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*'The Malay Archipelago: the Land of the Orang-utan, and the Bird of Paradise. A Narrative of Travel, with Studies of Man and Nature.* By Alfred Russel Wallace. Macmillan.'

Probably no portion of the globe is so little known to educated Englishmen as the vast Archipelago situated between Asia and Australia; and, until lately, no region has been so little explored by English travellers. And yet the islands which form Malaysia yield to none others in point of interest, and more especially with regard to the striking features of their geology, physical geography, vegetation, and animal life. They produce the richest fruits and the most fragrant spices; their surfaces are covered with luxuriant forests, which teem with the strangest tropical vegetation, and the most gorgeous flowers; while among the animals of the region are the man-like orang-utan, the tree-kangaroo, the tiger, the leopard, the elephant, and rhinoceros. In New Guinea alone there are thirty species of parrots, forty of pigeons, and sixteen of kingfishers, besides the fourteen varieties of the rainbow-tinted birds of paradise; while the forests of all the islands swarm with every conceivable form of insect. Enormous beetles of extraordinary conformation, and of the most brilliant metallic lustre, abound amidst the thick underwood, while numberless gorgeously-coloured butterflies flit among the delicate ferns and gigantic orchids. The geological features of these islands are as wonderful as their widely varied flora and fauna. Sumatra, Java, Celebes, Timor, Amboyna, Bouru, and Gilolo all abound in volcanic mountains, while one of them, Java, contains more volcanoes, active and extinct, than any other portion of the globe of equal size. In this island alone there are forty-five, averaging in height 10,000 feet. In fact a most important volcanic belt passes through the Archipelago; and in the region surrounding this vast line earthquakes, eruptions, and explosions are very frequent, and destructive of life and vegetation. The Malay Archipelago extends about 4,000 miles east and west, and 1,300 north and south, and includes three islands each larger than Great Britain, three about the size of Ireland, eighteen as large as Jamaica, and more than a hundred as large as the Isle of Wight, besides islets innumerable.

Such is a geographical outline of the region whose wonders, after eight years' travelling from island to island, Mr Wallace now endeavours to bring home to his countrymen. It would be impossible in the space allotted to us to do

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adequate justice to the large amount of information, geological, geographical, ethnological, and biological, contained in these volumes. The author, too, places all this information before us in a systematic manner, and thus makes his work more valuable to the student, and more interesting to the general reader. He commences by giving an introductory chapter, setting before us a general view of the geography and geology of the Malay Archipelago, and suggests some rather startling theories with respect to the former condition of that region. He then proceeds to examine the several islands which make up the groups into which he divides the whole, and after a general account of his travels, concludes with a chapter detailing the natural history of each group. Before describing these magnificent islands of the

Eastern Seas, it will be as well to notice some recent results arrived at by scientific travellers as to the former distribution of land and water in this part of the Eastern hemisphere, and the curious contrasts of its flora and fauna. In 1845, Mr Earl, in a paper read before the Royal Geographical Society, first pointed out that “a shallow sea connected the great islands of Sumatra, Java, and Borneo with the Asiatic Continent, with which their natural productions generally agreed, while a similar shallow sea connected New Guinea and some of the adjacent islands with Australia, all being characterised by the presence of marsupials.” Now this is the clue to the contrast in this Archipelago, and throughout the work our author follows it out in detail, and brings many more facts to his assistance. He thinks that if these islands have been separated from the Continent and from each other by subsidence, the separation must be geologically recent, since the subsidence is comparatively so small. But the geology of these regions affords the most striking evidence that these great islands once formed part of the Continent:

The elephant and tapir of Sumatra and Borneo, the rhinoceros of Sumatra and the allied species of Java, the wild cattle of Borneo and the kind long supposed to be peculiar to Java, are now all known to inhabit some part or other of Southern Asia. None of these large animals could possibly have passed over the arms of the sea which now separate these countries, and their presence plainly indicates that a land communication must have existed since the origin of the species. Among the smaller mammals a considerable portion are common to each island and the continent; but the vast physical changes that must have occurred during the breaking up and subsidence of such extensive regions have led to the extinction of some in one or more of the islands, and in some cases there seems also to have been time for a change of species to have taken place. Birds and insects illustrate the same view, for every family, and almost every genus of these groups found in any of the islands, occurs also on the Asiatic continent, and in a great number of cases the species are exactly identical. Birds offer us one of the best means of determining the law of distribution; for though at first sight it would appear that the watery boundaries which keep out the land quadrupeds could be easily passed over by birds, yet practically it is not so; for if we leave out the aquatic tribes which are pre-eminently wanderers, it is found that the others (and especially the Passeres, or true perching-birds, which form the vast majority) are generally as strictly limited by straits and arms of the sea as are quadrupeds themselves. As an instance, among the islands of which I am now speaking, it is a remarkable fact that Java possesses numerous birds which never pass over to Sumatra, though they are separated by a strait only fifteen miles wide, and with islands in mid-channel. Java, in fact, possesses more birds and insects peculiar to itself than either Sumatra or Borneo, and this would indicate that it was earliest separated from the continent. Next in organic individuality is Borneo, while Sumatra is so nearly identical in all its animal forms with the peninsula of Malacca, that we may safely conclude it to have been the most recently dismembered island.

The general result, therefore, at which we arrive is, that the great islands of Java, Sumatra, and Borneo resemble, in their natural productions the adjacent parts of the continent, almost as much as such widely-separated districts could be expected to do even if they still formed a part of Asia; and this close resemblance, joined with the fact of the wide extent of sea which separates them being so uniformly and remarkably shallow, and lastly, the existence of the extensive range of volcanoes in Sumatra and Java, which have poured out vast quantities of subterranean matter, and have built up extensive plateaux and lofty mountain ranges, thus furnishing a *vera causa* for a parallel line of subsidence—all lead irresistibly to the conclusion that, at a very recent geological epoch, the continent of Asia extended far beyond its present limits in a south-easterly direction, including the islands of Java, Sumatra, and Borneo, and probably reaching as far as the present 100-fathom line of soundings.

If we now proceed further east in the Archipelago, we shall find that all the islands from Celebes eastward stand in the same relation to Australia, with regard to their flora and fauna, as the more westerly

islands do to Asia. The productions of Australia are peculiar: it possesses no monkeys, tigers, wolves, bears, deer, oxen, horses, or elephants. It has instead marsupials, kangaroos, opossums, and wombats, while in birds it has the honeysuckers, cockatoos, and the brush-tongued lorries. And these peculiar productions are also found on the islands which form, as Mr Wallace denominates it, the Austro-Malayan division of the Archipelago:

The inference that we must draw from these facts is undoubtedly, that the whole of the islands eastward beyond Java and Borneo do essentially form a part of a former Australian or Pacific continent, although some of them may never have been actually joined to it. This continent must have been broken up not only before the Western Islands were separated from Asia, but probably before the extreme south-eastern portion of Asia was raised above the waters of the ocean; for a great part of the land of Borneo and Java is known to be geologically of quite recent formation, while the very great difference of species, and in many cases of genera also, between the productions of the Eastern Malay Islands and Australia, as well as the great depth of the sea now separating them, all point to a comparatively long period of isolation.

In a similar manner Mr Wallace accounts for the distinction between the Malays and Papuans, who inhabit respectively the eastern and western halves of the Archipelago. He found the line which separates these races somewhat to the eastward of that which divides the zoological regions, and he attributes this circumstance to the maritime enterprise and higher civilisation of the Malays, which enabled them to overrun the adjacent regions.

The author's main purpose in visiting this part of the world seems to have been to study natural history and to collect specimens of all the curiosities of the tropical east. He was very successful in Borneo, Sumatra, and New Guinea, as these three islands abound in strange mammalia, birds, and insects. In Borneo Mr Wallace secured a specimen of a flying frog, "interesting to Darwinians, as showing, that the variability of the toes which have been already modified for purposes of swimming and adhesive climbing, have been taken advantage of to enable an allied species to pass through the air like a flying lizard." In Borneo, too, an infant mias, or orang-utan, was secured by the author, who endeavoured to rear it upon rice-water and sugar, as no milk was to be had. The description of the nurture and education of the baby-monkey is exceedingly interesting, and leads one to ask the question: What is the limit to the education of monkeys? Like any other baby, the mias, when laid down by itself, would invariably cry, and, unlike a human baby, when it was dirty, would cry until it was washed. Unfortunately for science, Mr Wallace's "little pet" died of intermittent fever, after having been in his possession for three months. The orang-utan of Borneo and Sumatra seems to be an almost undisputed ruler of the forests and jungle. No animals are strong enough to hurt the mias, say the Dyaks, or native hunters; he is sometimes attacked by the crocodile or python, but the former "he always kills by main strength, standing upon it, pulling open its jaws and ripping up its throat;" while the python he very soon bites to death. The mias is seldom seen on the ground; he lives almost entirely among the tree-tops of the lofty and unbroken virgin forests which cover the swampy districts of the larger islands of the East Indian Archipelago. Mr Wallace indignantly dismisses the story of the orang walking erect, unless supporting itself by its hands, by clinging to the branches above him, or when attacked by man. The representations of its walking with a stick, the author characterises as entirely imaginary:

It is a singular and very interesting sight to watch a Mias making his way leisurely through the forest. He walks deliberately along some of the larger branches, in the semi-erect attitude which the great length of his arms and the shortness of his legs cause him naturally to assume; and the disproportion between these limbs is increased by his walking on his knuckles, not on the palm of the hand, as we should do. He seems

always to choose those branches which intermingle with an adjoining tree, on approaching which he stretches out his long arms, and, seizing the opposing boughs, grasps them together with both hands, seems to try their strength, and then deliberately swings himself across to the next branch, on which he walks along as before. He never jumps or springs, or even appears to hurry himself, and yet manages to get along almost as quickly as a person can run through the forest beneath. The long and powerful arms are of the greatest use to the animal, enabling it to climb easily up the loftiest trees, to seize fruits and young leaves from slender boughs which will not bear its weight, and to gather leaves and branches with which to form its nest. I have already described how it forms a nest when wounded, but it uses a similar one to sleep on almost every night. This is placed low down, however, on a small tree not more than from twenty to fifty feet from the ground, probably because it is warmer and less exposed to wind than higher up. Each Mias is said to make a fresh one for himself every night; but I should think that is hardly probable, or their remains would be much more abundant; for though I saw several about the coal-mines, there must have been many Orangs about every day, and in a year their deserted nests would become very numerous. The Dyaks say that, when it is very wet, the Mias covers himself over with leaves of pandanus, or large ferns, which has perhaps led to the story of his making a hut in the trees.

Among the more striking vegetable productions of the Indo-Malay Islands, are the singular pitcher-plants, which run over the ground in all directions, and climb the shrubs and smaller trees. The pendent pitchers, gorgeously coloured, are conspicuous on every hill-side and mountain-top. Here, too, the graceful tree-fern, rearing its head to the height of fifteen feet, grows quite down to the level of the sea. The orchids are abundant, but frequently wanting in flowers of any size. Among them, however, are the fine *Cœlogynes*, with their large clusters of yellow flowers, and the extraordinary *Vanda Lowii* with its long spikes hanging from the lower branches of trees and covered with orange and red flowers. The author also saw a number of curious trees of the genus *Polyalthea*, which were about thirty feet in height; their slender trunks “covered with large star-like crimson flowers, which clustered over them like garlands, and resembled some artificial decoration more than a natural product.” Other trees are sometimes found which appear to have begun growing in mid-air, “and from the same point send out wide-spreading branches above, and a complicated pyramid of roots descending for seventy or eighty feet to the ground below.” These originate as parasites in the forks of lofty trees, and grow up from seeds dropped by birds in their flight. Among the fruits is the delicious durian, with its “rich butter-like custard, highly flavoured with almonds.” The durian grows on a lofty tree, is about the size of a large cocoa-nut, and is covered all over with short stout spikes, whose points are very strong and sharp. When the fruit is ripe it falls of itself, and frequently strikes the natives, and inflicts a dreadful wound, from which death sometimes ensues. Mr Wallace’s remarks on this subject are forcible and apt, and should certainly be read by European fabulists whose ethical inductions are drawn from incomplete observations:

Poets and moralists, judging from our English trees and fruits, have thought that small fruits always grew on lofty trees, so that their fall should be harmless to man, while the large ones trailed on the ground. Two of the largest and heaviest fruits known, however, the Brazil-nut fruit (*Bertholletia*) and Durian, grow on lofty forest trees, from which they fall as soon as they are ripe, and often wound or kill the native inhabitants. From this we may learn two things: first, not to draw general conclusions from a very partial view of nature; and secondly, that trees and fruits, no less than the varied productions of the animal kingdom, do not appear to be organised with exclusive reference to the use and convenience of man.

To the naturalist wishing to examine the variety and beauty of tropical productions, Java is the most interesting island in the world. Forty-five volcanic mountains, many of them in constant activity, display the wonderful effects of the subterranean forces of the globe. Its surface is covered with magnificent

forests, teeming with every variety of animal life, and presenting many species found in no other part of the world; while its soil is so fertile and productive, that all the vegetation of the tropics, as well as many of the productions of the temperate zones, can be successfully cultivated. To the antiquarian, too, Java is of more than ordinary interest. The religion of the Brahmins flourished in it from the darkest obscurity of the traditionary past down to the year 1478, when that of Mahomet obtained ascendancy. Buried in the gloomy depths of its forests, and covered by the wild luxuriance of tropical vegetation, are the ruins of temples and mausoleums, abounding in curious carved figures, attesting to the former prevalence of the Brahminical superstitions; while the remains of extensive cities are the indications of a civilisation which the fanatical followers of Mahomet were never able to attain. Among some of the more celebrated ruins of the island are those on a mountain named Gunong Prau. Here an extensive plateau is covered with ruined temples.

To reach these temples four flights of stone steps were made up the mountain from opposite directions, each flight consisting of more than a thousand steps. Traces of nearly four hundred temples have been found here, and many (perhaps all) were decorated with rich and delicate sculptures. The whole country between this and Brambanam, a distance of sixty miles, abounds with ruins; so that fine sculptured images may be seen lying in the ditches, or built into the walls of enclosures.

In the eastern part of Java, at Kediri and in Malang, there are equally abundant traces of antiquity, but the buildings themselves have been mostly destroyed. Sculptured figures, however, abound; and the ruins of forts, palaces, baths, aqueducts, and temples can be everywhere traced. It is altogether contrary to the plan of this book to describe what I have not myself seen; but, having been led to mention them, I felt bound to do something to call attention to these marvellous works of art. One is overwhelmed by the contemplation of these innumerable sculptures, worked with delicacy and artistic feeling in a hard, intractable, trachytic rock, and all found in one tropical island. What could have been the state of society, what the amount of population, what the means of subsistence which rendered such gigantic works possible, will, perhaps, ever remain a mystery; and it is a wonderful example of the power of religious ideas in social life, that in the very country where, five hundred years ago, these grand works were being yearly executed, the inhabitants now only build rude houses of bamboo and thatch, and look upon these relics of their forefathers with ignorant amazement, as the undoubted productions of giants or of demons. It is much to be regretted that the Dutch Government do not take vigorous steps for the preservation of these ruins from the destroying agency of tropical vegetation; and for the collection of the fine sculptures which are everywhere scattered over the land.

We cannot close our necessarily brief notice of these interesting volumes, without mentioning some curious instances of mimicry in insects, which serve further to illustrate the theories started by Mr Wallace in his admirable article entitled 'Mimicry and other protective resemblances in Animals,' which appeared in the *Westminster Review* for 1867. It will be remembered that the author there mentions many instances of protective resemblances in animal life. He instances the tiger, which in Bengal is striped to match with the bamboos among which it couches; while the same animal in South America is spotted to suit the trunks of trees on which it reposes. The bear of the American forests is brown, while the polar bear roaming amidst the ice and snow is white. The same phenomenon of colour is observed in many other animals and birds which inhabit different regions of the globe. Anglers as well as naturalists will inform us how the colour of every fish is suited to the river bed which it inhabits, while students of entomology will bring forward further instances of protective resemblances among insects. In the volumes before us, Mr Wallace draws attention to a case of mimicry among butterflies in Sumatra, very similar to that mentioned by Mr Bates in his South American travels. The cause of this mimicry appears

to be that the “butterflies imitated belong to a section of the genus *Papilio*, which from some cause or other are not attacked by birds, and by so closely resembling these in form and colour the female of *memnon* and its ally escape persecution.” Our author also mentions a curious butterfly of the same island, which in its position of repose so nearly resembles a dead leaf that it is almost certain to deceive the eye, even when looking full upon it. A strange instance of mimicry among birds Mr Wallace observed in the Moluccas. He constantly mistook a little bird called *Mimeta bourensis* for the *Tropidorhyncus bourensis*, belonging to an entirely distinct family. Now the former is a strong and active bird, with powerful claws and beak, while the latter is a comparatively weak bird with small feet and claws; and hence the use of the weaker imitating the flight and general appearance of the stronger. But nature also assists here, since she has painted the *Mimeta* with the same tints as she has used for the *Tropidorhyncus*. In fact Providence seems to have given certain animals weapons and strength, while she has invested others with the invisible tunic of the fairy tale, or has endowed them with greater

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gifts of mimicry than those possessed by the magicians of the Arabian Nights.

Mr Wallace deserves all the praise which we can bestow upon him, for his lucid arrangement of facts, and for the pleasant and suggestive style in which he narrates his travels. Many of the chapters are exceedingly novel and amusing, while his scientific generalisations should be carefully read by all students of natural history.

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*The Alfred Russel Wallace Page*, Charles H. Smith, 2015.