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'A Botanist in Amazonia.'

Notes of a Botanist on the Amazon and Andes. By Richard Spruce, Ph.D. Edited and condensed by Alfred Russel Wallace, O.M., F.R.S. In two volumes. (Macmillan, 21s. net.)

This is a book of more than usual interest. It rescues from oblivion the lifelong and devoted labours of a distinguished and gifted naturalist, and more especially the record of his remarkable travels on the Amazon and many of its great tributaries, and in the Andean highlands of Ecuador. Before the publication of these two admirably edited volumes the botanical and scientific achievements of Richard Spruce, as a fearless and keen-eyed explorer, have remained practically untold; but, although forty-five years have elapsed since his return from South America, the story has lost singularly little as a record of adventure, discovery, and research. The truth is that a very large part of the ground he covered during the fifteen years (1849-64) of his sojourn in Amazonia remains almost as unknown at the opening of the twentieth century as in the first decade of the second half of the nineteenth.

Dr. Spruce had during his lifetime (he died December 28, 1893) published a considerable number of papers in scientific journals and reviews upon the botanical results of his expeditions, and his massive work on the "Hepaticae of the Amazon and the Andes of Peru and Ecuador" (which appeared in 1885, as a volume of the Transactions and Proceedings of the Botanical Society of Edinburgh) won for him a high place in the estimation of the scientific world both at home and abroad. His journals, however, kept during his travels were never published. It had been the intention of Dr. Spruce to hand over these journals, with his correspondence and notes, to Mr. David Hanbury, as his literary executor; but the sudden death of Mr. Hanbury and his own persistent ill-health prevented any steps being taken for editing and printing them. But he has been fortunate enough to find in another friend, Dr. Alfred Russel Wallace, one specially qualified to undertake the task. Dr. Wallace, as is well known, explored as a naturalist portions of the very same region as Dr. Spruce, and contemporaneously (1848-52). Spruce, being well aware how occupied Dr. Wallace was with his own work, appears never to have thought of him as a literary executor. After Spruce's death, however, Dr. Wallace offered to examine his journals and other papers, and to edit a narrative of his travels, if the material was judged by him suitable for publication. But amidst the pressure of other labours eleven years were to elapse before the task was even seriously begun. Once begun it has been steadily carried out, and its issue has been the publication of "Notes of a Botanist on the Amazon and Andes." Dr. Wallace says that his aim has been to produce a narrative of interest to the general reader, as well as to the botanist, and he adds:—"This task has been to me a labour of love, and I have myself so high an opinion of my friend's work, both literary and scientific, that I venture to think the present volumes will take their place among the most interesting and instructive books of travel of the nineteenth century." Such a judgment by such an authority is of itself sufficient to commend the book to the public and secure for it a wide circle of readers.

The narrative of Spruce is preceded by a biographical introduction, in which Dr. Wallace gives a lifelike sketch of his friend's striking personality, of his home surroundings, and of his devoted labours amidst great difficulties in that field of botanical research which he had made peculiarly his own. Born in

1817, the son of a village schoolmaster, Richard Spruce spent the greater part of his life in three small Yorkshire villages, Ganthorpe, Wellburn, and Coneythorpe, all in the close neighbourhood of Castle Howard mansion and park. Educated wholly by his father, he began life as a tutor at Haxby, and was afterwards for five years a mathematical master at the Collegiate School at York. Ill-health compelled him in 1844 to give up teaching as a profession. He had always had an inborn love of nature, and especially of plant life, and had made botanical excursions in various parts of his native county to collect specimens of its mosses, lichens, and hepaticæ. He proved himself a lynx-eyed explorer and discoverer of new species, and his papers speedily attracted attention. In the spring of 1845, by the liberality of the eminent botanists Mr. Borrer of Henfield, Mr. George Bentham, and Sir William Hooker, he set out upon an expedition of research in the Pyrenees. The result of a year's work was an immense increase in his reputation. His friends now determined to offer financial support for a much larger undertaking—the botanical exploration of the Amazonian basin. Spruce decided to accept the invitation, and on June 7, 1849, he set sail for Pará. He returned almost exactly fifteen years later a broken-down invalid. Having lost the greater part of his small savings by the failure of a bank at Guayaquil, he now settled in a small cottage in the hamlet of Coneythorpe, amidst the rural scenes where his youth had been passed. Here he spent the remaining twenty years of his life, always in distressing pain from an internal complaint, and rarely able to stir outside his door, but struggling on with his literary and botanical work to the last, and keeping up a constant correspondence with his many friends. The two volumes edited by Dr. Wallace contain the account of his long sojourn in South America. It will be seen from them that Spruce had many literary gifts. His style is crisp, lively, and graphic. Even in the more scientific portions of the narrative he is never dull. It would have been a distinct loss had such a record of exploration remained unpublished.

One of the remarkable features of the Amazonian river system on which Dr. Spruce lays emphasis is the fact that some of the streams are white-water streams of a yellow or muddy colour, others are blackwater streams perfectly clear and translucent. Spruce resided for some time at Santarem, which lies at the junction of the dark blue Tapajos with the main trunk stream of the Amazon, and he writes:—"When I first saw it the blue water extended down the southern side of the river for several miles before being absorbed in the muddy expanse." He made Barra (now Manáos), at the mouth of the Rio Negro, his headquarters more than once, and thus describes it:—

The change from the yellow water of the Amazon to the black water of the Rio Negro is very perceptible and indeed abrupt. The latter is black as tar when viewed from above, and stones or sticks at the bottom seem red; but when taken up in a glass it is of a pale amber colour, and quite free from any admixture of mud.

At these two points in particular, as well as at many others, Spruce had ample opportunity of observing the natural characteristics of the two types of river. The floating grass islands that are one of the wonders and dangers of the Amazon he found to belong only to "white-water" rivers. The grass called *Caapin* grows, when the water is low, along the margins of the river, but when the river rises to full flood the grass is torn from its roots and floats down stream. Spruce drew out a stem 45ft. long with 78 nodes from which the rootlets grew. The *Caapin* is never found along the whole course of the Negro and Tapajoz and other black-water streams. The vegetation generally as well as the fish and insect life differed. The report of the expedition made in 1860, on behalf of the Indian Government, to procure seeds and plants of the red-back tree in the Chinchona forests on the western slopes of Chimborazo is historically as well as botanically interesting, for it led to the introduction of red-bark cultivation into India. It was on this

expedition that Spruce acquired the distressing complaint that was to make him an invalid for the rest of his life.

It is very sad to note that at the time when Spruce visited the Amazon—with the exception of a very few spots at long distances apart—the mighty river, with its vast network of tributaries, was practically deserted. The traveller speaks of the Rio Negro as "the dead river." The immense area contained only scattered groups of Indians, with here and there a few half-breeds. Some progress, with the introduction of steam navigation, has been made since the period with which these volumes deal, but still the far larger part of the Amazonian region is, to all intents and purposes, uninhabited. To any one who has studied the history of exploration and settlement in the basin of the Amazon from the days of Orellana, Teixeira, and Samuel Fritz, to those of La Condamine, Humboldt, and Schomburgk, the silent fact that stands out is the failure alike of Portugese and Spaniard to utilize the splendid waterways and rich territory which they had had the good fortune to acquire. All the earliest records show the banks thickly populated by native tribes.

The chapter on "the engraved rocks of the Rio Negro and Casiquiari" contains some curious information on the subject of the Indian picture writing. The preceding chapter on "the women warriors of the Amazon" gives a very accurate survey of what is known historically about the nation of Amazons, whom Orellana believed that he encountered on his descent in 1540 of the river to which they gave their name. Spruce has collected all the evidence bearing on the subject of the existence of these women warriors, and has come to the conclusion that there lies historical fact behind the legend. He is probably right. In his view, the country of El Dorado was Peru and the Golden Lake the Pacific Ocean; he is not justified, however, in ignoring the almost universal tradition that these localities lay in the interior of the continent. The site seems to have been originally at Lake Titicaca, and then to have shifted gradually northwards, first to the islands of the Omaguas in the Upper Amazon, then to Lake Parima and the city of Manoa, famed in the narrative of Raleigh. The advance northwards may indicate the migration of a body of the followers of the Incas, who fled before the Spanish invasion. More probably the two last-named localities (and there are several others) represent the centres where traffic in gold brought from the interior was carried on with the tribes of the Upper Amazon and with those who lived at the headwaters of the rivers running into the Caribbean Sea.

There are a number of maps—one of Equatorial South America, with all Spruce's travels delineated in red—one of the Upper Negro and Upper Orinoco, likewise with routes in red; one of the Pacimoni river (drawn by Spruce); a sketch map to show Spruce's excursions at Tarapoto; one showing Spruce's principal routes in the Andes; a map to illustrate Spruce's report on the "red-bark" region of Ecuador; and, lastly, a map of the mountains of Llanganati. These maps, some of which were first published in the journals of the Royal Geographical and Linnean Societies, are valuable adjuncts to the volumes, and a great help to a clear understanding of the narrative. There are plentiful illustrations, some of them taken from photographs of the forest scenery, but chiefly from Spruce's own pencil sketches and drawings, among them many portraits of Indians. At the end of the second volume will be found a useful glossary of native names and an index, chiefly botanical.