. The shape of the trunks, their colour and texture, the nature of their bark, their mode of branching and the character of the foliage far overhead, or of the fruits or flowers lying on the ground,

Aerial view of morning mist above the Tiputini River in Yasuni National Park, eastern Ecuador. © Tim Laman









Opposite page: Strangler Fig (*Ficus sp.*) roots surround a host tree trunk. Gunung Palung National Park, West Kalimantan, Borneo. © Tim Laman
Above: A lowland rainforest tree with large plank buttresses at the Tiputini Biodiversity Station, Orellana Province, Ecuadorian Amazon. © Tim Laman

have an individuality which shows that they are all distinct species differing from one another as our oak, elm, beech, ash, lime, and sycamore differ. This extraordinary variety of the species is a general though not universal characteristic of tropical forests, but seems to be nowhere so marked a feature as in the great forest regions which encircle the globe for a few degrees on each side of the equator. An equatorial forest is a kind of natural arboretum where specimens of an immense number of species are brought together by nature...

The second feature, that I can never think of without delight, is the wonderful variety and exquisite beauty of the butterflies and birds, a variety and charm which grow upon one month after month and year after year, as ever new and beautiful, strange and even mysterious, forms are continually met with. Even now I can hardly recall them without a thrill of admiration and wonder.²

—Wallace, A. R. 1905. *My Life: A Record of Events and Opinions*. Vol. 1. London: Chapman & Hall. [pp. 270–271¹, 287–288²]

Right: Red Howler Monkey (*Alouatta seniculus*) the world's loudest land mammal, whose prolonged territorial roars can be heard from three miles away. Tiputini Biodiversity Station, Orellana Province, Ecuador. © Tim Laman
Below: Giant River Otters (*Pteronura brasiliensis*) Cunning, coordinated pack hunting strategies in the water make them the only predators besides jaguars that can prey on large Black Caimans. Anangu creek, Yasuni National Park, Ecuador. © Tim Laman

