

reach the west coast from Christchurch. He reached this saddle on the 20th of April, but, instead of returning, he continued the journey with one of his men, sending the rest of the party back to wait for him on the known Alpine saddle between the sources of the Hurunui (east coast) and Taramakau (west coast).

“Having crossed the pass, he arrived at the sources of the Hokitika, an important river which reaches the sea about 15 miles south of the Taramakau, on the 3rd of May. Although Mr. Whitcombe was an accomplished surveyor, a good mathematician and astronomer, who had worked successfully in India and Australia, he had had no experience in New Zealand bush-travelling, which requires not only strong men, able to carry a heavy load and to stand hunger, fatigue, and cold, but also a general knowledge of the nature of rivers and the best way of crossing them.

“Owing to his deficient arrangements, Mr. Whitcombe on reaching the coast was so exhausted, that he had great difficulty in walking to the Taramakau, where he hoped to find a Maori settlement, in order to procure some provisions, as they had finished all theirs.

“Unfortunately the few Maories who lived there had left the settlement, so they determined on following the coast to the mouth of the river Grey; for this purpose they had to cross the Taramakau, which is a large and rapid river.

“As no large canoe was to be found, they tied two small old ones together; but when they reached the current, their contrivance began to sink and drift towards the bar. Mr. Whitcombe, who was a good swimmer, jumped into the water and attempted to reach the shore; but, being in such an exhausted condition, he was drifted into the surf at the mouth of the river, and unfortunately was drowned. His companion, who could not swim, had a most miraculous escape; by tying his right hand to one of the canoes, he succeeded in remaining with it, being tossed about for many hours by the advancing and receding waves. He was at last cast on shore, and, on recovering himself, he worked his way up the banks of the Taramakau for a few miles, and fortunately fell in with some Maories, who gave him a few potatoes. He at last arrived at the saddle of the Taramakau, where his former companions awaited them; and I may here state, as an instance of the sufferings which he had endured, that his companions, even after conversing with him for some time, did not recognise him, so much was he altered, and this after an absence of only twenty days.”

The second Paper was entitled:—

“*On the Frontier Province of Loreto in North Peru.*” By Professor DON ANTONIO RAIMONDY of Lima (Honorary Corresponding Member, R.G.S.).

Communicated by W. BOLLAERT.

THIS communication gives an instalment of the author's labours during the past twelve years, to make known the many valuable products of Peru, in carrying out which object he has made numerous excursions in all directions into the interior.

The province of Loreto is as large as all the other departments together, and extends from the Cordillera region of Pasco to the junction of the Amazon with the Jarava, its south-west portion being mountainous, while its eastern districts consist of extensive plains, well-watered and covered with luxuriant vegetation. In the

mountainous region the most prominent physical features are the passage of the Huallaga through a gap in the mountain-chain, and the renowned Pongo de Manseriche through which the Marañon effects its escape. The plains consist of the usual alluvial soil, entirely free from pebbles, which is characteristic of the great South American plains bordering on the Amazon.

The climate of Loreto is hot and moist, the mean temperature being 21° to 22° C. (71°-73° F.), while such is the humidity that in a few days, boots, clothes, &c., become covered with microscopic vegetation. At midday, however, the thermometer indicates as high as 93° temperature, which, owing to the immense amount of moisture, becomes almost insupportable. The rainfall here is probably at least as heavy as at any other spot on the globe, which the author is inclined to attribute in great measure to the congelation and condensation of the s.s.w. winds upon the snow-covered summits of the Andes, combined with the known phenomena of the north-east and south-east trades upon their eastern slope, as hitherto maintained.

After noticing the layer of sand, 40 to 60 miles in width, which covers the sea-coast of Peru, the sea-shells found in which in large quantities, of descriptions similar to those which abound in the adjacent sea, seem to indicate that it was upheaved at a recent date from the ocean, and commenting on the phenomena of temperature likely to occur from these physical features, Señor Raimondy elucidates his theory that this peculiarity of soil has, coupled with the prevailing winds on the opposite side of the mountain-range, a great deal to do with the climatic extremes already alluded to. He then examines the origin and cause of the network of rivers of the lower region of Loreto, and considers fully what stream is really entitled to be regarded as the parent stream of the mighty Amazon (the name Orellana, imposed on it in honour of its discoverer, has become entirely disused).

A list of affluents follows, furnishing a very much needed contribution to the geography of that region, which concluded, he passes to the consideration of the three main streams, the Marañon, the Huallaga, and the Ucayali; most of the various affluents from the north alluded to or named as flowing through Peruvian territory, having their sources and the upper portions of their course lying within the state of Ecuador.

The roads * entering this extensive territory are only three in number—one from the north, one in Central Peru, and one from the

* Besides these "roads" (as Señor Raimondy terms them, though a recent letter suggests "broken ladders after an earthquake" as a much more faithful and apposite description of them), the author of the Paper mentions several other paths leading over the Cordillera into Loreto province.

south; the capital, Moyobamba, a city of 8000 souls, but covering as much ground as Lima, being situated in the extreme north-west corner of the province, not far eastward of Chachapoyas, with which one of these roads communicates. The soil is a sandstone so loose that one single very heavy rain will occasionally work a channel of immense depth. The food is chiefly vegetable, and the principal manufacture that of what is known in Europe as Panamá straw-ware. In one province, that of Tarapto, the exchange medium is wax, a hard day's work being remunerated by 4 oz. wax! Several particulars were given of the towns and villages of this immense region, in one of which the circulating currency is large needles, each representing 1*d.* sterling. The universal currency, however, is cotton cloth, which, as in Africa, has a fluctuating value; but always commands its own value in barter.

The mineral products of the district adjoining the rising grounds are rock-salt (with lime-springs near), sulphate of lime, alum, sulphur (pure), iron-ore and lignite; and gold is found on the great river Napo. This whole region has recently been opened up by improved steamers, when it is at least probable that a very great development of trade must take place to Pará and Europe on one side, and to Callao and the Far East on the other. At present, however, the navigation of the river is only open by the jealousy of the Brazilian Government to the Peruvians, in order that they may reach their own country from the Atlantic.

The PRESIDENT stated that Don Antonio Raimondy had been employed during twelve years by the Government of Peru in collecting statistical and geographical materials in regard to the produce of the country; and the Council had thought him well worthy of being elected an Honorary Corresponding Member of the Royal Geographical Society. The subject brought before them was of vast extent, and he hoped there were gentlemen present who could point out the great advantages to be derived from a trade with Peru carried on by ascending the Amazon to those great affluents which flow into it from the Cordilleras. When they considered the comparatively waterless condition of the region on the Peruvian side of the Andes, and also what easy communication all that region could have with the Atlantic by means of these tributary rivers flowing eastward into the great stream of the Amazon, they would see how important it was to the commerce of the world to have this communication opened up. He knew no gentleman so competent to speak upon this subject as Mr. Markham, who had travelled in Peru, and who had written most instructively and eloquently upon that region.

Mr. CLEMENTS MARKHAM said he had descended many of the tributaries of the Amazon a considerable distance, but he had never entered upon the province of Loreto. He had, however, studied the subject of the Paper a great deal while in Peru and since his return to England. It was very remarkable that such an enormous surface as the 2,500,000 square miles which comprise the basin of the Amazon had been so little explored during the three hundred years that the coast-line of South America had been known to geographers. Some daring spirits did in the sixteenth century descend into these forests in search of the lake in which dwelt the man who was covered with gold-dust, and

they penetrated hundreds of miles on foot to points on the Caquetá, Purus, and other large streams, which had never been reached by any scientific or mercantile traveller since their time. They were the great explorers of the Amazon valley. In the succeeding century the missionaries descended some of the rivers, but they appeared to have been very superstitious and very timid. He had in his possession the manuscript journal of one of these missionaries, who observing, one morning, a jaguar crawl along the branch of a tree and pounce down upon a great porpoise, which was browsing upon the banks of a river, and drag it on to the beach, was so dismayed at the thought that a similar fate might befall him if his canoe happened to be under the branches of one of the trees at night, that he relinquished his mission and returned. In the present century scientific men had shown greater zeal and greater energy, and had spent many years of their lives, separated from all their friends, in exploring these unhealthy regions.

The PRESIDENT introduced Mr. Bates and Mr. Wallace, as gentlemen who had a personal knowledge of the physical features of the Amazon.

Mr. BATES said he had ascended the Amazon from its mouth as far as the Peruvian frontier, a distance of 1800 miles from the Atlantic, and had travelled over large portions of it many times. The breadth of the river varied from a mile and a-half to seven miles. It winds along in lengthy curves, forming magnificent reaches. Every inch of the banks is covered with forest vegetation; indeed, the whole country is covered with one vast matted forest, growing to an enormous height, and presenting a most picturesque and varied scene. It is a very healthy country. He knew Englishmen both at Pará and Santarem, who had lived there thirty or forty years, and they still bore the florid complexions of their countrymen. The whole of this distance of 1800 miles lay in Brazilian territory, which in the valley of the Amazon embraces a region 800,000 square miles in extent, of the most fertile soil in the world. In passing along the river in native canoes he frequently noticed that the banks are composed of a rich crumbling vegetable mould, fifteen to twenty feet in depth. Yet this grand country is almost without inhabitants. The population at the last census exceeded but little 230,000 souls, which is in the ratio of one person to every four square miles. In the province of Archangel, the most forbidding country in northern Europe, the population is in the ratio of four persons to one square mile. In consequence of this scantiness of population in the valley of the Amazon, there was no agriculture carried on. He never saw a plough, and he could count on his fingers the number of hoes and spades that he saw during the whole of the eleven years he was there. The trade is entirely confined to gathering the spontaneous productions of the forest—india-rubber, chocolate-nuts, brazil-nuts, sarsaparilla, vanilla, &c. Timber is scarcely yet become an article of export, though the country abounds in the most beautiful and varied descriptions of woods. The total exports from this country all pass through the port of Pará, and do not exceed 400,000*l.* per annum, of which india-rubber comprises about one-third, and chocolate-nuts one-half. It is an interesting problem how this country is to be peopled. The Brazilian Government have set their faces against the importation of negro slaves, and he was afraid that European immigrants will be of little use in field labour.

MR. WALLACE said he went about a thousand miles up the Amazon and ascended the Rio Negro. During the four years he spent there, he acquired all the information he could respecting the country. The surface is covered with the largest unbroken forest in the world; it is the great physical feature of South America. At the mouth of the Amazon the forest extends only a few hundred miles into the interior, and then you get to the mountainous district of Brazil and Guiana, which is partly open country mixed with wood. Farther up the river an enormous plain opens out north and south, extending to the foot of the Andes, entirely covered with forest. The forest is of such

extent that countries like England, France, Spain, and Germany might be thrown down in different parts of it, and they would be absolutely lost there—you might travel about for years and never hit upon them. It is an interesting problem to ascertain why it should cease so abruptly to the north and to the south. To the north you come at once to the open grassy plains on the Orinoco, and to the south you come to similar open plains on the Paraná. The river is also equally note-worthy from its enormous extent and the isolation of those nations that dwell in the interior. The people, the greater part of them, are utterly ignorant of any other country but their own except by vague report. All their ideas of geography are connected with this river; the position of other countries is conceived of as either on one side of the river or the other. Even comparatively educated people, Brazilians and Spaniards, who have been born and educated there, in questioning him about France and England, have asked on which side of the river they are situated. They imagine that the Amazon river flows all round the world, and that every country must be situated on one side or the other.

MR. GERSTENBERG gave some particulars relative to a German settlement which, on the invitation of the Peruvian Government, had established itself on the eastern slope of the Andes, in the year 1856, adding that it was the great wish of the country to introduce European emigrants. But to accomplish that object successfully, it was necessary, he argued, that the emigrants should be able to ascend the Amazon by way of Pará. At present the navigation of this river was hermetically sealed by the Brazilian Government against the flags of all nations, except the riverain states, Peru, Ecuador, Venezuela, Granada, and Brazil. But these four republics had no ships, consequently the whole of the navigation was entirely in the hands of Brazil. He mentioned special instances of the difficulties to which this restriction had given rise, and alluded more particularly to a monopoly for 30 years, terminating in 1880, which had been conceded to the Pará Steam Navigation Company, by which during the whole of that period the Amazon would be closed to the commerce of the world. He considered this a great hardship, and he hoped, whenever an arrangement of our present difficulties with Brazil took place, that the British Government would bring forward the question of the opening of the Amazon.

MR. BOLLAERT, the translator of the Paper, said he would advert to only one point—the healthiness or the unhealthiness of the climate in the province which was the subject of the Paper. The only unhealthy parts are some of the valleys which run down from the great chains of mountains, where there are occasional visitations of intermittent fever. But lower down, in the great bends of the river, the climate is perfectly healthy. He had paid some attention himself to the geography and geology of the country, and he thought Professor Raimondy had done justice to both those branches of the subject in his Paper. A serious consideration, however, pressed itself upon his mind, namely, the continued opposition of Brazil to the general navigation of the sea-like river Amazon, and he would suggest, if Brazil persisted in keeping the navigation of it closed, that the Mersey and the Thames be closed to the Brazilian flag.

The meeting was then adjourned to 22nd February.