

Wallace's Line

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Introduction

In the mid-eighteen hundreds, professor T. H. Huxley wrote of Alfred Russel Wallace, "Once in a lifetime, a Wallace may be found, physically, mentally, and morally qualified to wander unscathed through the tropical wild of America and Asia; to form magnificent collections as he wanders; and withal to think out sagaciously the conclusion suggested by his collections: but, to the ordinary explorer or collector, the dense forest of equatorial Asia and Africa, which constitute the favorite habitation of the orang, the chimpanzee, and the gorilla, present difficulties of no ordinary magnitude: and the man who risks his life by even a short visit to the malarious shores of those regions may well be excused if he shrinks from facing the dangers of the interior; if he contents himself with stimulating the industry of the better seasoned natives, and collecting and collating the more or less mythical reports and traditions with which they are too ready to supply him."

Alfred R. Wallace was a self-taught naturalist who spent four years collecting and studying the plant and animal life of the Amazon Basin and another eight years in the Malay Archipelago. On the basis of his observations he formulated his own theory of natural selection and sent an outline to Charles Darwin which then pushed Darwin into publishing his *Origin of Species* in 1859. Both men had come to the same conclusion as to evolution of the species, but Charles Darwin will be forever known as the creator of this theory.

During the eight years from 1854 to 1862, Alfred Wallace traveled fourteen hundred miles among hundreds of islands in the Malay Archipelago. They included two of the largest, New Guinea and Borneo down to some of the smallest islets.

Wallace was a collector, but more than that he was an astute field observer and he tried to understand the how and why this new environment



worked. He had a great opportunity to observe products of nature in their own surroundings that had been little touched by man. He could observe this earth with its own adaptations and adjustments, each plant and animal having its life enriched or destroyed on its own, not by the influence of man.

A Fantastic Discovery

Wallace spent his first two years in Singapore and around Sarawak, Borneo. It was after this time of apprentice that he decided to move onto other islands. He wanted to first investigate Makassar, Celebes (present day Sulawesi). But travel was very slow and inconvenient in those days and Wallace could not find passage directly from Singapore to Makassar. So he booked passage on a schooner sailing to Buleleng on the north side of Bali. Here Wallace spent several days observing the bird and insect life of Bali. He was delighted with what he saw and he shot and preserved specimens of wagtailed thrush, an oriole, and some starlings. He also collected some beautiful black and orange (on a white background) butterflies that were abundant on a country lane. All of the wildlife he observed on the isle of Bali was similar to the wildlife found on the large island of Java that was directly west of Bali.

A few days later he booked passage

to Ampenan in the island of Lombok. Leaving Buleleng in Bali, it took only a two-day passage to arrive in Ampenan, Lombok, for it was less than 20 miles between islands. Wallace spent three months on the island of Lombok and naturally expected to see the same plant and animal life he had observed in Bali. The climate and terrain were very similar between these two islands but to Wallace's astonishment he found a totally different set of species, most of which were utterly unknown not only in Java, but in Borneo, Sumatra and Malacca. For instance, white cockatoos were very common in Lombok along with three species of Meliphagidae, or honeycreepers, belonging to family groups that are entirely absent from the western or Indo-Malayan region of the archipelago. As one continues eastward to Flores and Timor, Wallace found that the distinctness from the Javanese species was even more noticeable. The species here were similar to those of New Guinea and Australia.

Of interest, in 1845, almost 10 years before Wallace landed in the Malay Archipelago, it was written (by George Windsor Earl) that there was a shallow sea that connected the great islands of Sumatra, Java and Borneo to the Asiatic continent. It was also agreed that there was a similar shallow sea connecting New Guinea and some of the island

adjacent to Australia, all being characterized by the presence of marsupials.

The Wallace's Line

It was this comparison that caused Wallace to recognize the most radical contrast in the Archipelago. He followed it out in detail and drew a line among the islands so as to divide them into halves, the western islands belonging to Asia and the eastern islands being allied to Australia. The terms that Wallace gave these areas were the Indo-Malayan division to the west (Asia) and the Austro-Malayan division to the east (Australia). The term "Wallace's Line" did not come from Wallace himself but was given by T. H. Huxley in honor of Wallace's unexpected discovery. The animals and insects on the western islands resembled those of Asia, while the animals of the eastern islands resembled those of Australia. The middle islands had mixtures of representatives of both continents.

The islands east of the Wallace's Line have a distinct flora and fauna with a close resemblance to that found in Australia. Australia is well-known for its unique fauna that differs from all other continents; it possesses no monkeys or apes, no cats or tigers, wolves, bears, hyenas, no deer or antelopes, sheep or oxen, no elephant, horse, squirrel or rabbit – none of those types of animals found throughout the rest of the world. Indeed, Australia is full of marsupials (kangaroos, opossums, wombats, and the Duck-billed Platypus). Its birds are also almost as peculiar. There are no woodpeckers or pheasants to be found, but in their replacement are the mound-building brush-turkeys, honeysuckers, cockatoos, and the brush-tongued lorries. These unique birds are not found west of the Wallace's Line.

It was surmised by Wallace that the islands west of the division between Bali and Lombok were never joined together with the islands found east of the Wallace's Line. Indeed they formed two distinct continents, one coming from the Pacific and the other being a part of the Asian continent. There was a dividing depth of water between

these two island masses. In ancient times these two continents were as divided as would be the present-day South America and Africa. As time went on with the turmoil of the continental shelves, these two continents were brought together. But instead of the huge land masses, much of the land had been changed, even to the point where much of it was under water, thus forming many islands that were in reality the tops of mountain ranges or volcanoes. This was the explanation for Wallace's great, unexpected discovery. He spent most of his waking hours of the next few years proving this theory.

Conflicting Divisions

Wallace did observe that even if there were great differences in the types of animal life found on the different areas of the Malay Archipelago, this did not correspond to the physical and climate divisions between the two. Indeed many of the islands from both sides clearly resembled each other. A great volcanic chain runs through both parts but this appears to produce no effect on their natural productions. New Guinea resembles Borneo not only in its great size but also in its absence of volcanoes. It has similar diversities in its geological structure and its uniformity in its climate, being well clothed with forested vegetation.

The islands of this archipelago range in size from two of the world's largest, Borneo and New Guinea to the very tiniest of islets. At first sight these islands appear to be similar and look to be larger or smaller versions of one another. In reality they are not all even of the same age. Some of the islands are much older than others. In the Malay Archipelago there is an indication of a long ago vast continent, with a peculiar flora and fauna having been gradually and irregularly broken up; the island Celebes probably marking its furthest westward expansion, beyond which was a wide ocean. At the same time Asia appears to have been extending its limits in a south-east direction, first in an unbroken mass, then separated into islands as we now see it, and coming into actual

contact with the scattered fragments of the great southern land.

Bali and Lombok

The islands of Bali and Lombok, situated at the east end of Java, are particularly interesting. They form the extreme points of the two great zoological divisions of the Eastern Hemisphere. They are quite similar in external appearance and physical features but differ greatly in their natural productions.

During the few days Wallace stayed on the north coast of Bali on his way to Lombok he saw several birds highly characteristic of Javan ornithology. Among them were the Yellow-headed Weaver, Black Grasshopper Thrush, Rosy Barbet, Malay Oriole, Java Ground Starling, and the Javanese Three-toed Woodpecker. Upon crossing over to Lombok, separated from Bali by a strait less than 20 miles wide, he expected to see some of the same birds again. During his three month stay there he never saw one of them but found a totally different set of species, most of which were utterly unknown not only in Java but also in Borneo, Sumatra and Malacca.

Wallace traveled to Amapanam, in the island of Lombok, where he devoted himself to collecting the birds of the neighborhood. In Wallace's words, "The fine fig-trees of the avenues, where a market was held, were tenanted by superb orioles (*Oriolus broderipii*) of a rich orange color, and peculiar to this island and the adjacent ones of Sumbawa and Flores. All round the town were abundance of the curious *Tropidorhynchus timoriensis*, allied to the Friar bird of Australia. They are here called "Quaich-quaich," from their strange loud voice, which seems to repeat these words in various and not unmelodious intonations."

Labuan Tring at the southern extremity of the bay of Lombok, produced a plenitude of very interesting birds. For the first time he saw many Australian forms that were absent from the islands westward. Small white cockatoos were abundant and their loud screams, con-

spicuous white color, and pretty yellow crests rendered them a very important feature in the landscape. This is the most westerly point on the globe where any of the cockatoo family are to be found. Small honey suckers and the strange mound maker (*Megapodius gouldii*) are also found in Lombok.

Wallace also discovered the large green pigeons here to be quite plentiful and very good eating. They were larger than the largest tame pigeons and abounded on the palm trees where they ate the hard globular nuts that were at least an inch in diameter. By looking at the pigeon's head and bill it seemed impossible that it could swallow such large objects. But when he shot the birds they had several palm-fruits in their crop, which generally burst when they fell to the ground.

Beautiful grass-green doves, little crimson and black flower peckers, large black cuckoos, metallic king-crows, golden orioles and the fine jungle-cocks – the origin of all our domestic breeds of poultry – were among the birds that chiefly attracted Wallace's attention during his stay at Labuan Tring.

Ceram

Wallace's adventures in Ceram were plagued with traveling the rapid waters of many rivers and suffering the bites of acarus, an insect worse than mosquitoes, ants or any other type of pests. He was covered with lumps from their bites and had to take two months off because of the serious disease they caused him.

He said the only good bird seen in the interior valleys of Ceram was the fine Ambon lorry but they were always too high to shoot. Besides this the great Moluccan hornbill, which he didn't want, was almost the only bird he met with. He didn't see a single ground-thrush, kingfisher, or pigeon and had never been in a forest so utterly desert of animal life as this appeared to be.

Traveling on to the village of Teluti, Wallace inquired about lorries and the only kind known were the ring-necked lorry and the common red and green lorikeet, both common in

Ambon as well. Black lories and cockatoos were quite unknown here.

Moluccas

It appears that the Moluccan fauna has been almost entirely derived from that of New Guinea, in which the same deficiency and same luxuriance has been observed. Yet the immigration of the birds has not been a recent one, since there has been time for the greater portion of these species to have become changed. It is possible to divide this small archipelago into two well-marked groups – that of Ceram, including Buru, Ambon, Banda, and Ke; and that of Giolo, including Morty, Batchian, Obi, Ternate and other smaller islands.

The Moluccas are especially rich in the parrot tribe with no less than 22 species belonging to 10 genera inhabiting them. Among these is the Red-crested Cockatoo, which at that time (almost 150 years ago) was commonly seen alive in Europe, two handsome red parrots of the genus *Eclactus* and five of the beautiful crimson lories, which are almost exclusively confined to these islands and the New Guinea group.

During Wallace's travels of Giolo, or Halmahera as we know it today, he coasted along the Kaioa Islands and found many new species of insects which he happily collected. He complained that his boys were less fortunate in shooting birds. The only birds at all common were the Great Red Parrot "*Eclactus grandis*" found in most of the Moluccas, a crow, and a Megapodus or mound maker. Interesting that he used the name "Grand Eclactus," because the subspecies of *Eclactus* that hails from Halmahera is today called *Vosmaeri*.

Aru Islands


The Aru islands lie about one hundred and fifty miles to the south of New Guinea and Wallace was certain they were once connected, evidenced by the striking resemblance of their productions. He collected one hundred species of land-birds during his visit to the Aru islands and about eighty of them have also been found

on the mainland of New Guinea.

Wallace tells of the first black cockatoo he saw and what a great prize it was. He described it as having a small weak body, long weak legs, and an enormously developed head, ornamented with a magnificent crest and armed with a sharp-pointed hook bill of immense size and strength. The plumage was entirely black but had all over it the curious powdery white secretion characteristic of cockatoos.

Wallace was especially delighted to have obtained a specimen of the King Bird of Paradise. This sighting of this bird was one of his foremost goals, which inspired his travels to the far East. His excitement over the Bird of Paradise is best told in his own words:

"I knew how few Europeans had ever beheld the perfect little organism I now gazed upon, and how imperfectly it was known in Europe. The emotions excited in the mind of a naturalist who has long desired to see the actual thing which he has hitherto known only by description, drawing or badly preserved external covering – especially when that thing is of surpassing rarity and beauty – require the poetic faculty fully to express them. The remote island in which I found myself situated, in an almost unvisited sea far from the tracks of merchant fleets and navies; the wild luxuriant tropical forest which stretched far away on every side; the rude uncultured savages who gathered around me – all had their influence in determining the emotions with which I gazed upon this "thing of beauty."

The most remarkable Alfred Russel Wallace returned to England in 1862. Then, with his collections about him, he spent several years studying them and writing up his conclusions before turning to the account of his travels, which he documented in his book *Malay Archipelago*. This book written in 1869 is full of interesting observations, marvelous descriptions, and fascinating adventures. The colorful naturalist's long and fruitful life ended in 1913. Wallace was described by Lord Lister, who was dean of the Westminster Abbey, on a plaque stating that Wallace will always be ranked among the most eminent scientists of the nineteenth century. 

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