

THE NEW EXPLORATION OF THE AMAZON RIVER, BY PROFESSOR ORTON.—UP THE AMAZONS.

No. 4.

FROM THE NEGRO TO THE ANDES.

Manaos is an important point of departure for several lines of steamers. Steamers leave regularly for Pará and Tabatinga, and for the Madeira, Negro, Purús, and Juruá. The fare up the Madeira is \$40, and up the Purús, \$50. From Manaos to Tabatinga, on the frontier of the empire, is one thousand miles. The Icamíaba, the first and only steamer, which has been running for nearly twenty years, leaves Manaos the 11th of each month; fare, \$50; time, one week.

The Solimoens, as this middle portion of the Amazons is called, flows through a rank wilderness, broken at few points by the hand of man. There are, probably, not a hundred acres of cultivated land between the Rio Negro and the base of the Andes. The whole country is a vast plain of slight elevation, without hills or sandy campos, but with a soil of stiff clay covered with vegetable mold, and a lofty, luxuriant, humid forest. Palms are comparatively few, the most numerous being the short murumú, the slender assái, the spindle trunk pashíaba, the beautiful tucumá, and the urucurí, the nuts of which are used in smoking rubber.

VALUABLE TIMBER.

But it is heavily timbered with useful woods, as cedar, copal, andiróba, guacapú, capiróna (called pao mulatto in Brazil, furnishing the fuel used by the steamers), sicupéa (an excellent boat timber), acari-cuára, acariúba, moira pirárga or red wood moira coatiára or striped wood, itaúba, jutahi, sapupíra massarandúba or cow tree (one of the most valuable and durable woods on the river), paracu-úba (a very hard wood used for harpoons, etc.), cumarú, palo de cruz, palo d'arco, and many kinds of loiro. And yet there is not a saw mill between Manaos and Iquitos, a distance of 1,300 miles!

We see three varieties of banks: low, alluvial deposits covered with arrow grass or wild cane; slightly higher land covered with broad leaved plants and dwarf palms, with a dense forest of lofty trees in the *terra incognita* beyond, the most common aspect; and cliffs of variegated clay from 25 to 50 feet high, generally cut squarely away by the current, presenting a massive colonnade of trees loaded with parasites and wound with creeping plants. The signs of animal life are not proportioned to this exuberance of vegetation. White egrets and tall gray herons stalking along the edge of the water; hummers whirring among the flowers; macaws and parrots flying across the river; capybaras on the banks, and rolling porpoises and ugly alligators in the water; these are the most conspicuous forms. But the most numerous and the most dreaded of all animals on the Solimoens are the

INSECTS.

As we have already remarked, the strong trade winds keep the Lower Amazons clear of these pests; but soon after leaving Manaos, the traveller becomes intimately acquainted with five insects of torture: (1.) The carapaná, called mosquito in the United States and Europe, and sancúdo on the Marañon and in Spanish America generally. (2.) The píum or sand fly—the scourge of the Amazons, called mosquito in Peru—a minute, dark colored dipter with two triangular horny lancets which leave a small circular red spot on the skin. It works by day, relieving the carapaná at sunrise. (3.) The motúca (tábono in Peru) of the size and general shape of the house fly, of a bronze black color, with the tips of the wings transparent, and a formidable proboscis. (4.) The moquim (ysanguí in Peru), a microscopic scarlet acarus, resembling a minute crab under the glass. It swarms on weeds and bushes, and on the skin causes an intolerable itching. An hour's walk through the grassy streets of Tefé was sufficient to cover our entire body with myriads of moquims which it took a week to exterminate. (5.) Carapátos or ticks, which mount to the tips of blades of grass and attach themselves to the clothes of passers by. In sucking one's blood, they cause no pain, but serious sores result if the proboscis breaks off in the wound. Besides these are ants innumerable in species and individuals, and of all sizes from the mammoth tokandára, two inches long, to the small red ant of the houses. The sauba is the most mischievous, from its habit of marching in broad columns and stripping the most valuable cultivated trees of their foliage. Everywhere, from Pará to the mountains, complaints are heard of this terrible pest. In some places, agriculture is impossible. These half a dozen forms of insect life must for ever hinder the settlement of the Amazons. It is true, however, that they have their migrations: Fonte Boa, for example, the paradise of mosquitos in Bates' time, is now nearly free from them. There are two kinds of bees on the River, the black and yellow. Their cells are not hexagonal, but like those of the humble bee, and the honey is thin and sour when collected. Scorpions and tarantulas exist, but not in such numbers as to be dreaded.

THE GREAT WILDERNESS.

Man makes an insignificant figure in the vast solitude of Alto Amazonas. From Manaos to the entrance of the Huallaga, a distance of 1,700 miles, there are probably not over 10,000 inhabitants scattered along the banks of the river and its inlets. The largest Brazilian town west of Manaos is Tefé, the Omaha of South America in position; yet it contains scarcely 2,000 souls, although the best agricultural region on the Solimoens. It exports annually 40,000 or 50,000 arrobas of rubber, and 4,000 or 5,000 arrobas of pirarucú fish. Here also are manufactured, by wild tribes in the interior, the celebrated grass hammock woven from the fiber of the tucum

palm. The population of the Upper Amazons has not increased with the introduction of steamers. The climate is healthy, although one lives in a constant vapor bath, and Nature is bountiful. Epidemics are unknown, and ague is confined to dark colored or sluggish tributaries.

Between Tefé, where Bates spent four years and a half and Agassiz six months, and Tabatinga, the frontier fortress of the Empire, is the most uncivilized part of the Amazons. Yet here enter five great rivers which are destined to be famous: Japurá, Ica, Juruá, Jutahí, and Javari. The only towns are Fonte Boa, Tonantins, and San Paulo, built on slippery clay bluffs, and exporting the produce of the forests and waters. Rice and cotton might be grown in vast quantities on the lowlands after the subsidence of the river. But the people, mainly the half civilized Tucúna Indians, prefer to collect rubber, catch turtles, swing in their hammocks, and live on pirarucú and plantains.

Tabatinga is a village of barracks, defended by sixteen guns and ornamented with graceful tucumá palms. This has been a military post since 1776. It stands on a high bluff of variegated clay which gives its name to the whole Amazonian clay formation. The depth of the river here is from eight to twelve fathoms, the difference between high and low water being thirty-six feet. The current, at flood time, is five miles an hour.

STEAM ON THE MARAÑON.

Here we exchanged the Brazilian Icamíaba for the Peruvian Moróna. At present, the following steamers are afloat on Peruvian waters: Moróna, Pastássa, Tambo, Putumáyo, Napo, Moiro, Alceste, and Ucayali, the last two belonging to private individuals. The Moróna is an iron vessel of 150 horse power, with a tonnage of 500, and consumes about 450 sticks per hour, which cost \$14 per thousand. The rate is eighteen miles down stream, and nine up. The running time from Tabatinga to Yurimaguas is ninety hours; distance about 800 miles. She leaves Tabatinga the 21st of each month, and Yurimaguas, the 9th. The first class fare is \$60, passengers providing their own bedding. There are no accommodations for ladies.

Travel on the Marañon exceeds that on the Solimoens. Nevertheless, the towns are decaying, excepting Iquitos and Yurimaguas.

TURTLES AND FISHES.

Life within the Marañon presents greater variety, at least for commercial purposes, than in the Amazons below. This is the great turtle field; and turtle hunting is the chief business in the dry season. They are to be found on the main river and all the tributaries from the Madeira to the Huallaga; but Cabalocochoa is considered the best region: 4,000 were caught on one playa in one year. They furnish the staple meat of eastern Peru, and the oil expressed from the eggs is an important article of export. The turtles of commerce are the tartaruga grande (charápa), measuring three feet by two, and the smaller, but more delicious, tracajá (charapita). The females only are taken, so that the males, which are inferior in size, must far outnumber them. The average price of the larger turtle is two dollars, and of the tracajá, fifty cents. Besides these are the mata-mata and aiassá. The largest fish in the Amazons is the sárgaro (in Brazil called the tuberon), sometimes weighing three hundred pounds, and is edible; but the most important, as furnishing the codfish of the Amazons, is the pirarucú (called payshi on the Marañon). It abounds throughout the Great River, chiefly in lagunes and in clear water; with farina it constitutes the chief food of the Indians; but it is far inferior to the Newfoundland fish. The Amazons, however, yields many others which compare favorably with the trout and perch; among these are the tambaquí (the gamitana of the Marañon), piranha, corvina, tucunaré, and acara uassú. Rays (at least two species), some three feet broad; the manati or vara-marina, which is potted under the name of mishiri; three kinds of dolphins, the small, dark colored tucuxí, the white boto, and the flesh colored, which is the largest of all; and three species of alligator; abound, especially in the Marañon.

THE BIRMINGHAM OF THE AMAZONS.

Iquitos, the only village of size and enterprise on the Marañon is of recent origin, and now numbers 2,500 inhabitants, English, Americans, Peruvians, Indians, and nondescripts, the last forming a numerous class; for excepting a dozen lawful marriages, the rest are accidental unions. It was founded by the survivors of a massacre at Borga. It stands on a bank of dark clay (containing a multitude of fossil shells and a stratum of lignite), sixty-five feet above the average river, and three hundred and fifty above the sea. The mean temperature is 80°, and the range but 10°. The climate is unusually healthy, the diseases, such as exist, chiefly *la tinta* (dark blotches on the skin), abscess, fever, and dysentery, being due to improper food and want of cleanliness. But Sodom would shine alongside of Iquitos in point of morality and temperance.

The government works are the making of this place. Twenty years ago it was a fishing village of 227 inhabitants; now it contains a machine shop for the repair of steamers, a steam sawmill, and a brick factory. The superintendent and most of the hands are from England.

PRICE OF LABOR.

Carpenters, masons, and machinists get from \$80 to \$100 a month; the first engineer on a steamer has \$145, and the second, \$116, with rations; day laborers have \$10 a month and rations. But the mischief is that this is promised, not paid; some of the foreign employees have not received a cent for sixteen months. By thus withholding payment, the government manages to hold on to imported skill. The

Marañon at present is a burden to Lima, for the works and the steamers do not pay; and Congress votes a monthly subsidy of \$20,000. But it is vital to Peru that she retain this Oriente. Iquitos even exceeds Manaos in

SCARCITY OF FOOD.

She exports nothing but money, and produces nothing eatable. She depends, strange to say, for almost every mouthful of food upon the east, instead of the west; upon Pará and New York rather than upon Moyobamba and Lima. And when the steamer fails to bring a supply, a famine is imminent. Iquitos receives its flour from Richmond and Baltimore; lard from Cincinnati; canned butter from England; potatoes from Portugal; coffee and sugar from Brazil; rice from Ceará and India; and all this, while almost any created fruit and grain would grow on the Upper Marañon or the slope of the Andes. Flour and potatoes sell at 20 cents a pound; butter one dollar a pound; fowls one dollar each; eggs, eighty cents a dozen; cachaça, one dollar a gallon; lime, \$12 a barrel; Newcastle coal, \$80 a tun; logs, \$4 a piece; and it costs \$5 a hundred feet for sawing.

SURVEY OF THE MARAÑON.

We were happy to meet at this place the Hydrographical Commission commanded by Admiral Tucker, which has been engaged for several years past in surveying the Marañon and its tributaries. It has just returned from an elaborate exploration of the Ucayali, ascending the Pichis to lat. 10° 23' 55", or 1,041 marine miles from Iquitos. We look forward to the publication of the report by the Peruvian government with the greatest interest. The determination of the latitude and longitude of prominent points by Captain Rochelle will straighten our geography of the Marañon region; while the meteorological and ethnological observations by Dr. Galt will make a valuable contribution to science. The Commission are about to map out the main trunk of the Marañon from the Javari to Borga, and may then be called to explore Lake Titicaca.

Two little steamers, the Napo, of Iquitos, and the Ucayali, of Nanta, run up the Ucayali to Sarayácu and Cachaboya monthly, the voyage to Sarayácu from Iquitos taking eight days up and four down. The trade at present is light, consisting chiefly in the exchange of English goods and Huallaga salt for salt fish and turtles. But this tributary, contributing more water than the Marañon above it, and navigable for about one thousand miles or within a short distance (*vid Tarma*) from Lima, must ere long become a highway for commerce. A mule road is already projected to connect Sarayácu with the salt mines of Chasuta. Fine gypsum occurs above Sarayácu, and cinnamon around Cachaboya Lake. From the specimens collected by the Commission on the Pachita, exhibiting cyathophylloid corals, brachiopods, and ostreæ, we infer that the formation in that region is Upper Silurian. Nothing in this collection indicates the presence of cretaceous beds intervening between the Silurian and the tertiary clays. The Ucayali, which is built of galvanized iron, has a tonnage of sixty, and draws when laden but three and a half feet, is about to make an exploring trip up the Rio Napo.

The largest village above Iquitos is Nanta, but the busiest is old San Regio—a little huddle of mud huts, but mighty in cachaos. Here they distil and export 2,500 garrafones (seven gallons each) a year of this white rum—the apparent lifeblood of eastern Peru—and sell it at \$5 a garrafon. The cane, of which there is a vast plantation, is luxuriant, but it is said to be too watery for the manufacture of sugar. Salsaparilla and payshi (salt fish) are also shipped from San Regio.

From this point to Borga, the head of navigation on the main Marañon, where the river dashes through a deep gorge in the limestone mountains, is about 450 miles. But trade seldom calls a steamer beyond the mouth of the Huallaga. The Morona turned up this tributary and left us on the clay bank of Yurimaguas, where we leave our readers while we make our foot tramp through the forest and the ascent of the Andes.

JAMES ORTON.

The Hartford Steam Boiler Inspection and Insurance Company.

The Hartford Steam Boiler Inspection and Insurance Company makes the following report of its inspections in the month of August, 1873:

The number of inspection visits made during the month were 1,087; boilers examined, 2,026; internal examinations, 563. The hydraulic pressure was applied in 180 cases. The defects in all discovered were 719, of which 176 were regarded as dangerous. These defects in detail were as follows:

Furnaces out of shape, 51—6 dangerous; fractures, 48—21 dangerous; burned plates, 35—19 dangerous; blistered plates, 123—27 dangerous; deposit of sediment, 105—15 dangerous; incrustation and scale, 97—7 dangerous; external corrosion, 77—22 dangerous; internal corrosion, 18—5 dangerous; internal grooving, 8—2 dangerous; water gages defective, 37—4 dangerous; blow-out defective, 27—6 dangerous; safety valve overloaded, 21—5 dangerous; pressure gages defective, 83—16 dangerous; boilers without gages, 100—3 dangerous; deficiency of water, 7—4 dangerous; braces and stays broken and loose, 47—25 dangerous; boilers condemned, 22. We feel compelled to call attention to the importance of often cleaning boilers out through hand holes. We have frequently recommended this precaution, and we speak of it again because steam users do not seem to attach the importance to it which they should. Scale is thrown off from the boiler, perhaps by some solvent, it accumulates on the bottom and, if not removed, becomes conglomerated with other impurities, covers the fire sheets, and the result is that they are sooner or later badly burned. We would advise all steam users to see that this work is not neglected.