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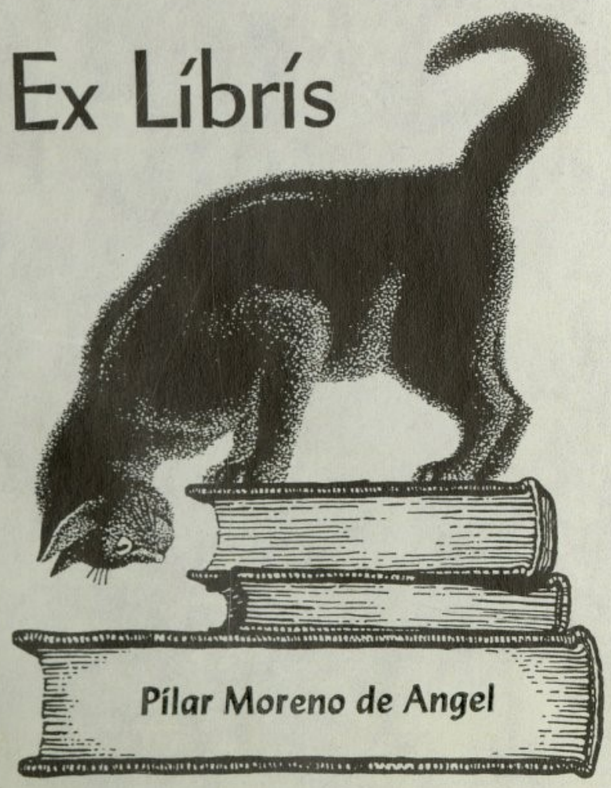

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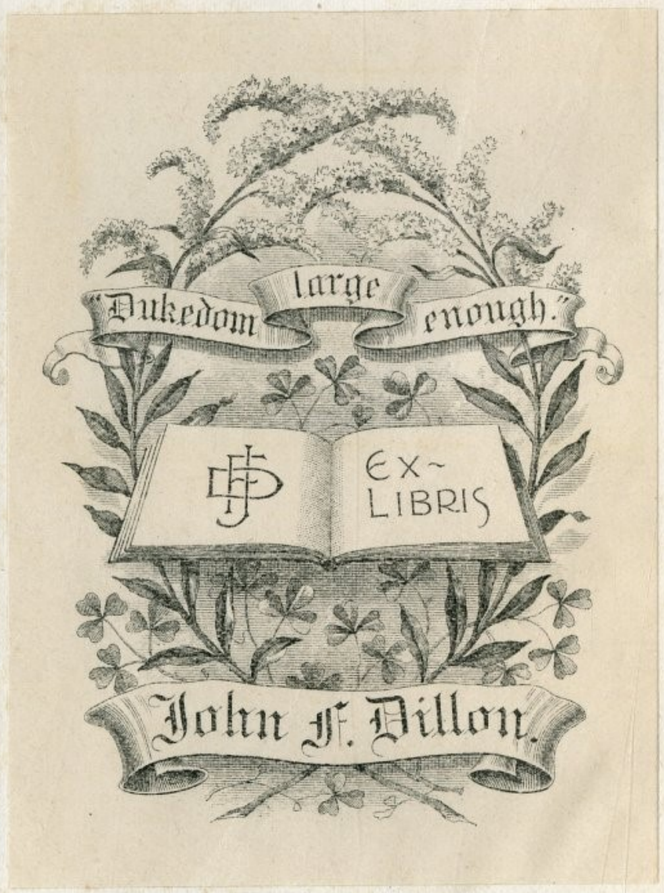

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By Lt L. Gibbon U.S.N.

Lith of P.S. Duval & C° Phil.

LLAMAS TRAVERSING THE ANDES LADEN WITH SILVER.

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33d CONGRESS, 1st Session. } HO. OF REPS. { EXECUTIVE, No. 53.

EXPLORATION

OF THE

VALLEY OF THE AMAZON,

MADE UNDER DIRECTION OF

THE NAVY DEPARTMENT,

BY

WM. LEWIS HERNDON AND LARDNER GIBBON,

LIEUTENANTS UNITED STATES NAVY.

PART II.

BY LT. LARDNER GIBBON.

WASHINGTON:
A. O. P. NICHOLSON, PUBLIC PRINTER.
1854.

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MESSAGE FROM THE PRESIDENT OF THE UNITED STATES,

TRANSMITTING

THE SECOND PART OF LIEUTENANT HERNDON'S REPORT OF THE EXPLORATION OF THE VALLEY OF THE AMAZON.

JANUARY 6, 1854.—*Resolved*, That there be printed, for the use of the members of the House, ten thousand extra copies of the report of the Secretary of the Navy communicating the reports of the exploration of the river Amazon and its tributaries, made by Lieutenants Herndon and Gibbon, with the accompanying maps and plates.

APRIL 13, 1854.—*Resolved*, That there be printed twenty thousand additional copies of the reports of the surveys and explorations of the river Amazon, with the plates and maps accompanying, by Lieutenants Herndon and Gibbon—two hundred and fifty copies for distribution by Lieutenant Herndon, and two hundred and fifty copies by Lieutenant Gibbon, and the remainder for the use of the members of the House.

To the Senate and House of Representatives:

I herewith transmit a communication from the Secretary of the Navy, accompanied by the second part of Lieut. Herndon's Report of the Exploration of the Valley of the Amazon and its tributaries, made by him, in connexion with Lieut. Lardner Gibbon, under instructions from the Navy Department.

FRANKLIN PIERCE.

WASHINGTON, *February* 10, 1854.

NAVY DEPARTMENT, *February* 10, 1854.

To the PRESIDENT.

SIR: In compliance with the notice heretofore given and communicated to Congress at its last session, I have the honor herewith to transmit the second part of the Report of the "Exploration of the Valley of the Amazon, made under the direction of the Navy Department, by William Lewis Herndon and Lardner Gibbon, lieutenants of the United States navy."

The first part of the exploration referred to was transmitted to Congress by the Executive on the 9th of February, 1853, and has been printed. (See "Senate Executive No. 36, 32d Congress, 2d session.") The second part, which completes the report, is the result of the labors of Lieutenant Lardner Gibbon, after his separation at Tarma, on the 20th June, 1851, from Lieutenant Herndon, the senior officer of the exploring party.

I have the honor to be, with the highest consideration, your obedient servant,

J. C. DOBBIN.

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WASHINGTON, D. C., *February* 7, 1854.

SIR: I have the honor to submit, herewith, a report of an exploration of the countries drained by certain tributaries of the Amazon, made by Lieutenant Gibbon during the years 1851–'52.

It will be recollected by the department that, at Tarma, in Peru, I divided my party, and confided a portion of it to Mr. Gibbon's direction. This report is the result of Mr. Gibbon's labors consequent upon that division, and will form Part II of the "Exploration of the Valley of the Amazon."

I have the honor to be, very respectfully, your obedient servant,

WM. LEWIS HERNDON,
Lieutenant U. S. Navy.

Hon. JAMES C. DOBBIN,
Secretary of the Navy, Washington.

WASHINGTON, D. C., *January* 25, 1854.

SIR: By instructions, a report, accompanied by maps and sketches of scenery in South Peru, Bolivia, and Madeira river, in Brazil, made by me to the Navy Department, is herewith submitted.

Very respectfully, your obedient servant,

LARDNER GIBBON,
Lieutenant U. S. Navy.

Lieut. WILLIAM L. HERNDON, *U. S. N.*,
Commanding Amazon Exploring Expedition, Washington.

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PREFACE.

WASHINGTON CITY, *January* 25, 1854.

SIR: A Passed Midshipman, suddenly drawn from duty at the National Observatory, in Washington, to enter upon an exploration of distant lands and rivers, among strange and divers people, will not be expected to furnish a polished report of observations made under many disadvantages.

In revising notes, hastily scribbled upon a mule's back, on mountains, or in a canoe, the writer has endeavored to present familiar images of the objects he saw, as they impressed him at the time, leaving intelligent readers to draw their own conclusions from his facts, or the best information he could gain from reliable sources on the route.

The statesman, the planter, the merchant, the farmer, the manufacturer, or the artisan, can estimate, from every-day occurrences, in what manner habits and customs of inhabitants of the southern continent, or productions of its climates, lands, rivers, forests, and mines, may advantage the industry or promote the enterprise of the people of the United States of North America.

Being limited by instructions, the writer commences his observations at the division of the naval party at Tarma, in Peru, and closes them on reaching the mouth of the Madeira river, in Brazil.

Descriptions of fishes collected from snow-water lakes and streams in Peru or Bolivia, and from rivers in Brazil, botanical specimens, varieties of birds, different ores, earth, and metals procured on the journey, are unavoidably omitted.

Very respectfully, your obedient servant,

LARDNER GIBBON,
Lieutenant U. S. Navy.

Hon. JAMES C. DOBBIN,
Secretary of the Navy, Washington.

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CHAPTER I.

Tarma—Inca road—Juaga valley—Quichua Indians—Trade—Juaja river—Snow mountains—Stone bridge and stone coal—Temperature of springs—Llamas—Lieutenant of police—Quicksilver mines of Huancavelica—Wool growing—Molina Posta, or country tavern—Silver mines of Castro—Virreyna—Population of Huancavelica—Its mineral productions—Sand-stone pyramids—Chicha and chupe—A New-Englander among the Andes—Fruits and flowers of Huanta—Blacksmiths.

Tarma, a small town in Peru, by alpha and beta, Centauri, in latitude 11° 25′ south, is situated in a rich, well-cultivated, narrow valley, between the Andes range of mountains on the east, and the lofty Cordillera chain on the west.

On the 9th of July 1851, the writer turned southeast, accompanied by Henry C. Richards, a native of Virginia, in the United States, and José Casas, of Spanish descent, native of Peru.

A volunteer mestizo, Arriero, with his little son, drove a train of mules which carried the baggage.

Our path was shaded by willow trees, and the way obstructed with droves of llamas, loaded with rock salt from mines in the neighborhood.

The leaves of the trees seemed calling for water, while the temperature of the air, at mid-day, in the shade, was 68° Fahrenheit. Peach and apple-tree leaves doubled up, showing both their edges to the sun; the fruit is small, oblong, and unthrifty-looking.

The ravine through which we ascend is thickly populated with Quichua Indians. Their houses are built of stone and mud, and thatched with coarse mountain grasses.

The natives are busily employed gathering in the harvest of maize, which is small-grained and of four colors, red, white, yellow, and blue. It is of excellent quality, generally used as food, roasted or parched.

Potatoes, of which there are numerous varieties, are also now gathered; they grow in perfection, though much smaller than their descendants in the United States.

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The little estates—chacrás—are owned by descendants of Spaniards, Indians, or Mestizos, the latter a cross between the two former.

In almost all cases the cultivation of the soil is performed by the aborigines, at wages from ten to twenty cents a day.

As we rise above the foliage, the mountain tops begin to look wild and barren, with rocks and red clay; below we have a beautiful view of the town of Tarma, amidst its green trees and pasture fields. My mule, Rose, pants for breath; she is so fat and plump that the climbing troubles her.

On the mountain-side is seated a fine looking Indian, blowing a semi-circular shaped trumpet, made of a number of cow's horns, stripped one into the other, with the joints sealed; he don't seem to be so particular as to the tune, as he does to the distance he may be heard, and he makes the valley ring. José thinks he is trying to blow up a wedding with a fair one among the flowers below. The Indians celebrate harvest-time with merry-making. Their meals are cooked in the fields, where their kitchen utensils are carried. They have music and dancing in the barley stubble. It is amusing to see these happy people enjoying themselves in the open air. As we pass, the reapers are seated near the road, in a barley field, at dinner, upon the ground, in rows one behind another, laughing and talking among themselves. When we meet them they are very civil, modest, and unassuming in manners. The men carry enormous loads of barley or wheat on their backs, while the women drive the loaded ass, and sling the children over their own shoulders. Their horses, mules, sheep, horned cattle, pigs, and dogs, are all admitted, together with the family, into the harvest field; while the father reaps, and the mother gathers, the boys tend the flocks, and the older girls take care of the babies and do the cooking, while at the same time they spin woollen yarn by hand, for stockings. One of them offered a pair for sale at twenty-five cents, which were nearly long enough for trowsers. They are always employed, go to bed early, and rise beforethe sun, as their Incas taught them to do.

At the top of the mountain, not a house or tree was to be seen, and no sign of cultivation. On tufts of coarse mountain grass, a flock of sheep were grazing; some of them merinos, and of good size. Their wool is sent to Lima, where it is sold, to be exported around Cape Horn, to the manufacturers in the North.

To the east is a snow-peaked mountain, and as the moon rises, as if from the Atlantic ocean, we are followed by a cold north wind. The sky is clear and of a deep blue. On our left we see the remains of an ancient Peruvian road, used in the times of the Incas. It is said that *good* roads are marks of civilization; could my mule, Rose, give her

opinion, she would certainly decide in favor of the Inca road, in preference to those found in Peru at the present time. These remains show a width of thirty feet of rock pavement, with well placed curbstones on each side. Where the road has considerable inclination, rows of stone are placed across, higher than the general level of the pavement, so that it appears like a stair-way on the side of a hill. That it was not a coach road is no argument against it; it was before the horse, the ass, or the cow were introduced into South America from Europe. It was constructed for the Indian and his llama, the surest of the sure-footed, and, therefore, the improvement speaks well for the civilization of those times of which we have but a traditionary record.

Passing over a plain on the mountain top, there was a cistern by the side of our path, where water is caught during the rainy season to supply the thirsty in the dry. The rainy season commences here about the middle of September—sometimes later—and lasts six months. The remainder of the year is dry.

Night had overtaken us where not a living thing was to be seen, except a black eagle, returning to its roosting-place under overhanging rocks, on the west side of a lofty peak. Our little tent was pitched; the baggage piled up and covered at the door; the mules let free for the night to feed upon the mountain grass around us. A fire was kindled, and water from a small spring heated, and tea was made. José produced bread and cheese from his saddle-wallets; placed them upon a clean cloth over a trunk; looking into the tent, he says, very slowly, "*Señor! La hora de cenar*," (Sir, it is the supper hour.) Both men and beasts seem tired; we have ascended all day. The first day's travel is always the most harassing. Our arriero, Francisco, a mestizo, is a small, slim built man, with respectful manners; he and his little son Ignacio keep watch by turns over the mules. The little boy is out while his father gets supper. The night was clear and cold; the moon shining brightly. The world is not so silent in the middle of the ocean. I do not think I heard anything; I almost listened to hear the globe turn upon its axis. Long after the people were asleep, I heard little Ignacio singing to himself, wrapped up in his homespun poncho, as he follows the mules.

At daylight in the morning we found heavy frosts and ice about us, with thermometer 24°, and wet bulb 30°. The mules were loaded; breakfast over; observations made; and we off, soon after sunrise. This is the way to travel at an elevation where we find no inhabitants.

The mountains are becoming more rounding, aud covered with a fine sort of grass. Shepherdesses are following thousands of sheep and lambs.

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The girls spin wool and chat together, while the dogs follow lazily after. If we pass close to the flock, and the sheep run back, these dogs make a furious attack upon us, keeping between us and the flock. The temperature of a spring of excellent water near the path was 48°. To the southeast snow peaks stand up in full view. The day is warm and pleasant. Here comes a cheerful party of ladies and gentlemen on horseback. As we pass each other, the gentlemen take off their hats, and the ladies look prettily under their white straw ones. Their figures show to advantage in riding-dresses, and they manage and set their horses well. The cool mountain air gives them a fresh color, which contrasts well with gazelle-eyed beauty and long black hair. I thought their dresses rather short, but a sight of the foot of one of them, small as it was, reminds one there is proof positive against the propriety of a man's travelling through this world alone.

Now we meet the market Indian driving asses loaded with potatoes, corn, and saddles of mutton, to Tarma. I wanted some mutton for the party, but José was positively refused by an old woman, who got out of his way by twisting the tail of her donkey, who was disposed to come to a stand and be relieved of his load. I was told Indians scarcely ever sell except after they arrive in the plaza. I can account for it by the woman's wanting to go to town, for José offered her more than the market price.

At the end of a thickly populated valley, which stretches off to the southeast, we halted at an Indian hut for dinner. The wife was at home with her children—fine, healthy-looking little ones. Boiled mutton, potatoes, and eggs, with good wheat bread, were placed upon the ground at the door. The children and dogs formed an outside circle around us. After dinner the woman gave me an orange, which she said came from the woods, pointing to the Andes, to the east of us. Some of these Indians cross the range of mountains, and garden on the eastern slopes for the markets, on these table lands—*Puna*—as the Spaniards call the elevated flats.

The husband was threshing barley with his neighbors. The grain is separated from the straw by the tramping of oxen and horses. Over the surface of this level valley there are numbers of such threshing parties. The grain is cleared from the chaff by being poured from the top of a man's head on a windy day. Many of them suffer with inflamed eyes, and even lose them sometimes by a shift of wind, which blows the barley beards into the eyes.

Black cattle are numerous here, and at the foot of the mountains; so are white churches, which stand in the midst of a thick population of

Indians. We met a number of tax-gatherers, going among the threshers, with silver-headed canes, receiving a measure of grain instead of contribution-money. They are old Indians, very well dressed, with a respectable, quaker-like air about them; broad-brimmed hats and standing collars. It is an active time also with the priests, who go abroad among the farmers for tithes. The valley is all activity, and merry are the people. Women are visiting about from place to place, astride of plump little jackasses. This is a plentiful season.

When the crops fail on these table lands, the suffering among the Indians is very great. Seeding time is in September, just before the rains commence. If there are hard frosts in February, the chances are that a famine follows.

Crossing a small ridge on the east, we came in full view of the great valley of Juaja, stretching away south. The snowy peaks are represented in a sketch from our camp near the town.

José's wife and children came to the tent, brought *us* supper, and lucerne for our mules. One of the sons, a fine-looking boy of eighteen, volunteered to go with me. José desired that I should let him go, and I had no objection; but when his mother came to ask me if I was not satisfied to take her husband without taking her son and only protector, I referred José and her son to her. She settled the case her own way, and gave me her blessing.

Juaja has a population of about 2,500 inhabitants. I say *about*, because there is no such thing as a census known at this elevation. The houses are built one story, of adobe walls, or of unburnt bricks, and tile roofs. The streets are well paved, and run at right angles with each other. A pretty little white-washed church stands upon the plaza, where the women sell their marketing and say their prayers. The Indians come to market and church at the same time; Sunday morning is the great market day. A drove of horses are most miserable-looking little rats; the horses of the lowlands and coasts are much their superiors.

Men live to a good old age in this climate; 70, 80, and 90 years are common; some have arrived at 120 and 130. I am under the impression that the Indians live longest. Mestizo and Spanish Creole girls have been known to bear children at 8 and 9 years of age.

The Spanish Creole population is small; they are generally shopkeepers, the only dealers in foreign goods, which are retailed to the Indians at enormous profits. They travel to Lima and purchase goods, which they use as an inducement to the Indians to work the silver mines, existing three leagues to the east of Juaja, in the Andes range,

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but which at present are little worked. The Indians prefer blue, in their dresses, to any other color, and consume considerable quantities of indigo. The demand for wax in the churches is of some account. Eggs and wool are the principal exports to Lima, and are carried over the Cordilleras on the backs of jackasses. Travellers do not know why they meet with so many bad eggs at breakfast in Lima. It is customary to pass them round the country as current money or coin for some time before they are sent to the coast to be eaten. Mrs. José says, three eggs will buy her a glass of brandy, or sixpence worth of anything in market. The carrying trade is superintended by the Indians.

The mestizos are shoemakers, blacksmiths, and saddlers. They seem fond of music and dancing, and assume the pride of a superior, and lord it over the honest Indian.

Our road lies through a rich valley, often four miles wide, and level as a floor. The mountains on both sides are dry and unproductive, except in the ravines. The half-yearly displacement of earth is very great; during the rainy season the mountain torrents come down from the summit loaded with soil. The decrease in the size of the mountains from the time of their creation to the present day, and the filling up of this basin, naturally leads one to wonder, whether the present valley was not once a lake. The Juaja river, which takes its rise in Lake Chinchaycocha to the north of Tarma, flows sluggishly and serpent-like through the whole length of the valley, and creeping through the Andes, suddenly rushes off at a rapid rate, as though sensible of its long journey, by the Ucayali and Amazon, to the Atlantic ocean. The bed of the river is half a mile wide, and in the wet season is probably eighteen feet deep. There is very little water in it now. The banks break down perpendicularly. The growth of small trees and flowers gives a fresh appearance to the valley, but the sun is very warm as we pace along the dusty road. The apple trees are about the size of raspberry bushes.

There are few varieties of birds in the valley; some pigeons and doves keep the table pretty well supplied. Little Ignacio takes great interest in the sport, and his sharp eyes are constantly on the look-out for a shot. By the river snipe are found; among the flowers, the humming bird is seen and heard.

The road crosses a number of dry beds, streams of considerable size in the rainy season. There is only water enough, at present, for the washwomen, whose soap-suds spoil the water for our beasts. We pass through the village of San Lorenzo, and the small town of Concepcion. A death-like silence pervades these places; the people are in the fields, except some creoles, seated among the flowers in their neat little court

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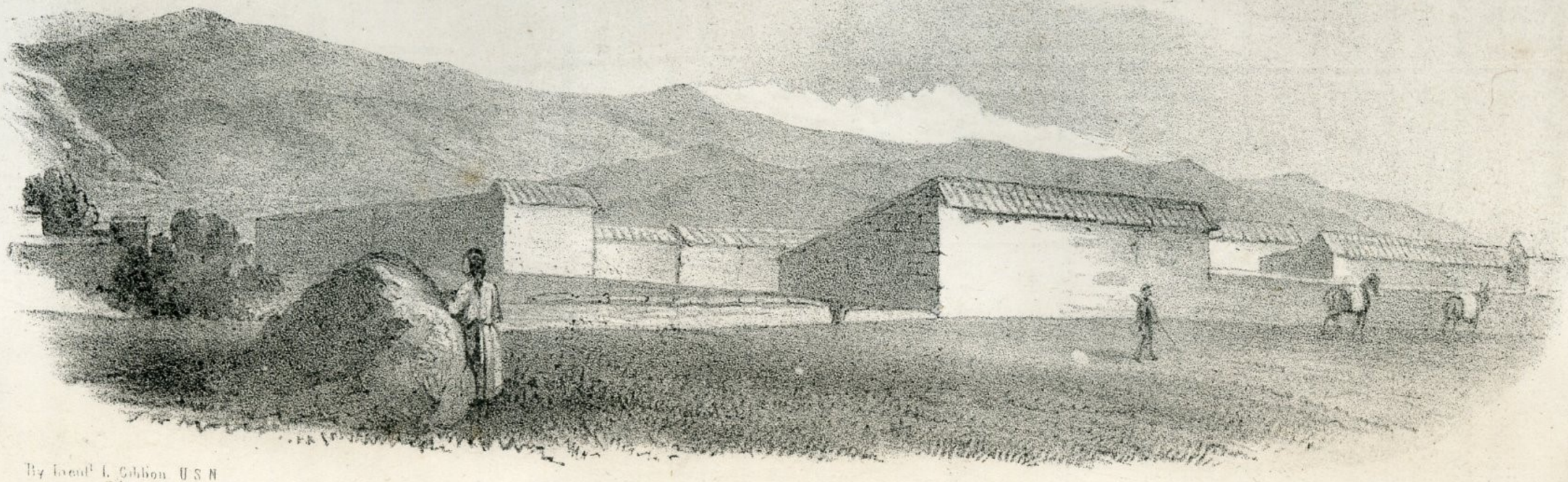

By Lieut. L. Gibbon U.S.N.

Lith. of P. S. Duval [illegible]

VIEW TO THE EAST OF JUAJA Peru.

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yards. The streets are narrow and the houses small. All the towns of the Puna are built pretty much after the same fashion, and of the same material; the only difference in their outward appearance being produced by the cultivation of foliage and flowers, where the soil and climate permit. When this is not the case, the town presents a stupid, uninteresting aspect. Children, dogs, and pigs, earthen pots, and beds of straw, surround a smoking fire on the ground floor of a one-roomed house. The smoke escapes through the door-way; the only opening for light or a change of air. During storms, or at night, the door is closed. One peep inside satisfies the North American he can find no rest *there*. But here, in the valley, the cooking is done under the trees, and the inmates of the house wander out in the shade. We have often noticed expressions of friendship between children and dogs; the latter shows his pleasure by wagging its tail, while the smiling child pulls his ears. The pig is the most restless creature at this height. While by himself, he is seen tossing up the bottom of the valley; when he sees the child and dog together, he gives a corkscrew motion to his tail, jumps and swings his body about with an inviting grunt to play. Before long he is laying on his side, with the child on top of him, while the dog is pawing and snapping at that laughable twist of the tail. The affection the different species of animals have, in these associations, is remarkable. The dog in any other place will sometimes kill and eat the sheep; here, he protects it by night and by day. The pig forms an attachment to the jackass, who leaves it, at this season of the year, for the female of its own kind. The ram becomes intimate with a horse or a bull, and it is with difficulty they can be separated. The lamb follows the Indian girl in direct disobedience of its mother's call. Domestic cats are few. They cannot live on high elevations.

There is no part of Peru which is more densely populated than the valley of Juaja. There, close under the mountains, on the east side stands the town of Ocopa, with its convents and schools. From that place, missionaries have branched off in different directions to the forests in the east, at great risk of life and loss of all its comforts, to teach the savage red man how to change his manners, customs, and belief. Some have succeeded, others have failed, and were murdered or driven back by the battle-axe; their settlements destroyed by fire, and years of labor lost; yet some never tire!

Ignacio carries our tent pole across the pummel of his saddle. His thirsty mule ran between two others, loaded with baggage. The boy was swept off and dropped over the creature's heels in the middle of the stream. He regained his saddle in a short time. His father laughed at him, and took the pole himself.

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In the centre of the valley are the remains of an ancient city; the ruins of stone walls were 12 feet high, and from 1 to 1½ foot thick. Those of the present day are generally adobe, from 3 to 4 feet thick. Some of the buildings have been round; others oblong, but generally square, 12 by 18 feet. The round ones are largest and best situated. The streets very irregular and narrow; no appearance of plaza, or church. The ruins extend half a mile north and south, and 200 yards east and west, on a knoll, which may have been an island before the Inca road was built, now hedged in on both sides with cactus. As the land about this ancient city is now cultivated as a corn-field, no remains of curious things could be found. The mason-work is very rough, but remains of mortar are there. How the houses were roofed is doubtful, but by the slanting down on the inner sides of the stones of those houses which were round, the mason work may have been carried up till it met at a point, which would give the house a sugar-loaf shape. Besides doorways, there were window openings.

Droves of jackasses pass, loaded with small raw-hide bags filled with quicksilver from the mines of Huancavelica, on their way to the silver mines of Cerro de Pasco.

On Saturday evening, July 12, 1851, we encamped on the south side of the town of Huancayo, and remained till Monday morning, giving the party their usual day of rest. Upon entering this town we saw the first signs of improvement in the construction of a stone bridge; the mason work compares well with that of more flourishing places. The men and cows of this place are larger than any we have seen. The people are very polite. The Indians oblige us with all we require, and seem interested in our industry. José asks permission to go to church, and for money to buy shoes. The singing of frogs reminds us of home. Some of the trees are much larger than those hitherto passed.

Marks of small-pox are seen among the people; but there are no chills and fevers here. Some of the women have dreadful swellings in their necks, called by them "*cota*," or goitre, caused by drinking bad water, or snow-water deprived of salts. But why this disease is generally confined to the women I cannot say, unless the men never drink water. It was very certain, from the noise after church, that they find something stronger. I do not think the people are generally dissipated, except on Sunday afternoons, when both sexes seem disposed to frolic. During the week they are otherwise employed.

Leaving the Juaja valley, we passed through a rough, hilly country. In barley stubbles ewes are giving lambs.

A woman planting beans after the plough, has her baby slung over

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By Lieut.L.Gibbon U.S.N.

Lith of P.S.Duval & C° Phil.

ENCAMPED NEAR HUANCAYO, VALLEY OF JUAJA, Peru.

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her shoulders; by the noise it made, I doubt its partiality to beans. The plough is drawn by oxen, yoked by the horns. It is made of two pieces of wood—the handle and coulter are of one piece, into which is jointed the beam; the coulter is shod with a square plate of iron, without a shear, so that the furrow is made by throwing the soil on both sides, like the North Carolina bull-tongue. On a hill some Indians are planting, while others are carrying up water in large jars from a stream for the purpose of irrigating the vegetables peeping out of the ground.

Some of the Indians on the road look very sad after their Sunday frolic. A man on horseback, with his wife astride behind him, and her baby slung to her back, looked quite as uncomfortable as his miserable little horse. The road is marked with stones at every league of three miles: some of the measures must have been made on a Monday morning after a frolic. The small towns of Guayocachi and Nahuinpacyo are inhabited solely by Indians, and have a ruinous appearance. The streets are pasture-grounds, and decayed old houses serve as roosting-places for buzzards. We had thunder, rain, and hail; the hail-stones as large as peas, and soft, like snow-balls. Lightning flashed all around us in the valley, while the black clouds brought up by the southeast winds were hurried back by a heavy northwest squall. Thermometer 45°.

The Indians gather the dung of animals for fuel. Wood is too scarce to burn here. The green waters of the Juaja rush down through deep ravines; its power is used for a flour mill. The grain is mashed. The branches of a few large cedar trees give shade to the door of the polite old mestizo miller. Descending the river, we came to a beautiful white-washed new stone bridge, with one arch, 30 feet above the stream. Paying a toll of one shilling per mule, we crossed the Juaja into the small town of Iscuchaca. Near the river there are patches of lucerne, and peach trees in blossom. A native of Copenhagen, in Denmark, came forward and invited us to his house. The people had told him his countrymen had arrived. He was silversmith and apothecary, but had been employed by the Peruvian government to construct this beautiful stone bridge, which he had finished, and married the first pretty girl on the street leading therefrom, the daughter of a retired officer of the Peruvian army. The bridge across this stream was formerly built of wood. During a revolution, one of the parties set it on fire to the stone foundation. The Copenhagen man gathered a quantity of this stone, made a fire of it in his forge, and heated a piece of iron red hot. He called it brown slate coal; rather hard; not good for blacksmith's work; but the same is used for running an engine at the mines of Castro-Virreyna, in which he is interested. There are thermal springs

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near; and specimens of magnetic iron were collected from a mountain 1½ league to the northeast of the town. The "Matico" bush is found here. Many stories are told of the effects of this medicinal plant, which has been in use as a tea among the Indians, and as a poultice for wounds.

Iscuchaca is pleasantly situated amidst wild mountains, which seem to lock it up. The Juaja winds its way towards the Atlantic, while we climb a steep towards the Pacific.

The water of a rapid stream is somewhat salt, and its temperature 50°, while the air was 65°. Many fine mules are dashing down the narrow road. The drover tells me he is from Içа, bound to the Cerro Pasco mines, where he trades mules for silver. Içа is situated inland from Pisco, on the coast.

Among the mountains, at the top of a dangerous and precipitate pass, there is a wooden cross, erected by the people in the neighborhood. Travellers universally take off their hats as they pass, praying for a safe passage, or feeling thankful for one. The women often decorate these emblems with wreaths of flowers, cross themselves devoutly, and pass on. José begged me to hang the mountain barometer to one arm of the cross. While I took the reading of it, he looked on in great admiration.

The small Indian town of Guando is the first we have seen built of stone. It is situated high up on the mountains, and presents a most dilapidated appearance. On one side of a narrow street, little school boys were seated, saying their lessons to the teachers, who were on the opposite side. As we passed between them, the boys all rose and bowed politely. Among the inhabitants were an unusual number of elderly women. The temptation was great to ask their ages; but as some dislike questions of that sort, I might make an enemy without getting a fact. An Indian hut in the valley sketches the inhabitants. José appears between the man and his wife, telling them, in the Quichua language, that I live far off to the north, and want to show the people there what kind of people are here. The old Indian chews an extra quantity of coca leaf. The woman looks astonished, and the child is disgusted, though all stand still *as they are told*. The man was employed threshing barley with a long pole. The woman was cooking, and the child playing with the dog, when we arrived. The nights are very cold, the days warm and pleasant. To a church and few houses near the road has been given the name of Acobambilla. The Indians around answer the bells to prayers.

We ascend the top of the mountain and see perpetual snow in all

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By Lieut L. Gibbon. U S N

Lith. of P.S. Duval & Co. Philad.ª

QUICHUA INDIAN FAMILY AND HUT. Peru.

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directions, overhung with heavy, black, cumulus clouds, above which the cirrus shoot upwards; in the zenith the sky is clear and of the deepest blue. Spring water 44°; air 45°.

Richards shot at four wild geese with his carbine and single ball; two of the geese flew off, leaving the others very much frightened. The geese flew across a small snow-water lake. These birds are white, the ends of wing and tail being black, with red bills and legs, as large as the domestic goose, though not so tender. Tadpoles, but no fish, were to be seen. Wild ducks kept at a distance. The llama is pasturing and giving birth to its young close under the perpetual snow line. The alpaca and huanacos—species of the llama—are in numbers also. Llamas occupy the useful position among the aboriginal race of South America, that the camel does to the wandering man in Arabia. These animals carry loads of one hundred pounds, over roads too dangerous for the mule or the ass, and climb mountains difficult for man. They are principally used for conveying silver from the mines. The Indians are very fond of them; though they drive them with a whip, it is seldom used; when one lags behind or lies down on the road, the Indian talks to it, and persuades it to forget its fatigues and get up again. They hang little bells about their graceful necks, and decorate the tips of their ears with bits of colored ribbon. Their disposition, like those of their masters, are gentle and inoffensive, except when too much hurried; then they cast saliva at the Indians, or at each other; this is their only offence; it is thought to be poisonous. They require very little food, which they pick up on the mountains, and are much more temperate than their drivers; they require very little water. Their loads are taken off at mid-day, so that they may feed. I am told that they never eat at night. They seek the cold regions of the Andes; nature has provided them with a warm fleece of wool, and they need no shelter. Though they are feeble animals, their usual daily travel is about 15 miles; but after three or four days journey, they must have rest or they perish on the road. The motion of the head and neck as they cross the mountain crags may be likened to that of the swan, as it floats over smooth water. The wool makes good coarse cloth, of various colors, seldom all of one color. The huanaco is known by its being rather larger than the llama; it is said to be difficult to train, even if taken young. It never gives up its ideas of liberty, and will regain its companions whenever an opportunity admits.

The alpaca is the smallest, with the finest long wool; its body resembles the sheep, with the head and neck of the llama. José tells me they are

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good to eat, but like the others the meat is not very palatable. The alpaca wool is well known in the markets; the Indians make clothing of it, and trade it off on the coast. In this department, and further south, great numbers of these new world camels are raised. It has been remarked that they seek the south side of the mountains; probably there is less evaporation than on the north side, and the pasture is more fresh and inviting. Barley is generally raised on the north side of the mountain.

After a long and tiresome descent we halted in the main plaza of the town of Huancavelica, in front of a small shop on the corner. Drawing out a letter of introduction to the owner of the house, given to me by his friend, my Copenhagen "countryman," I handed it to a very pretty young woman, seated in the doorway, sewing. She invited me in, and I followed to the bed-room of her husband, who was napping. There were so many female dresses hanging around I was obliged to be seated on the bed. The husband shook hands, rubbed his eyes, gaped, and then laughed. He said he was very glad to see me, that everything in the house was mine. Our baggage was put into a room, and preparations at once made for dinner. While I was resting, an officer, with a gold-laced cap, gray trowsers, and a half-buttoned military jacket, came in, and inquired from whence I came, and as he was a lieutenant of police, he would thank me to show him my passport. In return I inquired, whether, in his opinion, the world was not sufficiently civilized to permit people to pass without such documents. It is very certain the lieutenant never had such a question put to him before. I told him to call when my baggage was unpacked, but I never saw him again, though I heard that Don ——— had said, "North Americans required different treatment from those of some other parts of the world; *they* did not know what passports meant, notwithstanding they were a very intelligent people!"

Don ——— keeps a gambling house, where hot coffee and ice cream may be had by applying at the shop, attended by his pretty little wife. All the ladies in town visit in the evening to refresh themselves after promenade, while the Spanish Creoles spend their time at a game called "Monte," until day-light in the morning. This is a hotel, so far as eating and drinking goes, and the only house of the kind in the town kept by a Spaniard. The house was established after the marriage of the young couple, and is thought a good business, though the bride may be disgusted with her laborious life, even amidst so much ice cream, during the honey-moon.

The town of Huancavelica has a population of about 8,000, and is

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By Lieut.ᵗ L. Gibbon. U.S.N.

Lith. of D.S.Duval & Co. Phil.ᵃ

ALPACAS ON THE CORDILLERAS NEAR HUANCAVELICA. Peru.

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situated in a deep ravine, amidst a cluster of lofty peaks. It is the capital of the department, and was named by the Incas. The ravine runs east and west, with an average width of one mile. A small stream flows through it to the east. Thermal springs, of 82° Fahrenheit, found in the vicinity. The town is divided into two parishes; counts six churches, a hospital, and college for young men, in which physics, chemistry, and mineralogy are taught. The plaza is adorned with a fountain of stone. A cathedral stands by the side of the mountain of Cinnebar, which contains the celebrated quicksilver mine of Santa Barbara. Climbing up this mountain, we came to a door-way 15 feet high and 12 wide, carved in the sand-stone. The entrance on the southwest side of the peak was like a railroad tunnel. The eternal glaciers are at this door-way. Icicles hung overhead, and sheets of ice spread under our feet. Sooty-faced, rough-looking Indians trundled wheelbarrows loaded with quicksilver ore. As the *administrador*, a tall, smallpox-marked mestizo, said to me—We are all ready, sir, to escort you through the mines of Huancavelica—I felt as though he was going to say, to be buried alive. We entered this dark hole, about 600 feet below the top of the mountain. As we left daylight, I thought of home; then I heard a dreadful crash, which the mestizo informed me was the upper part of the mine falling in. A hollow sound was followed by a splash in the deep waters somewhere below; then came suddenly a strong smell of sulphuret of arsenic. A little further on I saw a pair of eyes through the darkness. I called to Richards to hold his torchlight; we were travelling east-northeast by my compass; the eyes belonged to a little Indian boy standing on the side of the mine, with a load of ore on his back, while we passed; he had come through a narrow passage called "Take off your horns," on his hands and knees, and had raised a choking dust. After refreshing ourselves at a spring of water of 50° temperature, we passed into a plaza, where the market women sell to those men who seldom leave the mines. On one side of this plaza, by holding the torches over our heads, we see a beautiful bridge, and beyond it a stairway leading into utter darkness; on the other side a lake—the opposite shore not in sight, though the sound of a hammer floats over its smooth water. As we move along among red brick-colored columns, which support the immense weight overhead, we see a dim torch by the side of the workman, seated with his hammer and chisel, cutting away and honey-combing the Andes. The *administrador* tells me we are half way through; if I wish to climb up stairs, we can get near the peak. Turn which way we will, we find a road to travel. I told him to be pleased to keep as near a level as possible. He

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halted, and after some words to the Indian guide, he said he had taken the wrong road, and must go back some distance. After bumping our heads, and walking doubled up in a most tiresome position, with great want of fresh air, we finally stood up in the San Rosario church, which is rotundo-shaped, with a height of 100 feet to the ceiling. Over the altar was carved, in solid cinnebar, the Virgin Mary, with the Infant in her arms. As the Indians pass, with hat in hand, they turn, and, kneeling under their heavy loads of ore, say a short prayer, cross themselves, and pass on by the light always burning at the altar. The laboring Indian, who seldom leaves these dark regions, attends when the church bell calls, and offers up prayer for protection from the dangers of the mine. On a Sunday evening, in this rotundo, he meets his countrymen, who work on the opposite side of the lake; they tell of seeing daylight at the point of the chisel overhead, instead of driving it farther towards the bowels of the earth.

After a walk of two hours we came into the fresh air on the north side of the mountain. The Cinnebar is so narrowly separated by layers of sandstone, that the peak may almost be called a solid mass of quicksilver ore. At present there are 120 Indian men, women, and boys employed in extracting the metal. Those who cut out the ore work very much as they please—that is, they cut without compass; this makes it dangerous to those inside, the proper supports being cut away by the ignorant Indian. The ore is carried out at both sides of the peak, in bags of raw hide, slung over the backs of the boys, and then wheeled to the furnaces near by, where men break it up into bits, and women make small cakes of the dust. These cakes are laid in the bottom of a large iron grate, sufficiently open to allow heat to pass, and over them the ore is filled in to the depth of three feet. A fire is made underneath of coarse mountain grass; a strong draught carries the vapor from the heated cinnebar, through a retort of earthern pipes, slipped one into the other, to a distance of five or six feet, where it condenses, and the quicksilver lodges in the floor. After the ore becomes well heated, which generally takes eight or ten hours, the doors of the furnace are closed, and, for three or four hours, the distillation continues. After this the quicksilver is swept into pots, washed in water, and dried, when it is ready for the market, and is sold here at one dollar per pound. It is sent off in all directions to the silver mines of Peru.

By the rude method of mining and smelting, the loss of mercury is great. The joints of the earthern pipes are luted with clay, through which the vapor escapes before it has time to condense. It is difficult to regulate the heat by the dry mountain grass, which blazes up and

passes away in a moment, so that the doors must be kept open, and a man constantly feeding the fire.

The mine is owned by the government, and leased to a company, who keep secret its annual yield. The laborers' wages are never more than fifty cents a day. They are supplied by the company with all they require from the shop—a sort of purser's store-room—altogether a profitable business for the company. It often happens that when the day of reckoning comes, the laborer is in debt on the books of his employer; he is then obliged to return to the mine and work.

Cinnebar is said to be found the distance of ten leagues, in all directions, from Santa Barbara, and that the Incas knew of and made use of it. Remains of small ovens, in the shape of retorts, have been discovered. The Indians used it to paint their faces.

The only account found of the annual yield of this celebrated mine was from 1570 to 1790; during this 220 years, Santa Barbara produced 1,040,469 quintals (100 pounds) of quicksilver, or an average of 47,294 pounds per annum. The price during this period varied from fifty to one hundred dollars per quintal, according to the tariff of prices fixed by the Spanish crown.

Huancavelica is on the inland route between Lima and Cuzco, distant from the former 73 leagues. This, although not the shortest distance to the coast, is yet the best road at the present day, leading to the best seaport. Of this immense mass of cinnebar, not a pound is exported. England finds a market for other quicksilver in the silver mines of Peru; carried in iron jars around Cape Horn at great expense, it is transported on the backs of mules, almost by the very mouth of Santa Barbara. The roads are very narrow and rough; it would be impossible to draw a piece of artillery over them in their present condition; a piano was brought from Lima to Huancavelica, and remains cracked to this time, though the house containing it is the centre of gayety and attraction; the owner expects the music of "The last rose of summer" by the next train of mules. Cargoes arrive from Lima in ten days; mail-boxes, on a mule, travel the distance in six days. To Iça, 50 leagues; cargoes take eight days.

There are no foreigners in Huancavelica. Creole families are few, and the Indian population very poor. Its vegetable productions are raised in this cold ravine; the inhabitants, generally, keep in doors; almost all the Spanish creoles have been to Lima on visits, or educated there, and possess a gay, agreeable manner, and make the cold dreary evenings pass off pleasantly. They have no fires in their houses; as a substitute, they play romping games, and under the exercise keep comfortable until

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bed time. This was decidedly a merry way of bringing families together, and pleasing to see old folk's romping, like children, with the young people. On one such occasion, a corpulent gentleman had his thumb put out of joint; a pretty girl held the end of it, while others pulled it in place again—by his coat-tails. One of the games is somewhat like "hunt the slipper." All the players stand up in the middle of the room, and carry on to the music of a guitar, violin, or flute. The houses are tolerably well furnished and carpeted. The Indians act the part of servants. They are taken when young, grow up with the children, and frequently remain all their lives in the family; others run away when they become of age, or whenever they are dissatisfied. The Indian girls are often very much attached to their employers, and make cooks and house servants; remarkably neat in their dress, which is not unlike the bloomer style. People wear thick cloth here, even in the house; it is unusual to see ladies without shawls, or gentlemen without cloaks or overcoats. The only fuel known is mountain grass, and dried droppings of llama, like what our hunters call "Buffalo chips."

The Prefect of the department was very kind and attentive. He gave me passports for all the lieutenants of police in South Peru, and called upon them as good citizens to assist me; besides, he offered me private letters of introduction to his friends on my route. He expressed the opinion that Mr. Gibbon was probably going to Carabaya, for the purpose of ascertaining whether the gold there was not "the other end of the California vein." I paid off Francisco and his little son Ignacio, when they returned home. Here we take regular post mules and new arrieros, or mule drivers. José's saddle wallets were replenished with bread and cheese. An Indian girl came up in time for Don ———'s pretty little wife to purchase part of a lamb for us, and we marched on, feeling quite an attachment to the town, for though the climate and soil be inhospitable, the kind-hearted people are not.

Dog-killers were rushing through the streets with short clubs, and as a wounded dog came running for protection among our baggage mules, the arriero's fat wife clung to her own pet dog until the killers were out of sight. The women generally accompany the arrieros some distance on the road, carrying provisions, which are eaten and drank on the road side just before parting. Ascending a rough, rocky road, over deeply washed ravines, we gain the smooth grass capped mountains. Between peaks of perpendicular strata, flocks of llama are pasturing. Yonder is a lake of clear snow-water, and there stands five beautiful vicuña, looking intently at us. What pretty animals, and how wild they look. They come here to pasture with their kinsfolk,

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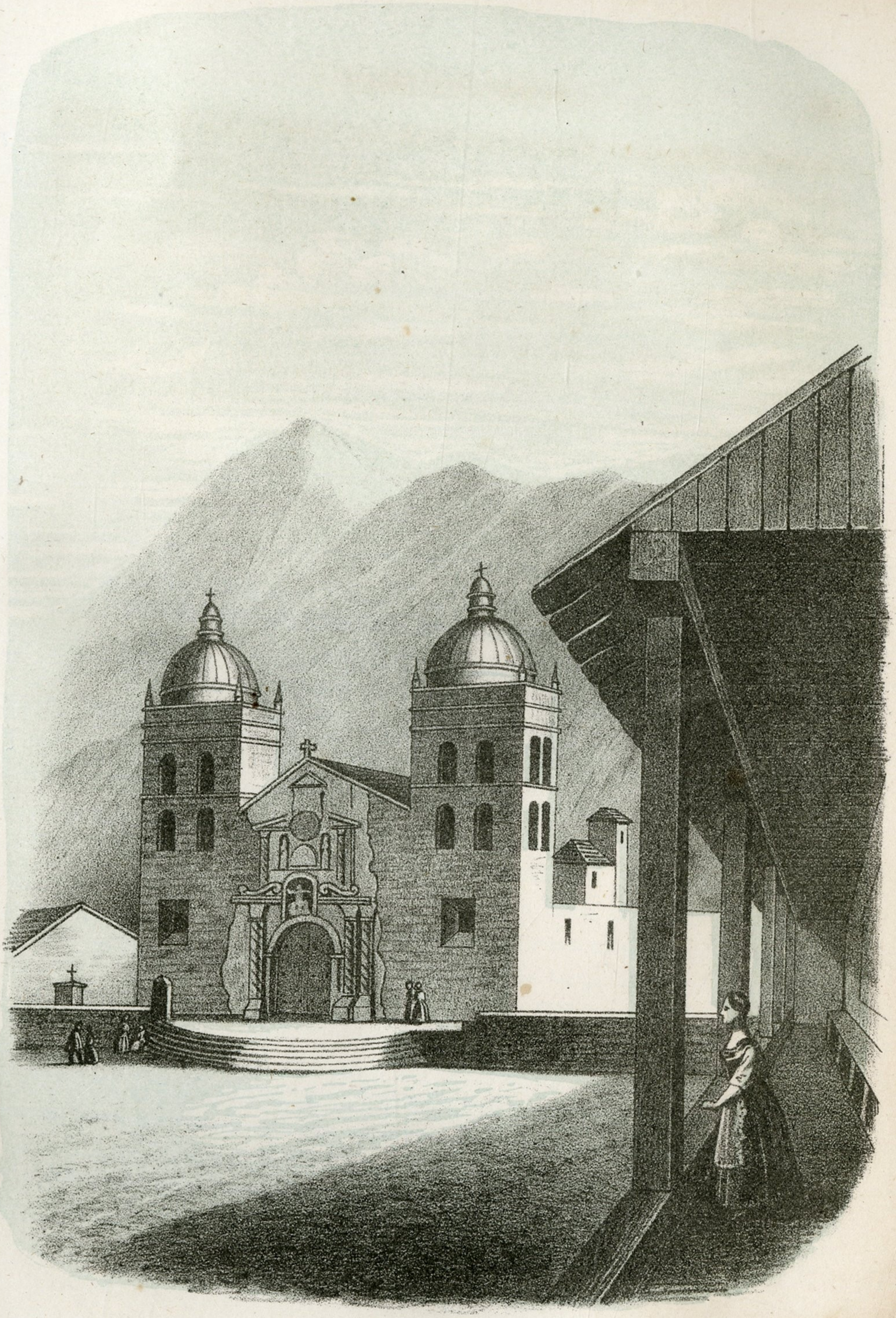

By Lieut! L. Gibbon U.S.N.

Lith: of P.L.Duval & Co. Philad.ª

MATRIZ DE SAN ANTONIO HUANCAVELICA. Peru.

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the llamas. "Richards ride round the mountain; José go with the baggage steadily along the road, while I take up this ravine, and try a shot." We all start. The male gives a whistle, which sounds among the hills like the cry of a wild turkey; the four females are off. He stands still; as I near him, he calls louder, and long before I get within ball range, he is away over the mountain brow. The sailor-boy Richards will never give up the chase; he has run his mule out of breath, and now he takes after them on foot.

The vicuña is smaller and a much more neatly-formed animal than the llama, with a coat of fine curly wool; its color resembles that of the smaller deer. In the distribution of animals, as well as I can judge, the vicuña naturally seeks an atmosphere just below the llama. It is very swift and difficult to capture. The Indians take them by driving them into pens. Now and then a young one may be found tamed, and kept as a pet among the children; they are never used as beasts of burden. Fine cloths and valuable hats are manufactured from the vicuña. A skin sells in the market for fifty cents, and the meat is better than that of the llama, though José expresses rather a disgust at the idea of eating llama meat.

Our course is to the eastward. The snow-capped mountains are in sight to the west. Temperature of a spring 48°; air, 44°. Lightning flashes all around us; as the wind whirls from northeast to southwest, rain and snow-flakes become hail, half the size of peas. Thunder roars and echoes through the mountains; the mules hang their heads, and travel slowly; the thinly-clad aboriginal walks shivering as he drives the train ahead; the dark, cumulus cloud seems to wrap itself around us.

The first house we met was Molina post; the men passed the night with their mules in a storm, which beat against our tent all night. The postman, a Spanish Creole, invited us into his house; I saw his wife, two children, one Indian servant, and five dogs, seated around a fire made of dung, over which the woman was cooking mutton. Their bed was of barley straw, and a miserable old donkey was peeping in the door at it; so I had the tent pitched. At 7 in the morning the thermometer was 37° Fahr. This is a barren country, and seems to be inhabited by the wilder animals. We chased a fox among the rocks, and shot two *viscachas*, which resemble the rabbit in size, color, and head, but the feet and tail are like those of the opossum. The people are very fond of them. The arriero smiled when he saw his supper. Richards cut one of them open to bottle its young, but we had misjudged its appearance. An Indian boy said if the mules ate any of the hair of this animal it would cause instant death. We had no extra mules to

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prove the assertion. The fur is very fine and valuable; they are running in and out of holes in the ground or the clefts of rocks, to nibble the mountain grass. The mountains are more rolling, and covered with a thick coat of pasture; flocks of sheep speckle the mountains—black and white—cleanly washed by the rains. They seek the atmosphere next below the vicuña, while the good-natured shepherdess follows with a womanly regard for the wishes of those she loves.

Another storm is coming; we hurry on, and arrive at the next post in the small Indian town of Pancara. The postman told José that the Alcalde had come to pay us a visit. A respectable old Indian, with a silver-headed cane, who could not speak Spanish, appeared, so José was my interpreter in Quichua. "How many people live in this town, Señor Alcalde?" *Alcalde*, (eating parched corn from his waistcoat pocket,) "Don't know." "Have you plenty to live upon in this part of the country?" *Alcalde*, (with the most laughably contented air,) "Roast corn and few potatoes. The people are going away; will soon be left by myself." *Alcalde*—"Going to Cuzco?" *José*—"Yes; and as we have a long travel, we have to feed our mules well. Will you order us barley?" *Alcalde*—"I will go now and fetch it."

The town is falling to decay; many houses deserted, and their roofs have tumbled in. Climate cold and unpleasant. Except our kind friend, the Alcalde, the people look wretched.

The vegetable productions of this department are few, and can only be raised in the deep valleys, where the dense atmosphere interrupts the parching rays of the sun, and they are protected from the cold mountain blasts of the night. No department in Peru is more broken and barren than this, with a greater variety of climate. In our sight are peaks of eternal snow, which run up to sharp points of pure white, standing in rows; the humble Indian, cultivating his patch of green lucerne in the valley, far below.

The animals are mostly those native to the country, and few of them tame. The horse, ass, and horned cattle, are much smaller than those on the coast, and are little used. Birds are very few, and seldom found domesticated; even the common poultry find the climate uncongenial.

Fishes are rare and small; only taken, I believe, in the Juaja river. Of minerals and metals already known, there are silver, quicksilver, copper, lead, iron, stone coal, and lime.

The silver mines of Castro-Virreyna have been worked for many years. They are situated south of the town of Huancavelica, in the Cordillera range. They count thirty mines, of which, at the present day, but seven are worked. Stone coal is found near by sufficiently good for

engine purposes. One steam-engine made a voyage round Cape Horn, and arrived safely at these mines, where it is said to be doing a good business. In all cases, the *pieces* must not exceed one hundred and fifty pounds weight, or they come to a stand-still at the landing on the coast. Two pieces are balanced on the back of a mule, which carries the heavy loads, never exceeding three hundred pounds. This is the only way a steam-engine can possibly travel through the department of Huancavelica. The unoccupied mines are said to contain water, and air so offensive, that it is dangerous for the workmen to enter them.

This department has a population, by the government estimate, of 76,111 people. Two of the aboriginal race to one Creole will not be far from the average proportion. As the old Alcalde honestly confesses, he don't know how many people live in his small town, it will be understood how difficult it is to get anything like a correct list. The people are scattered over a great space of country. We travel a day over the wild heights without meeting with a man, or find a valley too thickly peopled for the productions raised therein.

The department is divided into four provinces, each governed by a sub-prefect. These are again divided into districts, under governors, all of whom are responsible to the prefect at the capital—Huancavelica—who is allowed a secretary, three assistants, and a porter. The civil list amounts annually to six thousand four hundred and ninety-five dollars. The prefect is appointed by the government at Lima, and holds his office during the pleasure of the President of the republic. The sub-prefects and governors are also appointed by the supreme government, though generally through the recommendation of the prefect of the department.

Early in the morning we left Pancara; our good old friend, the Alcalde, still eating roasted maize, while he cheerfully expressed a desire to see us when we returned again. The Indians show great surprise when they are told that we will not return *that way*, and seem to be buried in deep thought, as though it troubled them to make out the white man's motions.

Near this small town the road leads through a number of standing rocks, which have been washed by the rains into sugar-loaf forms; and so uniform are they, that it seemed like passing through tents in an encampment. The rock is a soft sandstone, which wears away very fast at the sides, and not on the top, where seems to be the end of the grain. Their heights are from 12 to 18 feet, and so well shaped, that one might be erroneously led to believe they were the work of a pyramidal-

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minded race of men; but, upon closer examination, we found the work going on in the side of a bank, which was being regularly divided off into sugar-loaves. Had we entered this apparent encampment at midnight, I should have called out, for those rocks which stand off on the plateau a little distance look like sentry boxes around the main body of an army.

The constant wearing away of these elevated portions of the earth is beautifully demonstrated here, where the uplands seem to be *dissolving* and settling down towards a level—examples of the natural working of *weather* upon stones, so nearly resembling that of human hands with hammer and chisel. We found these pyramids for some distance along the road. Some of them were inhabited by families of Indians, large square holes or rooms being cut in the north side. Some rooms required steps to ascend; others were even with the ground. I found the family at home in one of them. Near the doorway was a horse-trough cut in the stone, and above it a place like the handle of a pot, where the end of the halter was tied. Cooking utensils, dogs, and children were seen in the lower story, while the Indian woman was spinning wool in the upper, or bed-room. A few regularly-built stone houses near by are not so interesting.

On this part of our journey, Indian girls, with *chicha* and *chupe* for sale, are seated at the tops of the steep ascents. Chicha is the favorite drink of the Indians. A party—generally old women—seat themselves around a wooden trough containing maize. Each one takes a mouthful, and mashes the grain between her teeth—if she has any—and casts it back into the trough in the most sickening manner. As the mill-stones are often pretty well worn, the operation requires time and perseverance. The mass, with water added, is then boiled in large coppers, after which it is left to ferment in huge earthen jars, when it is sold by the brewers without a license. It is an intoxicating drink, but very healthful, the Indians say. Chupe is the Peruvian national dish, and may be made of any and everything, so long as it holds its relationship to soup. It is made generally of mutton, potatoes, eggs, rice, all highly seasoned with pepper, &c.

As the weary traveller arrives almost breathless at the top of the hill, the girl tempts him. I halted by one of them, and addressed her in Spanish, but she answered in Quichua, and pointed to her chupe, which I believe she had kept warm by sitting over it during the morning. I thanked her kindly, and pushed on. Here and there an Indian hut is to be seen at a distance. In the valley to our right are flocks of sheep; and the merry laugh of the shepherdesses echoes through the mountains.

Two girls walking after their flocks, have their arms around each other's necks, joking and laughing as they leave home for a day among the hills. The sheep have just been let out of their pen, and run, one before the other, nipping the frost-tipped pasture. The dogs follow sulkily, with heads and tails hanging, as though they would rather stay at home if there was any company.

Here, as we rise to the top of a mountain, we behold all around one broken mass, ridge beyond ridge, as far as the eye can reach, like waves of the tempest-tossed ocean. Our mules are harassed, and the chronometer positively refuses to go any further. As we descend the Indians are harvesting barley. Horned cattle seem to fancy the atmospheric pressure just below the sheep.

The arrieros keep the higher road which brings us to the left of a valley. From the ridge we see the small town of Acobamba, and a turn in the Juaja river, dashing over its rocky bed, as the wild duck flies quickly against the current. The country has a fresher appearance. In the ravines, clusters of green bushes and flowers bloom; 5 p. m., air, 43°; wet bulb, 39°, at Parcas post.

I succeeded in securing a duck supper from a small lake, with a thick growth of rushes in the centre. The common mallard duck, and a black species, are found with red and green bills, and red legs. When these take fright, they hide themselves in the rushes and seldom fly. There are a number of beds of lakes which are filled in the rainy season; at present they are dry; on this route it is usual for travellers to carry bottles of water with them. A man in poncho and mountain travelling dress rode up behind us, with an Indian girl seated behind his saddle. He refreshed us with the compliments of the morning in *plain English*. He came out of the valley from Acobamba, though born in New Haven, Connecticut. His spirited horse was fretting itself over the rugged road. This man was proprietor of a circus company; had been many years in South America, and as we slowly wound our way up the mountain, told us his past history; what he had seen, and how often he thought of returning to New England. "But nobody knows me now. Years ago I heard of the changes there, and don't believe I should know my native place. I have adopted the manners and customs of these people, and if I should return to the United States again, I fear my earnings would not be sufficient. I have worked in this country for years, and am worth nothing at last." His stories of travels were interesting. He had encountered travellers of all nations, and amused me with the way in which some of them worked their way through the rough country, among the people of Mexico and South America. Speaking of the mountain roads between

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Popoyan and Bogota, in New Granada, over which travellers are borne in light bamboo chairs upon the backs of Indians, I discovered that he had encountered two of my own near relations on that route, nearly twenty years before.

He had sent a branch of his circus to Cerro de Pasco, and ordered the horses, on a raft at Huallaga river, to descend that stream, and the main trunk of the Amazon, to Pará. He had navigated the Mississippi in a canoe, and assured me at first he would try to sell his horses and go with me down the Purus. Every now and then his English ran off into Spanish. Then he would beg my pardon for not speaking his mother tongue as well as when a boy.

The Indians of the surrounding country were gathered at Marcas post, to celebrate the saint's day of San Jago, an old church in the valley. The obliging master of the post had just returned from church, a little intoxicated, like most other folks about him. The Indians were dressed in queer costumes, marching in procession, with drums and fifes, through crowds of women; some wore cows-horns and black masks, others cocked hats and gold laced coats; while the women were dressed in all colors. Young Creoles dashed about on horse-back; girls were singing and hanging most affectionately on the shoulders of their lovers. The whole crowd was *high* on a chicha diet. The morning had been spent in prayers, after which a grand procession, headed by the priest. We came in at the evening ceremony. The scenery was as beautiful as strange; the church below us, and the people lining the road from it to the post house, while drums mingled with the shouts and singing of the women. Down the sides of the mountain, Sage's circus company slowly advance. A queer-looking Mexican is the clown. A little dark complexioned Guayaquil girl, a neat rider, accompanies a fine looking Peruvian, whose fat wife, with sun-burnt face, follows. Then a pony and his playmate, the dog, with a beautiful Peruvian girl, servants, and a long train of baggage mules, all mixed in with the congregation. As the sun sets over the western mountains, a storm rises in the southwest, with thunder and lightning.

A long steep descent brought us into the valley of Huanta, where we entered the department of Ayacucho. The horse stands at ease; the swine repose coolly under the shade of a fig-tree; humming birds buzz among the flowers, and the fresh-water streams ripple through the highly cultivated lucerne fields. The gay, laughing faces of the people speak for the happiness of the valley, as do the beautiful flowers for its richness. Potatoes, beans, apples, chirimoyas, and granadillas are for sale by the road-side. Indian girls often invite us to take chicha. The

climate is pleasant. At 9 a. m., thermometer 60°. The fig-tree is very large, and bending with fruit, while peach blossoms overhang the road; large clusters of green cactus shade the quiet little ring-dove; the partridge calls from beneath the barley beards; the people are seated by the shady brook in midsummer costume. Yesterday we were shivering under a midwinter snow-storm, high up on the mountains.

At the town of Huanta, my letters were handed to the governor, who kindly gave me possession of the house of the sub-prefect, who had gone, with his family, visiting about the country. Huanta has a population of two thousand people. From the balcony we have a full view of the plaza and the market people, with the hills in the back ground, among which there are some rich silver mines. Many have been abandoned on account of water. People are anxious to receive silver bars, but not over anxious about paying the necessary expenses for getting them. The Indian finds great hardship and little profit, while he goes with hammer and chisel mining out the rich metal. The creole seats himself at the mouth of the mine, wrapped in his broadcloth cloak, and receives the treasure. The poor Indian prefers cultivating the soil, from which it is difficult to persuade him; force, at times, is *indirectly* applied through the influence and power of the authorities. The more intelligent race take advantage of his ignorance. Some, who are very intemperate, of course are generally very poor; such are enticed to the mines by a regular supply of chicha; others, again, are taught to believe that to labor in this world for the benefit of others is to lay up treasures for them in a better place; they have a dreadful fear of temporal powers, and dare not disobey. There are different sorts of slavery existing among different kinds of free people. If obliged to choose, many would rather be negro slaves in North America, than free Indians in the South.

The governor had our mules cared for, and invited me to his table under the shade of the eastern balcony. He was a cheerful, agreeable man; if he knew how, no doubt would better the condition of those around him. His fine, healthy boys are growing up in idleness, and a pretty little daughter stands most of the day in the balcony watching the Indians in the plaza, under their umbrella shades, selling fruit. She pointed out an old Spanish creole, said to be one hundred and five years old.

There are beggars and marks of the smallpox. In the ravines, along the sides of the valley, ague and fever sometimes prevail, but, generally, the valley is very healthy. The nights are cold and days warm. During our few days' stay here, the twilight was followed by flashes of

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lightning, which lit up the whole valley. The nights are cloudy, which baffles our watch for the stars. The day's travel before our arrival here was harassing.

The roof of the government house in Huanta is well tiled, and the walls well plastered, with paintings of full figures of saints, fairly executed, on them; the rooms are large, furnished, and carpeted. This is the exception to the rule.

The Huancavelica mules and arrieros returned, and we engaged others. The postman examined the baggage; pairs off the loads; and receives *half* the passage-money in advance the day before starting. He inquires, with an enterprising air, what time we would like to leave in the morning? I have found it best to tell them to come before the time appointed. The frequent excuses are various—a mule will be missing, or, the arriero may want a wife—he is never at a loss for a reason to keep you waiting until *he* is ready. The best way, after fretting a little at first, is to take things a little *easier* than they do. It is amusing to see how they dislike to be outdone, and hurry to break down opposition. Whenever these people meet with difficulties, the rule is to take a seat, and from the pocket take a small piece of paper or corn husk; a tin box supplies tobacco, to be rolled up in the shape of a cigar, and placed behind the ear; a match box and strike-a-light are produced, and the difficulty is considered in so cool a manner, while the smoke curls upwards, that unless you saw a mule, baggage and all, had broken through a miserable bridge, or fallen down a precipice, you would not believe anything had happened. The tobacco imported from Havana into Peru is highly prized, and a quantity consumed. Massachusetts cotton goods are sold by the Indians, in the plazas of these inland towns, at three times their value in the United States.

Passing through the small town of Macachara, I made José ask an Indian woman, seated on the side of the street, how old she was? She answered, one hundred years, God bless you, and "*very poor.*" At a well built stone bridge, dated 1770, a flock of parrots flew by. Our course is south, over a rocky, dusty road; the day clear and calm. At noon, thermometer, 71°, with snow-capped mountains to the northeast. There is very little growth on the mountains—here and there some cactus. We arrived at the side of a stream through which a number of women were wading. No wonder they carry such loads on their backs, they are so stout built. An old woman, with four handsome daughters, kept her dress much dryer than any of the girls, though they were more careful after they found how deep it was. They are not nervous, and don't mind men much. A plateau is cultivated with

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By Lieut L. Gibbon U.S.N.

VIEW TO THE SOUTH FROM HUANTA

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barley, and we felt somewhat interested in the ground over which we travel. It is the battle-field of Ayacucho, where the royalists of Spain, under command of Viceroy Laserna, met the independent South Americans, under the brave Venezuelan Sucre. This battle took place on the 9th day of December, 1824, when the whole of the Peruvian territory was surrendered, with the exception of Callao.

The country around is wild and deeply washed with gullies and ravines in the wet season. The Spaniards flocked to this country for silver and gold; they built a large city, and called it Huamanga; the republicans changed its name to Ayacucho, in honor of the victory. It is the capital of the department, which is divided into five provinces, and contains a population of 129,921.

The complexion of the people becomes lighter as we get south, and fewer Indians speak Spanish. They all say "buenos tardes" (good evening) when we meet them, even if it be at sunrise. Many of their expressions in Quichua sound like the language of the natives of the South Pacific islands, as I recollect it ten years ago, while cruising as a midshipman in the ship-of-war St. Louis.

The city of Ayacucho has a population of ten thousand people; the houses have two stories, with large rooms and court-yards; the streets run at right angles, and are paved. On the grand plaza stands an immense cathedral, of stone, with heavy bells and iron-fastened doors. There are twenty-two other churches. The whole city was built on a grand and expensive scale. The present population indicate a falling off in numbers and wealth. The streets are strewed with ragged children and beggar men. Under large corridors are seen lounging sleepy old soldiers, with muskets and fixed bayonets; officers parade the streets, buttoned up to the throat, with dangling swords, and some of the most unclean looking priests we have ever beheld.

In the two schools there are only thirty pupils. A professor of belles lettres and *poetry*, informed me that geography was only provided for in the college of Lima; and a teacher of *latin grammar* said the reason they had so few scholars was, the parents were too poor to pay for schooling. Among the aboriginals it is very unusual to find one who can write his name, and not unusual to find creoles who cannot write. As to reading, I have never seen a person in the country so occupied, and have not seen a public journal.

In the plaza the Indians sell barley, wheat, maize, potatoes, onions, lucerne, and fruits, brought from the other side of the eastern ridge. In a blacksmith's shop I found the mestizos burning charcoal, and upon asking whether they used stone coal, they all stopped work, and,

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with an air of astonishment, said they had never seen coal dug out of the ground, nor iron neither. One of them showed me a piece of charcoal, and inquired whether I had seen any before! As they were about shoeing a mule, I remained. The smith came into the street with a short-handled whip, long lash, and box of tools, accompanied by four workmen. One of them doubled a hair rope and slung the mule's hind foot to its tail; in doing so there was some kicking. The tools were at once set aside, and the sprightly mule most cruelly whipped; after which the shoe was nailed on and the hoof cut to fit it. The horse-shoes are imported.

CHAPTER II.

Gold and silver ornaments—Bridal trip on the Andes—Manufacturers of bark rope—Cotton trees—Winds and currents of the mountains—Population—Cultivation—Flocks of sheep—Frosty nights—Reports of robbers—Shoemaker—Ancient fortification—Indians travelling—Condor's wings—A padre on the road—Sugar-cane patches—Spanish Creoles—An African slave—Apurimac bridge—Cabbage patch—Peruvian widow—Bull fight—Fish and horned cattle—Cuzco—Market place—Steamboat navigation—Eastern side of the Andes—Coca plantation—Head of Madre de Dios—Rivers Cosnipata, Tono, and Piñipiñi—Forests—Tigers—Monkeys—Chuncho savages—View of the low lands from a peak of the Andes—Cinchona bark gatherers.

This town was formerly celebrated for manufacturers of beautiful gold and silver ornaments. Exported to Spain they were highly prized. Old ornaments are still for sale, which are of virgin metal, some of them curious imitations of birds and animals. In the small shops around the plaza, cotton goods are sold, but there is little activity in anything. The picture of decay is distressing; blind people walk arm in arm with cripples; no sound of busy wheels or of business is heard; a death-like silence prevails, both day and night, only broken by the chime of enormous steeple bells, where the ragged population kneel before an altar groaning with the precious metals. The priests, with few exceptions, are the only fat looking people in this part of the country, others being taxed for the support of the government and the church.

There are many pleasant families here; the gentlemen frank and agreeable. Several of them came to see me, and expressed great pleasure at the idea of advancing their country by steam navigation. One gray-headed gentleman told me *he* probably would not live to see the result of the expedition, but he believed his sons would, and daughters too. He gave me his blessing, which was quite sincere. The prefect was also interested in the enterprize, and showed it by presenting maps, and furnishing everything necsssary for an easy passage through a rough country. We were comfortably quartered, and kindly treated by all. The ladies of Ayacucho are handsome, ride well on horseback, are extremely agreeable in conversation, and naturally talented. One who can boast of having been in Lima, is never a "wall flower" among them. With a modest bearing, they speak out, and to the point.

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Some answer *serious* questions affirmatively at the age of twelve years. One of the first they ask is, "are you married?"

Sugar and vanilla beans are produced on the eastern side of the mountains. Ice and rock salt are brought from the glaciers, in sight, with cream from the valley. Ice-cream is made and sold by the Indian women in the plaza. Our pistols kept bright, and burnished steel remains in the open air without rusting. Grapes are not very fine in quality. Goats seem to thrive better, and poultry again appears here. At dinner, seated by a lady, with large gold rings on each hand, and heavy gold chains around her neck, supporting a locket and gold cross, it was remarked that, those wearing expensive ornaments were supposed to be wealthy. She, evidently pleased, asked me to help her cut her chicken bones into tooth picks. Some of the dishes, cups, spoons, and forks were roughly made of solid silver, though there are thought to be few wealthy people in the city.

Breakfast is taken at from 10 to 11 a. m., dinner from 4 to 5 p. m. If supper is taken, it is at a very late hour; coffee is drank early in the morning, and tea in the evening. Tables only are set twice; their meats are served in different forms, highly seasoned with pepper and spices, generally accompanied with potatoes. Quinua, a native plant, considered a delicacy, is also prepared in different ways; the seeds are cooked with cheese, or boiled with milk and pimento.

On Monday, August 4, 1851, at 8 a. m., thermometer, 59°; wet bulb, 54°. Our course stretches to the eastward again, over a dry, uninteresting road, hedged in with cactus, bearing the *Tuna* fruit. The country is uncultivated, except in the valleys. Crossing a well-built stone bridge, over a stream flowing northward, we passed a grist-mill. Peach trees were in blossom, and some few flowers. After a ride over these barren heights, the sight of a fresh rapid brook gladdens the hearts of our mules.

Matara post house is near a gorge in the range of mountains trending southeast and northwest. The potatoes and barley are of good size here; on the northwest side of a hill, I cut eleven stalks of wheat, produced from *one* seed, and counted four hundred and fourteen grains from the heads of these sprouts. It is not unusual to see twenty stalks produced from one grain—eleven is about the average. These crops are only raised after a careful system of irrigation. The Indians lead the water from the heights to a great distance; this seems to be a favorite occupation with them. Wherever water can be had, there the soil yields a rich harvest; in other places, the mid-day sun kills the young stalks.

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By Lieut. L. Gibbon U.S.N.

Lith of P. S. Duval & C° Phil.

MATARA POST HOUSE.

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One of our arrieros—a Quichua Indian—has his wife; being just married, they are very fond. This appears to be her bridal trip. Mounted like a man, on a white horse, her blue dress and scarlet manto show to advantage. She wears a straw hat, with broad ribband. Her hair, after their custom, is plaited and hangs in two braids over her shoulders. The Indians all salute her as she rides by, and has something pleasant to say to both; she bows and receives it smilingly, while he looks modestly, and becomes very much engaged attending to his duties; while nearly out of sight, among the mountains, he is constantly talking by her side.

Over these rough roads the arrieros generally travel on foot. They walk for days with more ease than the mules, and quite as fast. On the plains they trot along after the baggage for hours at a time. Messages from the governors and sub-prefects are often sent to the prefect by Indians, on foot, rather than by horse or mule. The man cuts across the mountains and delivers his despatches long before they could arrive by the road. I believe the Indians prefer walking to riding. Sandals protect their feet from the rocky and gravelly road, being at the same time cool. Whatever they have to carry is fastened to the back, leaving the arms free. Sometimes they have a short cane in one hand for protection against dogs, or for support over steep, irregular paths. I have seen them crawling on all fours, up hill.

We expected an extended view over lands to the east of our range, but when we arrived at the ridge in the gorge, we saw mountains beyond mountains, snow peaks and rocky rounded tops, deep valleys and narrow ravines, all thrown about in confused shapes. After travelling for hours, we made leagues by the road; yet the distance from the Pacific to the Atlantic is short on our map.

In the small town of Ocron, the people were threshing barley and twisting bark into rope. A good-looking young man arose from the rope-making party of men and women, and offered us a glass of chicha. It seemed impolite to refuse a kind offer when the people do you a favor and wish you to consider it as such, but I cannot drink it; so declining with thanks, we pass on leaving José, who naturally leans the chicha-way. After a long descent, we encamped by a lonely house, enveloped in foliage. At 3 p. m., thermometer, 73°. We have sand flies, musquitos, bugs, bees, and humming-birds. The whole scene is changed to mid-summer; cotton grows upon small trees, so do peaches and chirimoyas.

The Peruvian mail passed by from Lima on its way to the southern

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departments. The letters are carried in two small hide boxes on the back of a fine mule, with a swallow-tailed red and white flag flying from a short pole fastened between the trunks. The conductor is well mounted and armed; wears a scarlet cloak, and rides after; while the mounted arriero trots ahead, blowing a horn. They travel at a quickened pace up hill and down. I should like to overhaul that letter-box; but remittances are often made by the mail, and a desire to look for United States letters on the road might be considered unlawful.

We crossed the Rio Pampas, flowing northwest, upon a suspension bridge made of bark rope. Eight cables are stretched across, over which small cross-pieces of light wood are fastened to form a floor; two large cables above the sides bear part of the weight, by small ropes laced from the floor over them. Great care had to be taken by leading the mules one by one. My mule, Rose, gave more trouble than any; she was very much frightened, and would not budge until another mule walked just before her, and we all urged her not to turn back. I feared she would rush through the lacing into the river, one hundred and twenty feet below. The creaking and swinging of the bridge was fearful for about forty yards. We saw fishermen in the light-green water below; on the rocks sat numbers of cormorants, ready to dive for fish. The stream is rapid and very winding, turning snake-like round the base of mountains on its way through the Apurimac, Ucayali, and Amazon, to the Atlantic. It takes its rise to the south of us, near the tops of the great Cordilleras; our road leads along its banks, ascending through stunted trees, from which sweet air plants hang in full flower. Here the vegetable productions seem to suffer in the struggle between the moisture from the river and the burning rays of the sun, which seem to obstruct and keep down the plant that shows a desire to improve.

After a long and tiresome ascent we reached Bombam post house; the postmaster offered his house, and seemed astonished that we did not seek it in preference to our tent. He sent us chicken soup and boiled corn for supper. A flock of kids came playing about our tent; their faces resemble those of monkeys. The Indians killed a large hog, and the women made blood pudding. José assured me it was good *with chicha;* he seems to fancy the custom of living among the Indians.

There is no regular wind in this region; currents of air draw in through the mountains from all directions; although the clouds far above us show wind, we are unable to tell that it comes from any particular direction, and below it is quite calm. While encamped on the high places, frequent efforts were made to distinguish the satellites of

Jupiter by the naked eye, but we are not high enough for that yet, though our sight is very good. The rivers around flow to every point of the compass, and make it difficult to decide if the waters make the winds, or the relative positions of the mountains *alone* cause these drafts. The winds are very gentle, and curl the cirrus or hairy clouds in most graceful shapes about the hoary-headed Andes in rich and delicate clusters; when the peak is concealed, all but the blue tinge below the snow, we see a natural bridal veil. An easterly wind lifts and turns them to dark, cumulus clouds, settled on the frosty crown, like an old man's winter cap; the physiognomical expression is that of anger. The change is accompanied by thunder, and seems to command all around to clothe themselves for storms. The cold rain comes down in fine drops upon us; the day grows darker, and the clouds press close upon the earth. Our oil-cloth hat-covers and India-rubber ponchos were admired at a small settlement. The children were at school under a shed, pulling their bare feet under them to keep them warm; they looked as if they wished school was out. The people are better looking as we travel south, and are more cheerful. A girl stowed José's saddle-bags with fresh bread and cheese from a door-way, and said she would rather travel than keep shop. José said his work was wet; she answered, hers was too dry. The road becomes very slippery when wet; it is best to have the mules shod for safety as for the comfort of the animal. They worry very much sliding about under heavy rain; some of the baggage mules fall upon the ground. The flat lands are thickly populated, and well cultivated. On the rolling mountains we come to grazing again; the flocks roam in the desert, where we pass the night. At supper the arriero tells José, in Quichua, this is a dangerous country; robbers live in numbers among the mountain-tops. They meet the travellers at night upon this uninhabitable part of the road, and make what terms they please. Their modes of attack differ. If they see the party in day-time, and know the number, they come boldly up and make their demands; if they are in doubt, their guide comes alone; inquires after the traveller's health; requests a light for his cigar, keeping his eyes about him. After expressing a wish to purchase, he returns to his party, with a full report of his reconnoissance. Whether they attack or not, the chances are that they will steal the mules at pasture during the night. José don't feel at ease; is anxious, after telling me the story, to know what we shall do. The plan for the night was arranged. If the *guia* comes, he was to be made fast to the baggage as soon as he lit his cigar. José was to keep hot water at the fire; one arriero to sleep with a lasso at hand, the other to watch the mules. Should any

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one approach our tent, the arriero was instructed to lasso and haul him in under José's hot water. Richards was armed with a carbine and two large ship pistols; my double-barrelled gun and five-shooter, with rifle bore, made us in all ten shots. At midnight José peeped into the tent, and after several anxious calls, said, "Sir, the guia is coming." José did not admire the general plan of action, but it was not changed. Upon close examination, we found the supposed guia to be a donkey gazing at the fire. The weapons used by the robbers is a short thick club, slung stone balls, and knives. They seldom use fire-arms, but dread them. The savage, dissipated negro, or Peruvian robber, may come up bravely with his dagger, intent to commit murder; but let him hear the click of a revolver and he vanishes; the *noise* is offensive to him. Robbers waylay travelling merchants, lonely strangers, and trains of merchandise with loads of silver. The mules are turned from the road into a wild mountain gorge, where none but robbers live, and forever lost to the owner. The Montoneros, as they are called, control the country around.

About daylight in the morning, José was heard grumbling to himself. While he was *asleep* a shepherdess's dog robbed his saddle-bags of our bread and cheese. Sketched the encampment; called it *Ladron;* and pushed on. A thick fog, and snow under foot. At 6 a. m., thermometer, 39°; wet bulb, 37°. The pasture is improved by burning down the grass at this season. While the rain storm beats from the eastward, flocks of vicuñas are grazing to the west of us. The rain turns to hail as the wind veers to northeast.

In the valley of Andahuailas, we see the wild cherry tree for the first time in South America. After sundown, the bright pink light, which often attracts attention at Lima, and sometimes alarms the natives, appears not unlike the aurora borealis, rising far above the Cordilleras in the west, while the bright moon lights our path over the Andes to the east. In Andahuailas we joined the sub-prefect and family at breakfast. Our baggage was placed in a large room, and mules in the corral. If hospitality was not quite so highly seasoned with hot pepper it would go down easier. The rough life on the mountains agrees with body and mind much better than the luxuries of the valley seem to do.

This town has a population of fifteen hundred; mostly Indians. The valley contains six thousand. There is a great deal of poverty. The cultivated portions of land seem to be over populated. Deaf and dumb lounge about. A good-looking woman, with a baby in her arms, came to my door begging for bread. Her intelligent face was sad.

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By Lieut L. Gibbon U.S.N.

Lith. of P.S. Duval & Co Phil.

CAMP LADRON, Peru.

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When I gave her money, the poor creature nearly bent on her knees before us. My gun-cover wanted repairs; and while applying to a mestizo shoemaker, with three or four apprentices, the sub-prefect joined me. I unguardedly told him what I wished, and remarked that the man had so much business he could not repair it in time, when I was astonished to hear the sub-prefect order him in a loud and passionate way to do the work. The shoemaker pointed to the large amount of work on hand, and said he could not possibly attend to it; when he was at once ordered to do what he was told by the next morning, and to bring it to the government house. The cover was repaired, and shoemaker paid. Afterwards I was more careful.

There are abandoned silver mines five leagues south, one of which has been re-opened by a North American—Charles Stone. I did not see him, but understood he hopes to work profitably.

The productions of the valley are maize, barley, wheat, lucerne, beans, potatoes, small apples and peaches, with a few chirimoyas of inferior quality. The tanas fruit is very abundant; the cactus flower beautiful. The wine drank at the sub-prefect's table was manufactured from the Yca grape. The wife of the sub-prefect was a very kind person. At breakfast and dinner hours, ten to twelve poor Indians were sometimes fed by her. She teaches her little son to treat them politely, telling him to help them to water, &c.

Entering the small town of Heronimo, we find all the inhabitants bare-headed, on their knees in the streets and doorways; church bells ringing; host on the way through the town. A padre walks, with book in hand, attended by a man with a large umbrella to keep off the sun. A number of women and men follow, uttering prayers. One of them rings a small bell. We halted under the shade of a house while the host entered the church. As the people rose, we travelled on. Six leagues brought us to Pincor post, where we enjoyed a supper of wild pigeons, six of which were killed at one shot. They are large, and very like tame pigeons. The arrieros and José cooked them on sticks before our camp fire. Here, for the first time, we saw a snake. The songs of frogs are heard among lofty mountains. At 3 p. m., thermometer, 65°; August 15th. Next morning at 6 a. m., thermometer, 38°; wet bulb, 36°; temperature of a spring, 46°.

On a narrow ridge, with deep valleys on both sides, we have a view of snow-clad mountains to the east; by the road-side an ancient fort, called by the arrieros "Quramba." The arrieros (Quichua Indians) expressed pleasure and surprise when they saw the sketch, wrapping themselves up in their ponchos, and kneeling on the ground, looking on.

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A party of Indians came silently up the ridge; on a journey they are quiet; when at home they play upon wind instruments and drums. The girls often sing, but I never heard any whistling; they are not great talkers, except when excited, and then the women's tongues are remarkably fast. Nor do I believe they are active thinkers. Their eyes are constantly moving, for they are sharp-sighted, and notice every thing near them by a quick, sly glance. Their hearing is very good; so is their knowledge of the manners, habits, and peculiarities of animals, being constantly on the watch for game, which they trap, as they are not practised in the use of fire-arms; nor do these Indians use the bow and arrow. A boy in the party had a pair of condor's wings; one of them four feet five inches from the body joint to the tip end. The bone and joints remind one of heavy iron door hinges. The boy had caught the condor in a trap, and the bird being too much for a load, he cut off the wings and seemed to be troubled with the weight of them on his back. The condor is often seen along the sea-shore, feeding upon cast-up dead fish; but it is among the lofty peaks of the mountain this wild bird builds its nest. The most daring and experienced climbers among the boys are unable to reach their young, or rob their eggs. We looked for the nest and longed to see the extraordinary bird rise from the valley, bearing in beak and claws a young lamb to its little ones; or flying from one mountain to another with a young vicuña. The Indians are fond of baiting condors; they sometimes hide close enough to the bait to lasso them, and have been known to conceal themselves under the bait and catch them by the legs.

Huancarama, a small Indian town situated in a valley, with a little old church, and Indian population. We met the priest on the road returning to town; he was followed by a number of persons, to whom he read aloud as he rode along up hill. Our baggage mules met him in a very narrow pass; all came to a stand-still, and the not over-cleanly padre was addressing the arriero in a loud and excited voice. José assured him it was up-hill work for his party to back out; if he would be kind enough to stand on one side, we would pass on, which was done. As we cleared each other, after some chafing of baggage, the extreme politeness of the padre was more becoming. Sometimes arrieros engage in dreadful fights with stones, followed up with knives; on such occasions the weaker party are forced to give way to the strong. It is generally considered proper for those coming up, to halt on one side to give their mules a rest. Those standing with heavy loads, head down hill, suffer, and are anxious to push on. Noises made in the valley resound through the mountains; an uproar on the summit causes little

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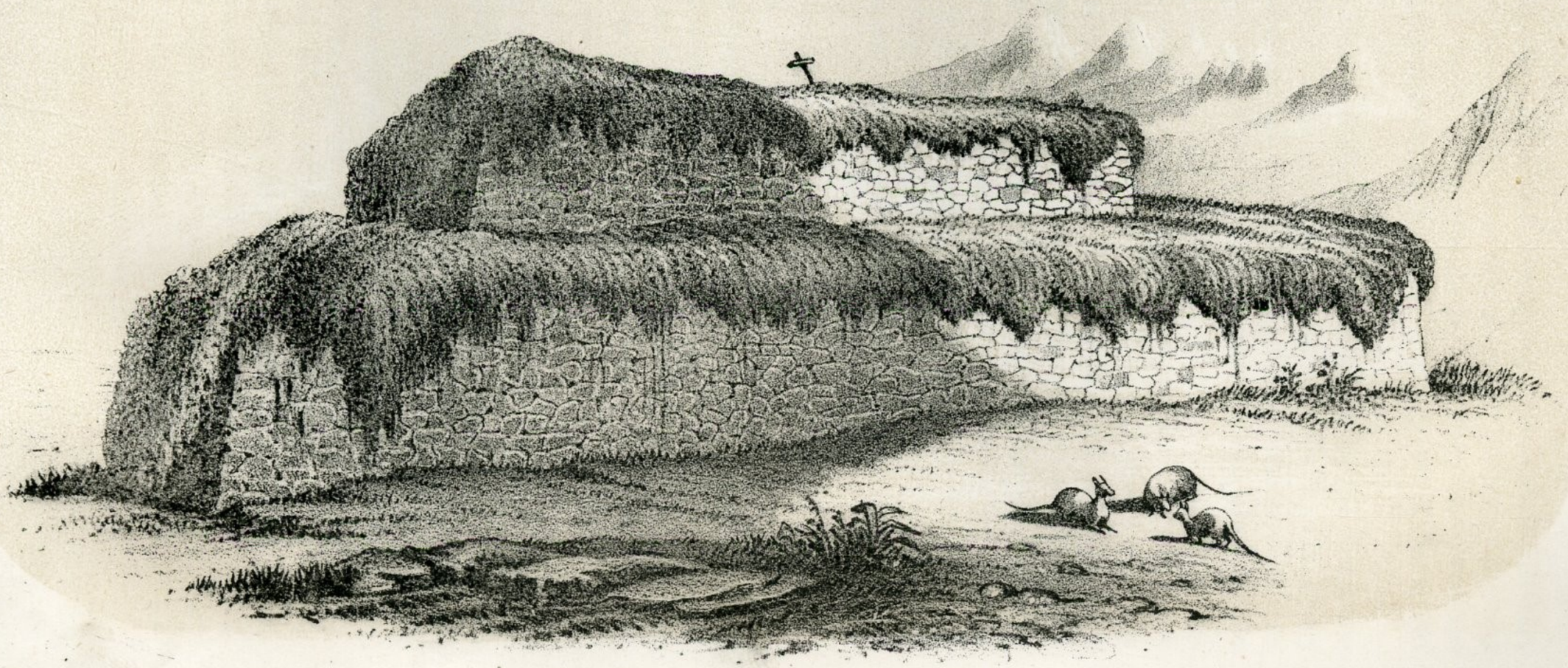

By Lieut L. Gibbon. U.S.N.

RUIN OF THE INCA'S FORT, QURAMBA. Peru.

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noise; the echo among these hills is very great. These people are very careful to unsaddle animals only *after* they are cool; otherwise, they say bumps rise on the back, which become sore. They even leave the bridle a while for fear that taking it off suddenly will give the mule cold in the head.

We see at the bottom of the valley of Carquacahua the first sugar plantation. An old Indian, with hoe in hand, is leading the snowy waters of the Andes between rows of sugar plants, which are now two feet high, with rich, yellow leaves. Man seems to suffer like the plant from the heat of the sun; both would perish under it in this valley, without sufficient water for irrigating the soil; with it, he plants and produces a crop every year. A little above his head, on the mountain side, there appears another climate, with stunted clusters of cactus, small dry bunches of grass, rocks, and dusty soil, deserted by animal life, except a green lizard basking in the parching rays of the sun. A little higher the surface is covered with a lead-colored coat of grass, turning a little greenish as the eye ascends; when suddenly a streak of dark earth is capped by the pure white snow, and as you look up it seems to get deeper and deeper, until the soil is completely enclosed in a pyramid of eternal snow.

The old Indian exchanges his sugar crop in the plaza for Massachusetts cotton goods.

Crossing a stone bridge, dated 1564, over a stream of water flowing northwest, we met a party—ladies and gentlemen—travelling on horseback. The gentlemen wear green goggles, and the ladies green veils, to protect the eyes from the glare of the sun, as the reflection of his rays on the snow often causes inflammation of the eyes, said to be very painful in the rainy season, when the snow-line reaches below the road. Though we experienced no inconvenience from the *surumpe*, as this affection is called, the creole portion of the population seem to be much afraid of it, particularly the gentlemen. When a middy, on a visit to Lima, eleven years ago, I formed a high opinion of the Peruvian horseman as he pranced through the alameda in the evening, on a well trained animal. The Peruvians, anxious to make a show before strangers, put spurs to their spirited horses, ride at full speed, halt suddenly, and worry the animal by turning short round and jumping him. A man rode by me at full speed, and drew up just before my mule; in doing so he pulled rather hard on the Spanish bit, and the horse throwing up his head, struck the rider in the mouth, cutting his lips and displacing six of his teeth, which saved him from pitching over the horse's head.

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The ladies and their maids are fresh-looking, and manage their horses with ease. A negress rode a man's saddle, and wore a flat straw-hat, trimmed with fancy colored ribband. The riding skirt is dispensed with under the bloomer style; she wore very long orange-colored *silk* stockings, and on the heel of a small and neat black shoe were buckled her woman's spurs. Her horse had a rocking pace, her hat gracefully placed on one side of her plaited wool, with a large cigar between white teeth; she smoked her way through the mountains, carefully guarding her smiles, only condescending to deal them out to her mistress's most deserving friends. African slavery exists in Peru.

On arriving at the town of Abancay, the sub-prefect was in the country. The governor kindly offered me a house, but as I wished to make some observations upon the stars during the night, we passed on, and encamped in the neighborhood. At 2 p. m., thermometer, 77°. The mules were well fed with lucerne. They suffer and begin to show effects of the travel. The parrots are talking in the bushes near our tent, and a cricket lives with us.

The climate is delightful in this sugar valley. Near town is the ruin of another fort. Flowers, vines, and bushes cover it so thickly that the traveller would not suspect he was passing a masked fortification. The road from it leads over the mountains to the northeast. At 11 a. m., temperature of a spring, 54°; air, 55°; sun, 60°; cumulus clouds and northerly wind. The road seems to be getting worse, and the overhanging rocks are so low, we occasionally bump our heads. By way of resting our animals, we march on foot. A few hours travel, over a wild country, brings us into another valley, where the cattle are larger than any we have yet seen. Passing an idle great mill, on a stream flowing east, we came to the hacienda Lucmoj, a grove of willow trees shaded the avenue; the house was of two stories, large and neatly white-washed, the garden richly supplied with fruits and flowers; the peach tree in full blossom. The out-buildings for the Indian servants were in good order; the shelter for sheep, horned cattle, horses, mules, jackasses, and numbers of goats, showed unusual kind treatment. The owner of this valuable estate was a young bachelor, of intelligence and hospitality. The death of his father gave him possession of the property. He talked with me about his country, and remarked that "the *government* did nothing for the people." Upon being asked, why the people depended upon the government, he looked surprised, and wanted to know whether all the improvements in North America were not made by the government? The few silver mines in the neighborhood have been abandoned.

After declining a polite invitation to remain some days, we took a short cut across the corn-field to the town of Curahuasi, a miserable little Indian place. The water from the mountains passes down the ravine to small patches of sugar-cane. The mountains are wild; winding around one of them, we suddenly came in sight of the long-looked for river Apurimac. Its waters foam as they dash over its rocky bed. Our view was cut off by another turn, and leaving the surface of the earth, we enter a tunnel, cut into the mountain, which stands like its strata, perpendicular, by the side of the river. Sky-light holes are cut through the rock, and as we travel along, in alternate light and darkness, the arrieros shout at the top of their voices at the train. The mules are fearful of proceeding. Coming to a house, which was open on both sides, we looked over the Apurimac bridge, and then down into the river, a fearful distance below. The toll-house is inhabited by two women, a man, a child, a dog, and two jugs of chicha. The ropes of this suspension bridge—of bark, about the size of a sloop-of-war's hemp cable—are made fast to the posts which support the roof of the house. It is best for travellers not to be too particular in their examinations, how these ropes are fastened. A windlass in the middle of the house kept the ropes hauled up when they slack off. One woman, a good-looking black, was seated by a large jar of chicha, which she sold to travellers, with her child on the other side; she spun cotton, with a smoking fire close by to keep off the sand flies. These little insects are here in swarms. A white woman was seated by the windlass, holding her head in her hands. I thought she had the small-pox, but the red bumps on her face were caused by these annoying flies. The baggage was taken off the mules as they were brought through the house, and one by one taken across the river, when the arrieros carried over the baggage on their own backs. When Rose, a most sensible animal, saw the bridge, she held down her head, laid her ears back, switched her tail, and plainly *kicked* out the words, "I won't go over." She is generally indulged and coaxed; an old mule was put forward, and she behind to follow him. As the arriero walked on with the bridle, the toll man pursued the old mule with a rope's-end, when it backed, kicked with both heels, pulling the arriero along. We took shelter behind the windlass, with a barometer, the woman screamed, picked up the child with one hand by the neck, and the chicha jug by the same extremity, and beat a retreat. She mounted the windlass, and, in a towering passion, commanded with her tongue, telling the men to secure the animal at once. José stood out of the way with Rose, for the old mule had charge of the house, and was getting warm; he succeeded in putting his hind-legs in the fire,

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when the chunks flew in all directions; the mule became angry, as if it had been abused here before. As soon as he cooled down a little, the bridle was taken off; a hide rope put over his head and hitched round his nose; each fore-leg was also fastened by the end of a rope, and three men held the three ropes. The nose-rope was fast pulled until the mule's neck was stretched out; one foot-rope advanced one leg; the other foot-rope being then pulled, brought the first foot down, getting one pace ahead; so they gradually walked him over. Rose had been looking on at the effects of his obstinacy, and gently followed. Two dollars were paid for our two mules and the baggage; the arriero paid six and a quarter cents apiece for his mules; this is the *custom* of the country. The bridge is eighty yards long and six feet wide, distant one hundred and fifty feet above the dark green waters. There are six floor-ropes, crossed by small sticks, lashed with strips of hide to the cables. This platform is hung to two side-cables by small bark ropes. The river flows northwest, with a width of twenty yards.

The Apurimac empties into the river Santa Ana, and is an important tributary to the Ucayali, after it receives the waters of the Juaja. We are told the Apurimac was the western boundary of the Inca territory during the reign of the first Inca—Manco Capac. The road from this bridge to Banca post-house winds up the mountain. In some places the rock has been cut like stairs. The arrieros help up the mules by pushing against the lower part of the baggage; we were continually stopping to have the loads fastened on. There are few houses near the post—uninviting in appearance—the people being mostly mestizos. A party of women and men, all intoxicated, seated by the road-side drinking chicha, politely invited us to join them; some looked very thin and sickly; an old woman was groaning on her bed at the door; a boy close by her had some horrible disease breaking out on his face; he was deformed and looked like a person on the edge of the grave, but amused himself by playing in the dust; his ghastly stare made us fear he had some infectious disorder. On the other side was a woman shaving a boy's head—the shape of a mule's more than that of a human being. An enclosure, containing a patch of cabbages, was found near a stream of cold water, which flowed rapidly from the snow peaks in sight, through an expensive aqueduct, supported on pillars of stone, neatly white-washed, leading to a sugar plantation some distance below us, on the east side of the Apurimac. We encamped here without permission of the owner, who was absent. While our mules were feeding and we enjoying our supper, a woman came in, and in a hurried and excited tone of voice, addressed me in Quichua. Our difficulty was

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By Lieut L. Gibbon U.S.N.

Lith. of P.S. Duval & C° Phil

APURIMAC BRIDGE Peru.

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with a Peruvian widow, very good-looking, but who talked at a terrible rate. José concealed himself behind a peach-tree full of blossoms, preparing tea. She said she was poor, but had sons full grown, and that we had taken her garden fence down, and turned eight mules among her cabbages. José told her, when we arrived, tired, after a long march, she was not at home to give consent; her grounds had particularly pleased us, and we had taken the liberty to enter them for the night; in the morning the fence should be repaired to her satisfaction, and money paid for the use of her grounds; the arrieros' mules should go out, and ours be fastened and fed close to the tent, which was not among the plants, but at a proper distance on our side. She, smiling, accepted a cup of tea, and they spent the evening sociably together, in the clear moonlight, with no sand-flies, and a westerly wind.

Cabbage, salad, onions, and garlic transplanted here, do not thrive as well as on the coast, and are less cared for than the potato; except the garlic, which is a favorite with the creoles. Leguminous plants are used in the chupe when nicely made.

August 19.—At 6 30, a. m., thermometer, 53°; the widow's fence being repaired, she received pay, saying "God bless you, good-bye." As we rode off we caught José receiving an answer to his farewell smile. At 11 30, thermometer, 70°. The country has a dry, uninteresting appearance near the town of Mallepata, yet the animals and vegetables seem to be in larger proportion. Flocks of parrots and pigeons increase in numbers; the sheep appear to be smaller in size; horned cattle and horses are plenty; the mountains are lower; sugar plantings more numerous. Tall willow trees grow by the side of a stream we cross, flowing south, and another running west, with milky colored water, which the arrieros prevent their mules from drinking, saying it is not good for our use. The people we meet look like Chinese in the face, and dress like gentlemen of the olden time—short breeches, long coats, with big buttons and large pocket-flaps, in cloth of scarlet and of blue.

As we rode through the Indian town of Limatambo, our attention was drawn to a crowd of people on the plaza, which was barricaded at the corners, and seats put all around. Flags of different colors were waving in the air; drums beating to a singular noise of wind instruments. We had arrived in time to see a bull fight. The matadores were dressed like the clowns of a circus. People were busy receiving and arranging large chicha jars by the walls. All were dressed, and behaved well. The boys gathered round an enclosure with a door opening into the plaza. The girls sat up straight on their seats, and looked cheerful and pleasant. Among them all, I only observed two

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white persons, who were of Spanish descent, and neatly dressed in blue. The town was filled with people from the surrounding country. Musicians marched round the plaza in the rear of six Indian matadores, who taking their positions, a strict silence followed. A door opened, and out popped an immense *condor*, fastened by the bill with a line, and to the other end of which a large man was attached. This *surprise* brought forth shouts and laughter. The bird flapped his large wings, and ran about trying to escape. The music commenced again, and he was taken out, when, during another silent pause, in bounced a young wild bull. As the Indians shouted, he came to a stand in the centre, as though waiting to be heard. He soon began to play; shaking his head, he made a dash, and knocked a man down. The Indian lay flat upon the ground; the bull bellowed with rage, while he endeavored to get his horns under the body to toss him, throwing back dirt with his fore-foot. Not succeeding, he got down on his knees, yet the Indian was too flat for him to lift. Others came up and teased the bull away, when he charged at several, until the animal was completely exhausted. Then he made for the door, and the people so laughed at him, that he came back in a rage; but there were many on the ground, and he was bewildered, and could not make up his mind who among us all he could attack. He retired with the music; others entered, till the afternoon passed away. When we were far on our road, José said the people were merrily dancing away the night. The chicha is brought from a distance on jackasses, in large raw-hide bags, well corked; two bags are slung over the sides of the animal.

In the flat bottom near the town of Suriti, some small fish were bottled from a snow-water stream. During a heavy hail storm from the southeast, sheep flocked together in small gangs, and stood in a ring, with heads out, like a drove of partridges going to rest. The hail-stones were as large as peas. Thunder clapped about our ears. At mid-day, thermometer, 65°; two hours after, amidst the hail storm, it fell to 41°.

Ducks, geese, snipe, and a large black curlew, are found in the valley in great numbers. In the rainy season, a portion of the lands are flooded. Now the cattle have good pasture. This land shows the remains of a large lake, to judge from appearances. The annual deposits washed from the mountains decrease the depth of water at the end of each rainy season. The land gradually rises, channels are formed, and the water is drained off, which in time will leave the valley free of floods. When fish become extinct, horned cattle and the shepherd's herd occupy their places. The Indians are breaking up their barley stubble with ploughs. Population increases. The road is paved as we

rise to the top of a small gap, and pass under a large arch, which supports a well-built stone aqueduct. We halted, and gazed with delight at the ancient curiosty of the New World—the city of Cuzco, centuries ago the seat of the Incas. The view is beautiful. Close against the hills, at the west of the valley, we see the ruins of the Temple of the Sun; Catholic church steeples rise amidst smaller buildings of a large city. The floor of the valley is carpeted with green, while afar off, opposite the churches, are the white snow-capped Andes in a clear blue sky. Suddenly a heavy cloud came over the city from the south, and we arrived in the plaza under a heavy rain. Entering the government house, I found the prefect of the department of Cuzco very sick in bed with "peste," (influenza,) attended by a doctor and a priest. His aide-de-camp appeared in full uniform, and laughingly told me he was a lieutenant in the Peruvian navy, with a major's commission in the army. We arrived in time for a good dinner: soup, fish from the Apurimac, beef, poultry, potatoes, yuca, rice, and salad, with pine-apples, chirimoyas, plantains, oranges, and granadillas. The wine made in the valley is sweet and mild, superior to that of Yca; excellent coffee is grown on the eastern slope of the Andes. José hung his saddle-wallets behind the door, for fear the dogs might again eat his bread and cheese. The old man and the mules need rest. We have been forty-five days on the road from Tarma. Upon paying off the arrieros from Andahuialas, I advised them to be more particular with their money; never to spend it in chicha for themselves before they buy food for their mules, which they promised me should not occur *again*. When leaving, they wished to *kiss* my hand—a practice encouraged by the priests and authorities, but particularly offensive to the North American, especially after the poor Indian has faithfully performed his duties.

August 23, 1851.—At 8 a. m., thermometer, 57°; wet bulb, 55°. In the plaza we find, for sale, maize, barley, wheat, beans, sweet potatoes, white potatoes, chirimoyas, plantains, bananas, oranges, limes, papayas, watermelons, granadillas, and dried figs, in their season; also peaches, apples, grapes, and cherries. There is a great display of pottery, well made, and fancifully colored. White and printed cotton goods bring high prices; so do coarse woollen cloths, particularly those of blue and scarlet. The whole population require thick clothing here. The Indians consume the coarse goods, and fancy large dark bone buttons. The creoles generally wear broad-cloth. Everbody has a cloak, worn out against the door-post, or at the corners of the streets, where the wearer lounges in the sun. White sombreros or Texan hats are worn during the week, but on Sundays black beavers. Scull-caps are very

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much the fashion, made of wool and cotton, with ear-flaps, and strings to tie under the chin. The ladies, at church, wear black silk dresses, fancy silk shawls and stockings; bonnets are not *yet* worn. On Saturday, the shoemakers enter the plaza, where their wives and daughters sell the week's work. It is an amusing sight to see the inhabitants trying on shoes; gentlemen take this opportunity to compliment the ladies upon their small feet, which never offends.

The city of Cuzco has a scanty population. The department contains 346,031 souls. There are very few African slaves in the southern departments.

I found a very friendly disposition towards the expedition, with a desire to aid me. The prefect offered twenty soldiers as an escort in the low country, to the east of the Andes. A number of young men volunteered to accompany me. A meeting of the citizens was held for the purpose of forming a company to join me. At their suggestion, the President of Peru was applied to for the payment of twenty thousand dollars, appropriated by Congress, for the exploration of the Rio Madre-de-Dios, supposed to be the same with the river Purus, rising among the mountains to the eastward of Cuzco. I was very much pleased also to hear a spirited young officer had applied to command the soldiers. From investigation made, I learned that the head of the Rio Madre-de-Dios, was some distance *beyond* the line between civilization and the savages, the Chuncho Indians.

September 16.—The day for my departure had arrived, but neither volunteers nor regulars were ready. Richards was sick, and left behind with the baggage. The party was reduced to José and an Indian boy, who drove an old horse, with a box of instruments, a little camp furniture, and biscuit as his load. The mules were in good order. We mounted the hills to the left of the valley, taking the short or twelve leagues road to Porcatambo. The wind and course were easterly, with a cold rain falling in small drops; temperature of a spring, 60°; the air, 54°. A bridge over the river Urabamba is constructed of brush-wood cables. Our mules gave much trouble to get them across. José was sent some distance below to wade the mule—"Bill"—as a phthisically fat woman declared his heels were too dangerous to her charge—the bridge. The river flows north, between mountains, ranging north and south, with perpendicular strata of rock and red clay, and is a tributary of the Santa Ana. We met droves of mules, loaded with bales of the coca leaf, on their way to Cuzco. At daylight, in the morning, as we entered a deep gorge, the warm east breezes, mixed with the cold mountain air, remind me of spring time at home. A well-dressed old Indian, with scarlet vest, kindly offered us part of his breakfast; he was taking it in the doorway of his lonely little hut, among these rugged mountains. At 6 a. m., thermometer, 60°, and at 6 p. m., 66°. We crossed a well-built stone bridge over the Mapacho river, which is said to flow north into the Santa Ana, but this is doubtful. The houses of the town of Porcatambo are small, and the population seven thousand; miserable looking, excepting the Indians, who are full of health and life. Many of them have noble faces, and are willing to do anything required of them, except to enter the low country to the east. Like the creoles of the town, they have great fear of the Chuncho tribe of Indians, who are at war with the Peruvian government. The sub-prefect and his wife were very kind; twenty-five able-bodied creoles volunteered to accompany me; I accepted their services, but the next day the arriero being alarmed, deserted; the volunteers backed out to a man, when José suggested an opinion that volunteers did not act so in North America; at the same time he frankly acknowledged he was afraid of the Chunchos.

Our road lay along the river in the narrow valley, where Indians were ploughing with oxen; peach, apple, and cherry trees in blossom. The Indians build their houses partly of wood; they carve spoons, bowls, plates, and baskets, beautifully, with iron chisels. At 5 p. m., thermometer, 68°. At Totora farm, we halted for the night, and met a young Philadelphian, named Charles Leechler, engaged in collecting Peruvian bark for a number of years. At first, he spoke with difficulty in his native language, but with a true American spirit assured me I might depend upon him as a companion. He knew parts of the country I was directed to explore; his services were the more acceptable. He joined me.

Turning from the river we ascend a steep ridge of mountains—the eastern range at last. A heavy mist wafts upwards as the winds drive it against the side of the Andes, so that our view is shortened to a few hundred yards. We hope the curtain will rise that we may view the productions of the tropical valley below; but the mist thickens, and the day gets dark with heavy, heaped-up black clouds; a rain storm follows. The grasses are thrifty, and the top of the ridge covered with a thick sod. By barometer we stand eleven thousand one hundred feet above the level of the sea. I was obliged to leave my box of instruments in Porcatambo on account of bad roads, and take barley for the mules. By law, the cargo of a mule descending the eastern slope of the Andes is one hundred and fifty pounds—one-half the usual load. Wild ducks are seen feeding in the small lakes.

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September 21, 1851.—At mid-day, thermometer, 54°. Riding along the ridge to the northward, the road suddenly turned east, and immediately descending, we met with foliage, flowers, and fruit; among them a few intimates—the common blackberry and whortleberry; the fruit large, but very acid. At every step we take the growth increases in size, until, after descending the mountain-side, we are enclosed in forest trees. Our course in winding down being towards the centre of the earth the compass is of no use to us. The way is lined with the bones of mules and horses killed by falling down these precipices, which don't deserve to be called roads. Among the limbs of the trees parrots were chattering with monkeys; trains of large ants cross our path. This insect is never seen on the top of the Andes. Under a rude shed by the side of the mountain torrent, Cherimayo, we found shelter from heavy rain in large drops. Thermometer, 61° at 5 p. m. There is no pasture for our mules; they are confined to the path by the dense growth of bushes and vines, and are kept near all night by fencing the track on both sides. Upon inquiring of Leechler the number of inhabitants, he informed me a few men were gathering Peruvian bark in the woods, but it was difficult to tell where they were, as the cinchona trees are thinly scattered over the country. The bark is represented as inferior near the base of the Andes here. The best quality sells at twenty-five dollars the hundred pounds in the market of Cuzco.

The regular rainy season will soon set in, when all the *cascarilleros* (as the bark gatherers are called) carry the bark home. They enter about the commencement of the dry season, or about the middle of May; roam through the wilderness. When they meet with trees, a little house is built for protection at night, under which the bark is kept dry. The tree is felled by an axe, the bark stripped off, dried, made into small bundles, and carried on the backs of men—who are generally mestizos—to the nearest point at which a mule may be brought.

This life is one of great hardship; the workmen are often caught in the forest without a supply of provisions. In case of fever, however, they are well supplied with quinine; but many of them die. The climate is very changeable; a cold, heavy rain falls, alternating with the rays of a tropical sun. Leechler pointed out the cinchona trees; the *cascarilleros* distinguish them at a distance by their bright-colored leaves; very smooth and light green, with here and there a yellowish leaf. Standing on one side of a ravine, the men count the value of the opposite side, or they climb to the tops of the loftiest trees and survey the country around. The forest trees here are very valuable for their varieties of ornamental woods. Leechler undertook also to give me an

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By Lieut. L. Gibbon U.S.N.

Lith. of P.S. Duval & C°. Phil.

DESCENDING THE ANDES TO THE EAST OF CUZCO.

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idea of the number of beautiful and valuable tiger-skins to be found in the bushes. I had been thinking of the water-power dashing by us for a saw-mill; when, before going to sleep, he said, "Cover your head, sir, at night; for the serpents here are very large." These are productions not always enumerated in a commercial list.

At 5 30, a. m., thermometer, 49°; temperature of stream, 49°. Clear morning. The road was much obstructed by bamboo, and in a very bad condition. We have to halt and repair the road, or cut away the brush-wood; the wet branches keep us damp; now and then a mule ahead runs into a bee's nest, which sets all into activity. Our mules plunge into great mud-holes, and are fretted among the roots of the trees. At mid-day, thermometer, 74°, showing an increase of 20° since yesterday at this time. The country is rough; the hills completely enveloped in forest trees. The descent is still great. Arriving at the house of a squatter, we put up for the night. Cascarilleros bring their bark here to deposit it. The place is called Cueba. Three families live in bamboo houses; the men and women are engaged in clearing little patches of ground, where they plant sugar-cane, sweet potatoes, pumpkins, peppers, plantains, oranges, potatoes, watermelons, cotton, and yuca. Probably there may be 40 acres in all cleared. Yuca serves for bread where they have no flour; it is a species of potato like the yam of Panama. It is a root shaped like a beet, from a small tree, which grows to the height of a man, with a trunk as large as his thumb, having crow-foot-shaped leaves in a bunch at the top of the stalk. It is planted from cuttings in rows apart, that the plant may be kept free of weeds. The yuca is valuable and delicious, either boiled or roasted. The people are very fond of it, and boast about the enormous size of some of them. I never saw one more than 18 inches long, and of ten or twelve pounds weight; generally smaller; though seriously told by persons at a distance from their habitation that in the Montaña *one* is enough for a mule load. Yuca is at once liked as a vegetable by most strangers.

Clearing the land is a tiresome business; trees cut down at the end of the wet season, when they are full of sap, burn with great difficulty. The brushwood and thick undergrowth is troublesome, though the soil is very productive, after being well cleared. Our mules found a blue grass, which springs up upon exposing the soil to the sun, and keeps cattle in good order. The people are mostly Spanish creoles, and seem to lead a miserable life. Including cascarilleros, there are about twenty-five people who may be said to belong to the houses. There are no others in the neighborhood. They are glad to see travellers to hear the news, for they are shut out from the world. This place might be

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reached by a less precipitous way, crossing the ridge nearer Porcatambo, and entering the montaña further south. Such is the report of the cascarilleros, who are the best authorities with whom we are willing to consult.

At night, I was politely given the centre of the floor of one of the houses for my bed. Three men slept on one side of me, and the very pretty woman of the house on the other, with a sucking baby between us, which seemed to have a most extraordinary appetite for milk, and kept a constant snuffling and pulling like a young pup. The houses are built with bamboo, placed about four inches apart, that air may pass. After we all got to sleep, something made a noise near our heads, and in the morning tracks of a large tiger indicated his desire for a baby. The men thought he must be a monster by the foot prints; and pointed to where he had his paw through the opening, but his arm was not long enough. They are seldom so daring, and he must have been very hungry.

Gradually descending, we crossed the Tono river. Water, 63°; air, 74°, at 9 30, a. m. The hills are getting smaller; the road in some places more level, until we suddenly come to a cleared pampa, covered with a rich pasture, on which are grazing a drove of mules. Four houses are built close to one another, and near them a large patch of pine-apples. One Indian woman was at home; she was Quichua. We afterwards arrived at San Miguel farm, where a number of houses are built in a hollow square, with a little wooden church, and fine orange trees in the centre, under the shade of which I was embraced by Padre Julian Bovo de Revello, a Franciscan missionary, honorary member of the Agricultural Society in Santiago de Chili.

Monday, September 22.—At 3 30, thermometer, 81°. We are now on the eastern frontier settlement, where one hundred men are engaged cultivating the coca plant. The seed is planted in rows like maize. In two years the bush, five or six feet high, is full grown, bearing bright green leaves, two inches long, with white blossoms, and scarlet berries. The women and boys are now gathering the ripe leaves, while the men are clearing the fields of weeds. The gathering takes place three times a year, in cotton bags. The leaf is spread out in the sun on mats and dried. In wet weather they are spread under cover, and kept perfectly dry, otherwise the quality is injured, and the market price very much reduced. The bushes produce from forty to seventy years, when a new planting becomes necessary. The leaves are put up in cotton cloth bales of seventy-five pounds each, and sent to Cuzco, where it sells for fifteen dollars per bale. The Indians masticate the leaf, and sometimes

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COCA PLANTATION. Peru

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drink it as tea. There is a constant demand for it. Those who work in the mines are inveterate chewers. On long journeys, or while undergoing fatigue of any kind, it supplies the place of the tobacco leaf. It has a soothing effect. Slacked lime or ashes from certain roots are used by some of the old chewers to give it a finer flavor. The plant can only be raised in a moist climate. It is never found in the deep valleys of the Andes. It offers the most important inland trade in the department of Cuzco, and is the inducement for settlers to venture to the base of the Andes. Though the tropical productions can be raised, they are seldom cultivated to great extent. Coffee, sugar-cane, cotton, rice, chocolate, tobacco, limes, and lemons, are to be had. The padre pays attention to experimental farming and cattle raising; he has a little drove, a few cows brought from the tops of the Andes; also ducks, pigeons, and chickens, which he feeds upon corn cultivated by his own hands. His upland rice is fine, without flooding. The padre is a perfect representative of Robinson Crusoe; though he has no goats, he has four dogs. An old Santa Cruz soldier acts as his man Friday. In his little hut he has a few books and two old hats. He wears one when he works on his farm, the other an old hen lays an egg in every day. He seems to be happy, but said he wanted very much to go home to Italy, by the way of the Rio Madre-de-Dios and the Amazon, for he thought if he could find a road to the Atlantic by which his countrymen might come up, he would make a fortune.

I had arrived at the *end* of the road for mules. The only way to shorten the distance between us and the Atlantic was to dismount and cut a way through the forest on foot. The undergrowth is so thick, that it is difficult to see where the tigers and other wild animals get through.

José was left in charge of the mules. With a barometer and poncho slung to my back, revolver in belt, long knife in hand, I pushed through the woods, accompanied by the padre, Leechler, and four Indians; the padre whistled up his dogs. After a most difficult struggle, twelve hours brought us to the bank of the Cosnipata river, in the territory of the Chuncho savages. The stream is very swift, with a rocky bed, forty yards wide; the water of greenish color. This stream takes its rise to the south, in the mountains of Carabaya, where the people are washing for gold. The day's march was through a level country, with the exception of two small hills. Leechler shot two wild turkeys, and a fine fish, which helped out boiled rice and parched corn for supper. We had been very much bitten by ants and stung by bees. The right arms were tired of cutting a way with the machetes. According to our

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reckoning, we have travelled nine miles; a bush house was constructed; our beds, the bare ground; the dogs lay by us; they had ranged about in all directions during the day, and were well tired. The padre called one of them *Paititi*, after a large town of the Chunchos, in the wilderness to the northeast of us; another *Alerto*, (vigilant;) a third *Cabezon*, (big head;) and the fourth, *Valedor*, (protector.) Paititi was a middle-sized, short-tailed, chocolate-colored dog, the bravest and most active. The padre kindly presented him to me. One of the Indians was taken sick; I administered three anti-bilious pills, which cured him after a sleep. Cutting enough balsa wood early in the morning, the logs were fastened together, and the first North American-built raft launched upon this tributary of the Amazon. I embarked with Leechler and one old Indian for the opposite shore. There were falls above and below us; the current swift; we poled part of the way, but soon found the river too deep for that process. We landed on a rocky little island, after being nearly carried over the falls; Leechler lost the balsa on his return for the padre; the current was too swift for him, and he had to swim for life, while our bark was swiftly carried down stream, and wrecked against the rocks. At 1 p. m., thermometer in the sun, 100°; temperature of the river water, 70°. In the evening, Leechler had been working with the padre and the Indians, cutting more timber. He swam over, and spent the night on the island with me, in preference to sleeping in the woods; we lay down upon the rocks, under a heavy rain, with loud claps of thunder, which echoed up the Andes. At midnight, the old Indian called us from our bed of water; the river was rising; the night was dark, and rain poured down. A match was lit, when it was discovered we could not escape; we saw the rushing waters between us and the shore; a sudden rise of three feet would carry us off. Leecher assured me we could not gain the shore by swimming. The old Indian said "I was a bad man for bringing him there, when he could not swim." A mark was placed by the edge of the water, and we seated ourselves very uncomfortably to await our fate. The roaring of the waters was terrible. Leechler looking at the mark, finds our island very much reduced in size by the flood. The old Indian hears the dogs bark, and we think the Chunchos are attacking the padre on the main land; I blamed myself for bringing these people so far. Should the stream continue to rise at its present rate, we must be lost; suddenly, the old Indian looking up, turned to me with brightening eyes, pointed to the southeast, and said in Quichua, "day-break." This was great relief, particularly as I saw the Indian smile; it was expressive, natural, and knowing. As the day-light came, the storm cleared off, and we survey our prison. The

waters had turned muddy, the drift-wood came dancing by us, great logs rolled over as they floated down; the wild Toucan, with its large beak, screamed as it flew over us to its nest; the fish seemed to rejoice at the flood, jumping up in the air as though making signs for the river to rise; while the good old padre, dressed in his snuff-colored robes, motioned to us the waters were subsiding. The waves made by the rapid motion of the water in mid-channel were quite as high as our heads, and the island much reduced in size. The water runs off very soon after the storm passes away, and we gained the opposite mainland. Leechler lost a second balsa in trying to cross the stream to the island again for the Indian, and another night was spent with the party divided. Our provisions were getting short. A small bamboo balsa was now constructed, the barometer, pistols, and clothing put upon it. My provisions were left with the old Indian, and he was told to remain there until we returned. He said, "if he was left alone, the Chunchos would murder him, or the tigers would devour him at night; if we left him he would jump into the river;" but he was again directed to remain where he was while we sought help, to take care of his provisions, and he would soon be with his friends. He told Leechler he would obey, but "he must first bring over his coca," which was on the opposite side.

With Leechler on one side of the bamboo raft and I on the other, we jumped into the stream, and after hard work, swimming, we gained the padre in time to save our raft from passing over the falls. In the evening we were at San Miguel farm, after three days' hard work, and two nights without sleep. Resting ourselves we found great difficulty in getting persons to go with us after the old Indian. The padre made a spirited speech to them, which had the desired effect. In the evening we encamped at the junction of the *Tono* and *Cosnipata* rivers. To my great joy, the old Indian came down opposite to us, after being called by Leechler. In the morning early, we felled a tree across the *Tono*, where it cuts through a mass of rocks, and descending along the banks of that stream for some distance, we came to a smooth place in the river. Another raft was built which rescued the old Indian, but was also lost, and we saved the men by felling a large tree on the rocks to which they clung. The old Indian had eaten *all* he had the night we left him, and was now very hungry; he was delighted to get his coca, and handed me the cigars I gave him to smoke. He amused the other Indians, telling them how the white man had treated him. After following the *Tono* all day, we came to the river *Piñipiñi*, a stream as large as the *Tono*, with an average width of forty yards. I saw at once we could get no further, but it was a satisfaction to behold these two

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rivers, the *Tono* and *Piñipiñi*, join and form the head of the river called by the Quichua Indians *Amaru Mayu*, (serpent-river,) which Padre Revello had not long since named "Rio Madre-de-Dios," for the reason the Chunchos had killed a number of Creoles and Quichua Indians, and after destroying their little church, had thrown the catholic image into a tributary stream, whence it had floated down, and was found on a rock in the centre of Amaru-Mayu.

This stream is very swift, about seventy yards wide, and *not* navigable at the point I saw it, which is in latitude 12° 32′ south, longitude 70° 26′ west of Greenwich, and by barometrical measurement 1,377 feet above the Pacific ocean; showing a descent from the first flower on the side of the ridge in sight of 9,723 feet; small hills intercept our view of the river after it turns. Leechler informs me that the cascarilleros, from prominent places on this side of the Andes, have seen Indians crossing the "Madre-de-Dios" in canoes, among the islands, a short distance below us; and that the river is very winding in its course through a level country. The padre has seen a stream called "*Marcapata*," to the west of us, flowing northwest, which probably falls into the Madre-de Dios below.

The country is a beautiful one; well watered, and from its general appearance adapted for cultivation, though wild and unpopulated as far as we have seen, except by monkeys of different species, who are very busy in the evening cutting into the bamboo stalks for the water therein, which they take as *their* tea.

We feel great anxiety to visit the island in a Chuncho canoe; to make friends under the shade of a plantain orchard; to contract at the door of these Indians for a passage to the Amazon, and go home by this route. Besides, I wished to see the effect produced on these wild men by a present, from the padre, of angels, pictures drawn from a long tin box under his arm; but it is impracticable, and we lay down by the head of the Madre-de-Dios, to sleep till morning, with thirty-eight leagues by the road to travel back to Cuzco.

The ants troubled us. Before the break of day, we all rose suddenly from our sandy bed; the dogs skulking in with tails between their legs; all more or less uncomfortably aroused by the growling of two large tigers on the opposite side of the Piñipiñi. A light breeze was passing from us to them; they snuffed a breakfast, while the Indians silently hung their heads. I was looking upon the water, expecting to see them plunge in and swim towards us. Leechler examined my double-barrelled gun, and laughingly called out in English, "thank you kindly, the rains on the mountains during the night have flooded the Piñipiñi, and we, therefore, cannot breakfast together this morning."

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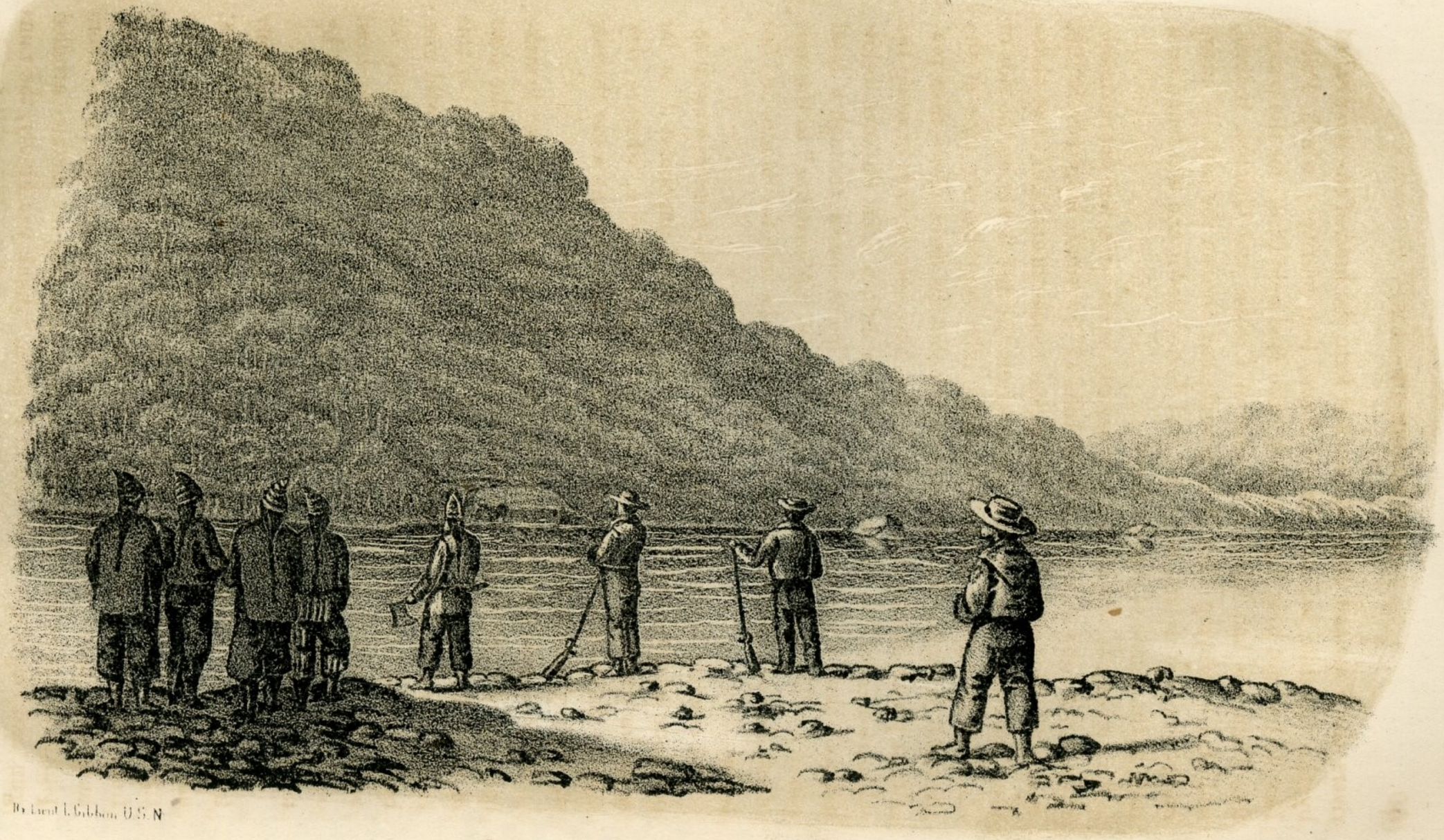

By Lieut. L. Gibbon, U.S.N

RIO MADRE DE DIOS

Lith. of T.S. Duval & C.º Phil.

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After *our* breakfast of boiled rice, we turned, and on our way saw the tracks of five Chunchos on the sands. Their feet are very small, and they walk with toes much turned in. They hunt in small parties of from five to seven, always accompanied by a woman, who carries their fish and game, cooks and does all the hard work, while they stroll along with their bows and arrows. They are very bitter against the Peruvians, and give them no quarters; waylay them on the roads to Porcotambo, and turn up their noses at all offers of friendship. We are on their hunting grounds. Here they find large fish, wild turkeys, and a species of pheasant, the size of guinea fowls. It is said they worship brave animals and reptiles, such as tigers and poisonous snakes; are generally smaller men and women than the Indians on the Andes. The inner corners of their eyes are turned down; they walk with their heads hanging; the expression of face is morose, without the least sign of a smile. Such are the reports of the men with me.

We halted at Chapemayo, which joins San Miguel, to see the old Indian safely in the hands of his wife, who had been told by the Indians, when we returned without him, that he was murdered by the Chunchos. The meeting was a very modest one.

José was delighted; the old man had expressed great fears that he would never see us again. The mules were in good pasture, but very much bitten by vampire bats, which strike them at night in the skin of the neck, and they bleed so much as to weaken them. The padre was very sad at the result of our reconnoissance. He was kind enough to give me an extract from a meteorological table he is in the habit of keeping. Three crops of corn may be raised here in one year, yet the people do not descend the Andes to settle in this productive country.

The farmer labors under great disadvantage. He never leaves his house in the morning to cultivate the field without fire-arms. They are at the expense of keeping a watch constantly stationed, lest they be surprised by the Chunchos. People are afraid to pass from farm to farm alone. Some have been murdered; others died from sickness brought on by fatigue, a hot sun by day, and loss of sleep at night. The coca planter generally leaves his wife and children behind him in Porcotambo when he enters upon his ordinary duties on this montaña.

I am told there are some cleared lands a short distance to the east of these four farms which have been abandoned, or rather nearly all were murdered by the Chunchos some years ago, and others have not ventured there since.

Upon gaining the top of the Andes, we found the barometer tube had been broken on the way. A hole was cut in the top of our coffee pot,

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large enough to insert a thermometer, and the height of the mountains determined by boiling water.

The day is pleasant, and we take our last blow and rest; the clouds lift, and while seated on the smooth top of a peak of the Andes, we see afar off to the east the magnificent view we have been anxiously expecting. The rich lowlands are looked down upon from a height of over nine thousand feet. It is like looking upon the ocean; those regular ridges trending northwest and southeast, decreasing in height as they increase in distance, seem like the waves of the sea rolling towards the mountains. The whole surface is covered with a beautiful growth of forest trees, whose foliage appears of a deep-blue color. Looking at the compass, following the direction of the northeast point, we see interruptions in the ridges, where the Madre-de-Dios cuts her way through the rollers towards the Atlantic ocean, striking them at right-angles. Upon looking at our map on the east, the river Beni flows in an easterly direction into the Madeira; and again on the west, as our previous remarks go to show, the Santa Ana empties into the Ucayali. We know that a great river pours from its four mouths a large quantity of water into the Amazon in latitude 4° south, and longitude 61° west, where it is called the river Purus. The geographical position of the Madre-de-Dios forces us to believe it to be the same as the Purus. This is a matter of importance. If it is navigable for steamboats to where we now see, it forms the natural highway to South Peru. All the silver and gold of Peru are not to compare with the undeveloped commercial resources of that beautiful garden. The wealth, strength, and greatness of a nation depends upon a well-cultivated and productive soil and people, aided by commerce and manufactures. Veins of gold or silver run out; without other industry, poverty follows, particularly where the people have been principally schooled in poetry and Latin grammar, as found to be the case on some parts of our route.

Leechler tells me he has not heard his own language spoken for ten years; that he would like much to go with me; "but," said he, "I have a wife and two fine boys in Porcotambo." He has been of so much service and stood by me in my troubles, that I feel inclined to sit still and talk with him in plain English. The cascarilleros have seen islands in the bed of the Madre-de-Dios. During the rainy season the mountain torrents wash away the soil about the roots of large trees; a tree falls into the stream, and is carried away by the waters; that tree is borne rapidly down until it reaches the level country, where the current of the larger river runs slow; there it turns up-side down, the branches sink, and the roots stick out of the water; the branches evidently hold

to the bottom of the river, while earth and sand are heaped upon them; drift-wood and vegetable matter catch in the roots or lodge against the trunk. This is work by the laws of the Almighty. A little island is thus built; it grows larger and larger every year; as it increases in size, in the middle of the river, it occupies space which before was covered with water. The same body of water must pass; as it does so, it cuts a deeper channel, while it also caves away the banks, whose earth and growth are carried farther down by the freshets. One channel grows larger than the other; the smaller one probably fills up, and then our island is lost by its attachment to the main land. Should the river be large enough to float a vessel, and there be no falls between it and the sea, that island is the head of navigation. Suppose it is in latitude 12° south, longitude 70° west, of Greenwich, the distance from the island to the mouth of the river Purus is 735 miles; course N. E. ½ E. from the mouth of the Purus down the Amazon to the sea, a straight line is 806 miles; course E. N. E. ¾ E. 735 + 806 = 1541, which distance a steamer can run in six days. Triple this time for turnings and stoppages for fuel, we have eighteen days then from the mouth of the Amazon up to this island.

A ship, loaded with woollen and cotton goods, and with hardware ploughs, and farming utensils—of which there are none, except some miserable old *muskets*—with corn, rice, buckwheat, hemp, tobacco, all kinds of flower and garden seeds, plants, vines, and shoes, would require twenty-five days to the mouth of the Amazon, eighteen days to the island, and ten days to Cuzco: in all 53 days. On the route travelled at the present day, by Cape Horn to Yslay, on the Pacific—the nearest seaport to Cuzco—the passage would occupy 105 days, and 15 days from there to Cuzco: in all 120 days. *Time* with merchants is money.

But the great river must be explored from its mouth up. When we swam across the Cosnipata, with our bamboo balsa, I lost my straw hat in the middle of the stream. Should it be found in the mouth of the Purus, I shall hereafter maintain that *it* is fully entitled to the honor of having decided that the Cosnipata is a tributary of the Purus. The India-rubber trade is increasing every year. It is now the most important export from the Amazon, and is destined to be of much greater value. Few trees are found near us.

The mules being well rested and fed on the mountain grasses, we overtook a red-haired, thin, sallow-complexioned man, slowly walking after an old horse, loaded with Peruvian bark. This was a cascarillero returning from the labors of the season in the forest. He had been sick, and went homeward with a slim reward. He presented a striking contrast

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to his wife, who met him with the horse. She was a smiling negress, very black, with beautifully-white teeth, who had been a slave, but bought her freedom when her former master died. He left her money, which the cascarillero married and spent for her.

We rode into Porcotambo late by moonlight. An Indian girl took me into the sub-prefect's room, where he and his wife were in bed. I drew back surprised, but not in time to escape being seen. He and his lady called out to come in. I apologized through the door; this was not considered necessary; they both insisted upon my entering. As they sat up in bed, I, in a seat close by, answered their many questions, while the servants prepared supper and bed for me in another room. The amount of fancy-work about a lady's nightcap was becoming to dark hair and eyes. Women, I find, are much interested in steamboat navigation and the productions of other countries. This town is remarkable for beautiful señoras.

At the end of the sixth day, from the head of the Madre-de-Dios, we arrived in Cuzco, after an absence of twenty-one days. Richards was still much reduced, but gaining health. The prefect expressed his regrets at not being authorized to send troops with me, and asked the favor of a written account of my visit to the east, in behalf of the Peruvian government.

CHAPTER III.

College of sciences and arts at Cuzco—Students—Library—Popularity of Fenimore Cooper's works—Convents—Cock-pits—Procession—Condition of the aborigines anterior to the Incas—Manco Capac and his wife—Their language—Antiquities—Inca's fortress—Worship of the planetary bodies—Suspicion of intercourse between ancient civilized Asia and South Peru—Temperature of bull's blood—Reception of the prefect's family—Sham fight among the Quichua Indians—Barley and corn crops—Trade—Loss of Paititi—Thermal springs—Hospitality of a cura—Lampa—Gold mines of Carabaya—Lake Titicaca—Appearance of the Indians—Puno—Military—Niggardly soil.

The city of Cuzco has a population of about 20,000, with a greater proportion of creoles than any place between it and Lima. There is but one newspaper published—an official called El Triunfo del Pueblo, (the Triumph of the People.)

In the museum are many ancient curiosities: mummies, mining tools, earthen, stone, and metal ware, war-clubs, hatchets, and Indian costumes. In a small library hangs a translation, into Spanish, of the declaration of independence of the United States. Among the few readers met there, questions were often asked of Fenimore Cooper, who seems to be better known in South America than any other North American. I received much kindness from those of Spanish descent who had read Mr. Cooper's works. The distinct pronunciation of his name shows the deep impression made upon their mind by that distinguished author.

In the college of sciences and arts were three hundred boys. The president seemed anxious to give a favorable impression of the institution. In the picture gallery, some of the most choice drawings, executed by the students from time to time, were preserved. There seemed to be natural talent displayed, but a want of good instruction. Mathematics, philosophy, Latin grammar, and drawing, are the principal studies. While walking on the balcony among the boys, wrapped up in broadcloth cloaks and caps, we observed a youngster deeply interested in a very greasy-looking little book. He seemed to be the only one disposed to study. He said, "*Poetry* is my lesson for to-day." He was asked which he preferred to be, a Byron or a farmer? The boys around us laughed, when he spoke out quickly—"a Byron, sir." On the wall of a dressing-room hung in line three hundred Napoleon-fashioned cocked hats, which the president informed me were worn by the boys in proces-

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sion when they went to pay their respects to the prefect. Peru has a population of not quite two millions, more than half of which are friendly aborigines. On the standing army list there are six "Grandes Mariscales," seven "Jenerales de Division," with twenty "Jenerales de Brigada," and junior grades in large proportion.

The people of the country complain of a constant revolutionary spirit in all places, and there is no advancement in "science and the arts." It is said that when a creole mother in this country holds her baby between her hands to tickle and kiss it, she addresses a boy as "My dear little Bishop;" or, "My President." She objects to allow its head to be wet with water, for fear of destroying its memory; and prevents it from sleeping in the day-time, lest it may catch a sore throat. The birthday of a boy is a cause for rejoicing. The father is congratulated, and the mother praised for her patriotism. The proportion of females through this country is great. The women are well developed, healthy, active, and gay. *Generally* speaking, the men are not so.

Every Sunday evening there is a cock-fight in Cuzco, at fifty cents entrance. The pit is built of mason work, with two entrances, and seats, one behind the other, all round. Gaffs, three inches long, sharp, and like a dragoon's sabre, are fastened to the cock's spurs; the fight is very soon decided. A good deal of money is bet on these occasions, at which the college-boys take part; ladies are not admitted, though they bet upon their favorites as they are carried by to the pit. The commander of police presides in uniform, with a small table before him, covered by a green cloth, on which he makes his bets, and piles his silver and gold, if he wins. He rings a small bell when he is ready for the fight to commence, and decides the battle. There are few game chickens in this part of the country, but the barn-door fowl, aided by gaffs, are freely used up.

A visit to the churches and convents of Cuzco is interesting; many of them are immense, built from the hewn stone from the ruined Inca city. The ornaments are rich and costly; the carving of ornamental woods from the montaña are well executed. We were surprised to find such a display of oil paintings, which were used to induce the Indians to change their worship to that of the Catholic. In the convent of San Francisco, one represented a graveyard somewhere between Heaven and hell; the dead are seen rising; winged angels come down from among the clouds, and bore off the good people; while the devil's understrappers grasped the bad, and tossed them over a precipice into an active fire far below. This painting produces a lasting effect upon the minds of the poor Indians. A major in the Peruvian army remarked "he saw

no *soldiers* in the *fire;*" at which a polite fat padre laughed, as if he did not consider the subject in a *serious* light. In one corner of a filthy room, near a closet, a robed priest was standing with a small book in one hand, and a large loaf of bread in the other. He looked ashamed as he saluted us with his mouth full. Among the flowers cultivated in the area were a number of priests apparently in deep study, while one of them was mending a hole in his breeches.

After a long continued drought, the sugar plants, maize, and potatoe crops suffer for want of rain. On Sunday, August 31st, the prefect invited us to walk in procession; a company of soldiers, and band of music in front; the college boys, with cocked hats, and their happy-looking president, were ready; the prefect appeared in full uniform. We marched to the cathedral, which, with the main plaza, were filled with people. On entering, no seats had been provided, and the prefect spoke sharply to one of the priests. Three images, of full size, were raised on platforms on the heads of men; the music commenced, and we followed through the city. The Indians, who crowded from the surrounding country, seemed very much interested, but it was *wood-work* to some of us; with hats in hand we pushed through.

We halted in a narrow street, to allow another procession to pass, similar to ours, except that it had a more interesting mixture of pretty women. An image, borne on the heads of men, was called "El Patriarca San José," followed by a number of priests and women singing. After them a female figure, richly mounted with silver, dressed in a costly brown silk dress, trimmed with gold, and spangled with silver. Her black hair was hanging gracefully at length over her shoulders, and in her arms she held an infant. We followed "*Nuestra Señora de Belen*" to the cathedral. The bells announced her arrival, and the population knelt in prayer.

Nuestra Señora was carried before the altar; those under the front part of the platform knelt and rose three times, while the men behind stood still, which made her appear as though bowing. When the Indians shouted and cried, the women became much excited, and their little children shed tears and screamed with all their might; even the Indian men wept; a perfect shower of tears was produced. Their prayer to God, through Nuestra Señora de Belen was to send rain for their perishing crops in the country around.

Soon after the conquest, the fishermen of the bay of Callao picked up a box, and upon opening it they found Nuestra Señora de Belen and her child, with a letter, wherein it was written, she was intended for the "City of the Kings;" Lima was Pizarro's name for the city of the

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kings, and she was at once claimed by that city; but Cuzco was the aboriginal city of the kings, and a dispute arose. Those of Cuzco declared, that as she came in a box, which might be carried across the Andes on the back of an ass, she was not sent to Lima. This argument gained the lady, and she travelled over the mountains.

The Indians, and many of the creoles, believe, when they have too much or too little rain for their crops, and take her through the streets praying, God will listen, and send water, as required, for their fields. When they are visited by disease, as at present, and the influenza is fatal to their children, the Belen lady is implored.

The Convent of San Domingo is built over the ruins of the *Temple of the Sun, Moon, and Stars*, which were worshipped together by the old Peruvians—a worship objected to in moral laws. We are told that the sun of the temple was made of a mass of silver and gold; so were the moon and the stars. When the Spaniards captured Cuzco the treasure of this temple was squandered at the gambling tables.

Before the days of the Incas, the Indians of these regions are thought to have lived in holes in the ground, in crevices, or under overhanging masses of rocks, and in caves, like wild bears, biscachas, or eagles. They ate grass and roots of the earth like beasts; roamed among each other as animals of the desert. Like the Chunchos, they reverenced brave animals, large birds, and serpents. There were many tribes, with different languages, and different worships of birds or beasts. In war they flayed their prisoners, ate their flesh, drank their blood, made drum-heads of their skins, and sticks of their bones. They went about in flocks, robbing each other like wolves, the weaker giving way to the strong. It has been said they fattened the children of their enemy like lambs or calves, and ate them.

A man and a woman of some different race suddenly appeared among them; they knew not from whence they came; the opinion was that they were from out of the great Lake *Titicaca*. The man and his sister told the Indians they had been sent by their father, the *sun*, to draw them from their savage life, and to instruct them how they might live like men, and not like beasts; to show them how to cultivate the land and raise food; to teach them to make clothing and to wear it. The Indians were pleased, and ran off telling their neighbors, who gathered together about the man, while his sister and *wife* taught the women how to spin the wool of animals and to make clothing.

The language taught them was called *Quichua;* they were also instructed to worship the *sun*, *moon*, and *stars;* to build towns on the western end of the valley; to rise at the break of day, that they might

behold their Deity as he appeared in the east. They called the man *Manco Capac* and Inca; they loved and worshipped him as a descendant of the sun. The woman they called *Coya Mama*.

Manco Capac reigned many years, during which time he and his wife taught the Indians from the *Apurimac* river on the west to the *Porcotambo* river on the east; south from Cuzco to Lake Titicaca, and north to where the Apurimac empties into the Santa Ana.

The moon was worshipped as the sister and wife of the sun, and believed to be the mother of Manco Capac; the evening star, Venus, was considered the attendant of the sun. They respected the cluster of "seven stars," because they were called maids to the mother moon.

They had certain forms of worship and prayers which were made through lightning, thunder, and the rainbow.

Manco Capac was kind and gentle in disposition, and the Indians loved and obeyed him. He laid the foundation of great changes in the manners of the aborigines, founded a church and a nation.

I was permitted to make sketches of some curious things, the works of the ancient Peruvians, from collections preserved in private families, who value their little museums very highly; they seldom give away a specimen, but are anxious to receive anything in addition.

FIG. 1.

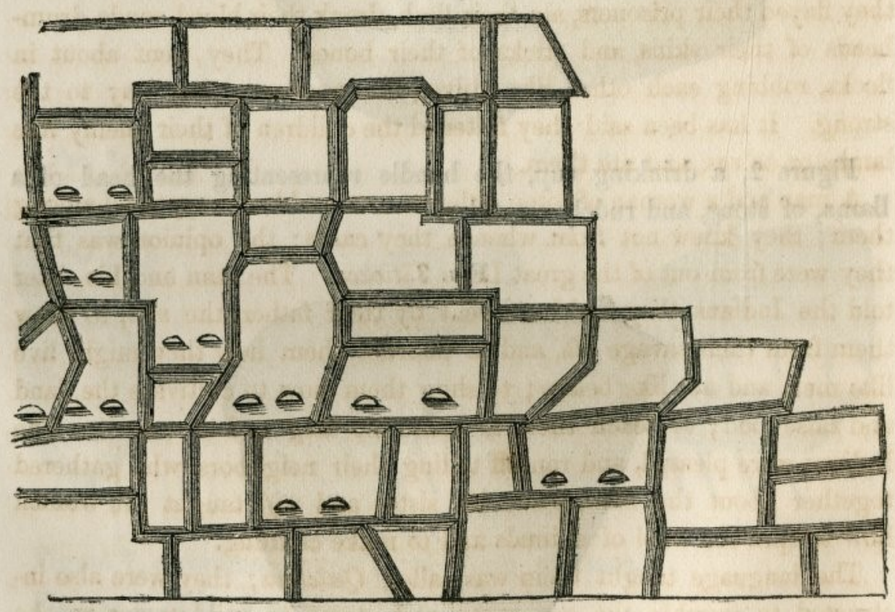

Figure 1 represents mason-work.

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Fig. 2.

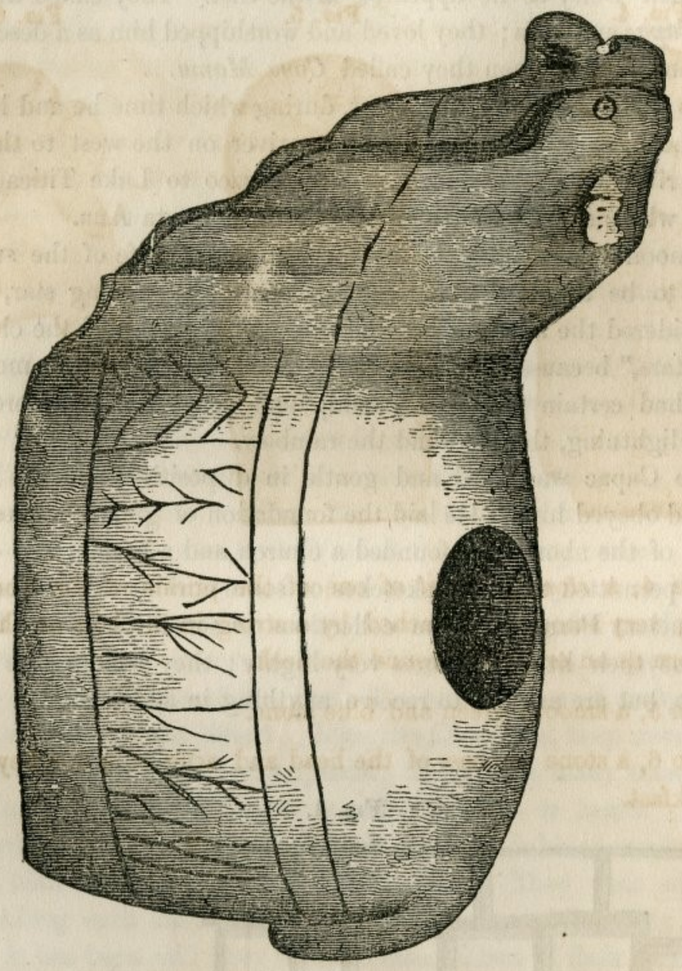

Figure 2, a drinking cup, the handle representing the head of a llama, of stone, and rudely carved.

Fig. 3.

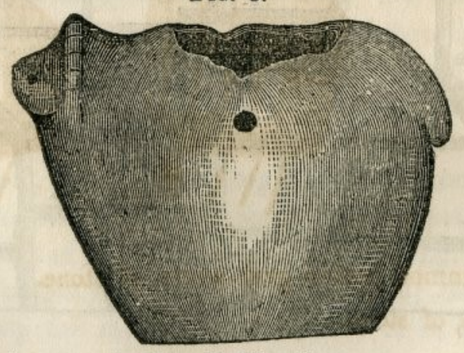

Figure 3, also stone, probably of older date.

Fig. 4.

Fig. 5.

Fig. 6.

Figure 4, a *stone portrait* of one of the priests of the Temple of the Sun; very smooth. Attached by a string in the hole on the head, to be worn as an ornament round the neck.

Figure 5, a smooth green and blue stone.

Figure 6, a stone likeness of the head and arms of a monkey eating his breakfast.

Fig. 7.

Figs. 8.

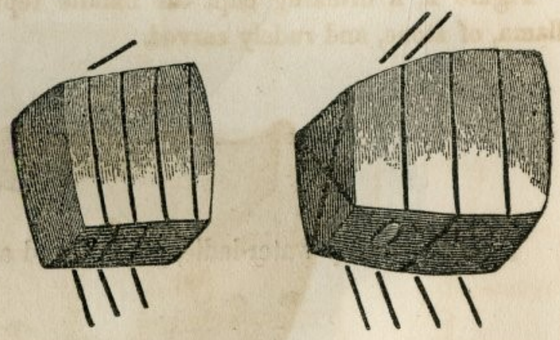

Figure 7, a common garden grub-worm, of stone.

Figures 8, dice, of stone.

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Fig. 9.

Figure 9, a clay water-ladle, painted red and worked very smooth.

Fig. 10.

It is said that such idols were not permitted to be worshipped by the Incas. They are of *granite*, found among the Andes—not from the Cordilleras. In Peru and Bolivia, the Cordilleras are not interrupted by water-courses, but are the dividing lines between the Atlantic and the Pacific watersheds; while the Andes chain is cut in many places by the streams flowing to the eastward.

Fig. 10.

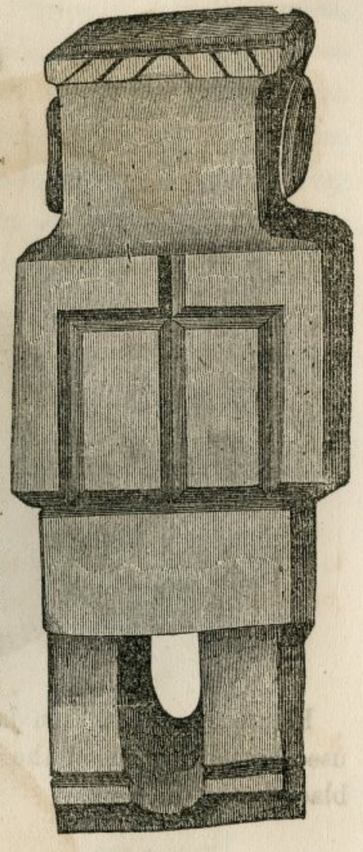

Fig. 11.

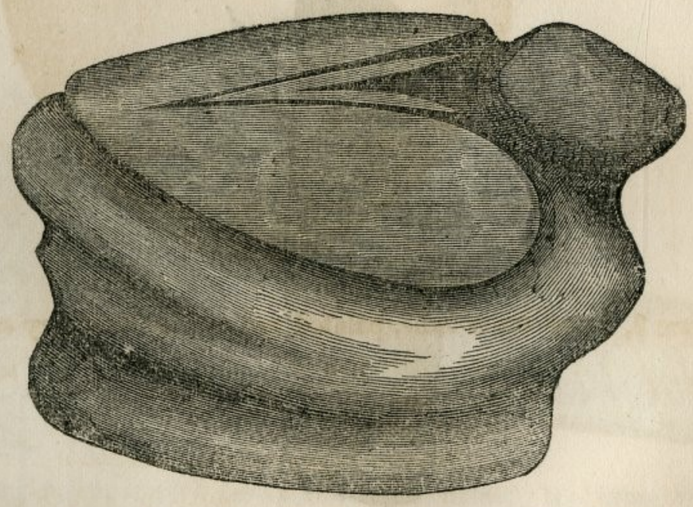

Figure 11 is of granite, bird-like in shape. It might have been made for the head of a war-club or slung-stone.

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Fig. 12.

Figure 12, an earthen jar, seems to be more modern, though not used by the Indians of the present day. It is of brick-color, painted black round the neck.

Fig. 13.

Figure 13, a green-colored stone likeness, worn suspended on the breast.

Fig. 14.

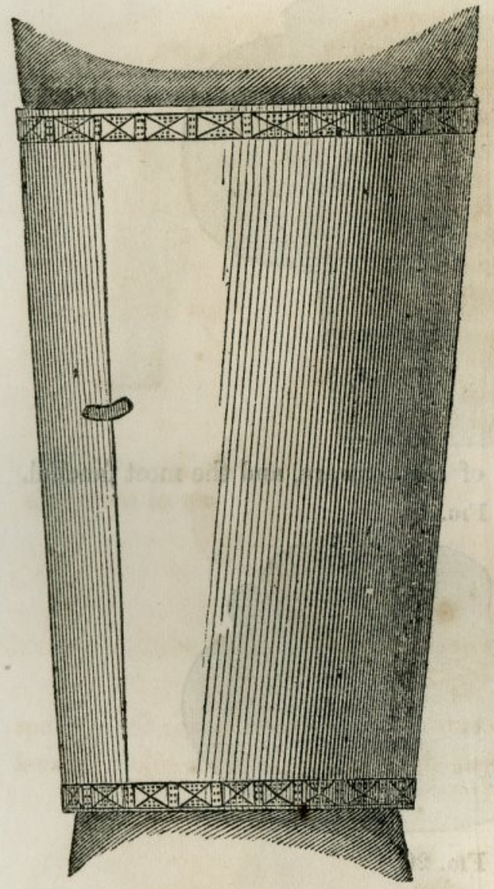

Figure 14, a metal armlet, made of copper and tin, so thin as to spring open when drawn over the hand. The fastening is a small string through the holes. Bracelets *were* favorite ornaments: they are seldom worn in the present day.

Fig. 15.

Fig. 17.

Fig. 16.

Figures 15, 16, and 17 are of the same metal; the latter the best representation of a llama we could find; the two former are in the usual posture of mummies.

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Fig. 18.

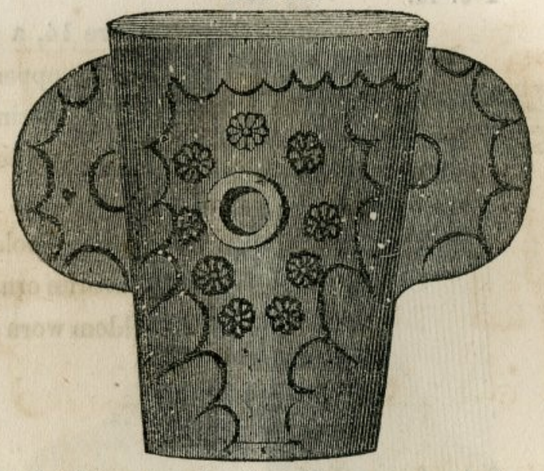

Figure 18, a drinking cup, is of earthenware, and the most fanciful.

Fig. 19.

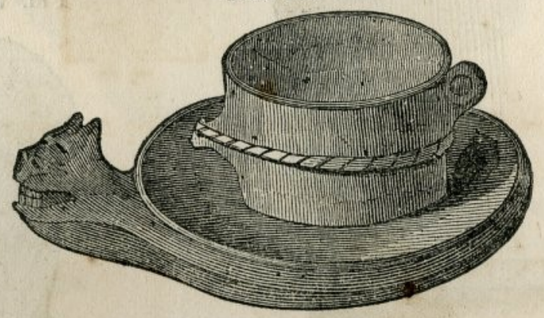

Fig. 20.

Figures 19 and 20 are of stone. The general contour of figure 20 reminds us of the alpaca; while the handle of the saucer of figure 19 represents an animal unknown to us.

Fig. 21.

Fig. 22.

Figures 21 and 22 are of stone. Figure 22 represents an animal unknown to us.

Fig. 23.

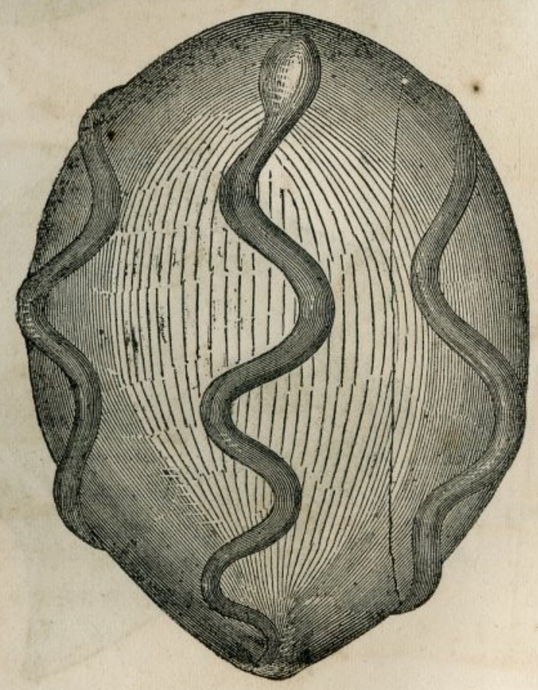

Figure 23, a stone, shaped like a lemon, with serpents carved thereon, including a vein of gold in the stone, the production of the montaña of the Madre-de-Dios.

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Figs. 24.

Figures 24 represent paintings on the outside of an earthen jar, red and black.

Fig. 25.

Fig. 26.

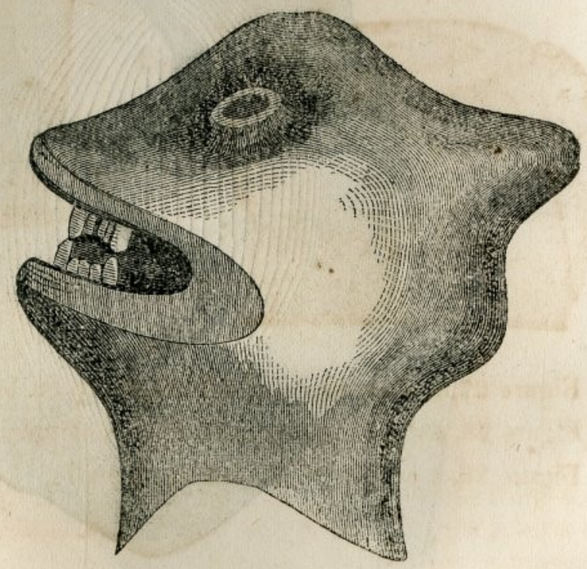

Figure 25, of stone, may be a caricature of a bearded Spaniard in his smoking cap.

Figure 26, of clay, is the head of an animal unknown.

Fig. 27.

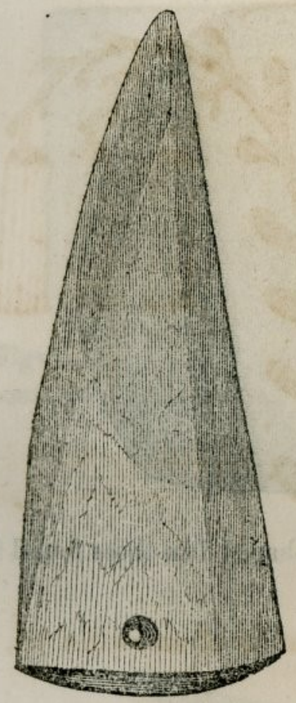

Fig. 28.

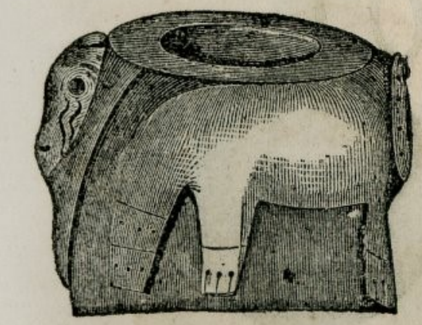

Fig. 29.

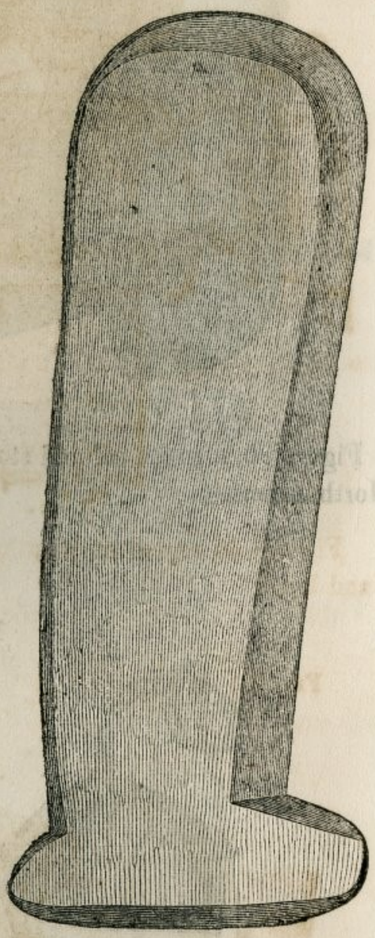

Figure 27, a stone blade of a knife, sharp on both edges.
Figure 28, a drinking cup, with figures of animals.
Figure 29, a copper chisel, flat on one side.

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Fig. 30.

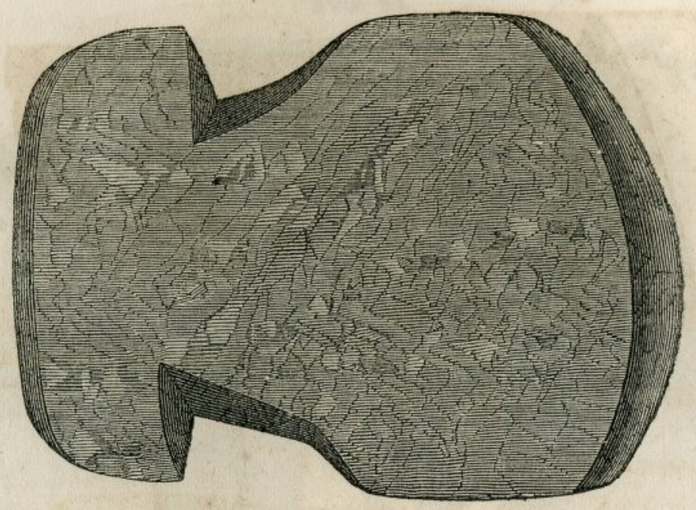
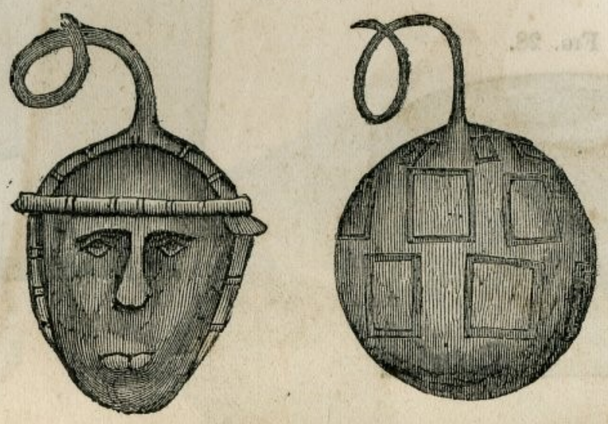


Figure 30, a green-colored stone hatchet, shaped like those found in North America.

Figs. 31.



Figures 31, ear ornaments. Their weight stretches the ear. They are of copper and tin, inlaid with silver and gold, and were hung to the ear by the string. From their appearance, not owned by the common Indians.

Fig. 32.

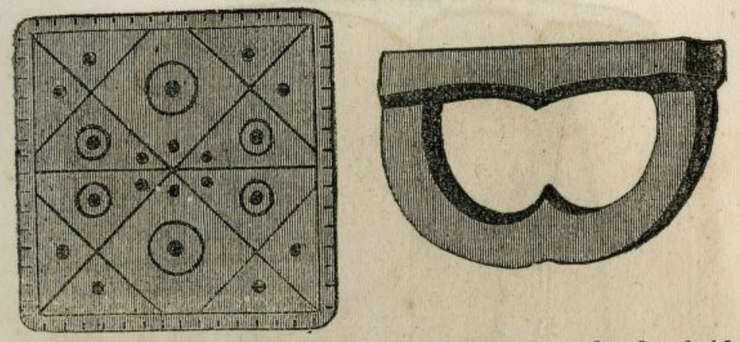


Figure 32, a bone wedding-ring, made as though the bride and groom *both* wore it during the ceremony.

Fig. 33.

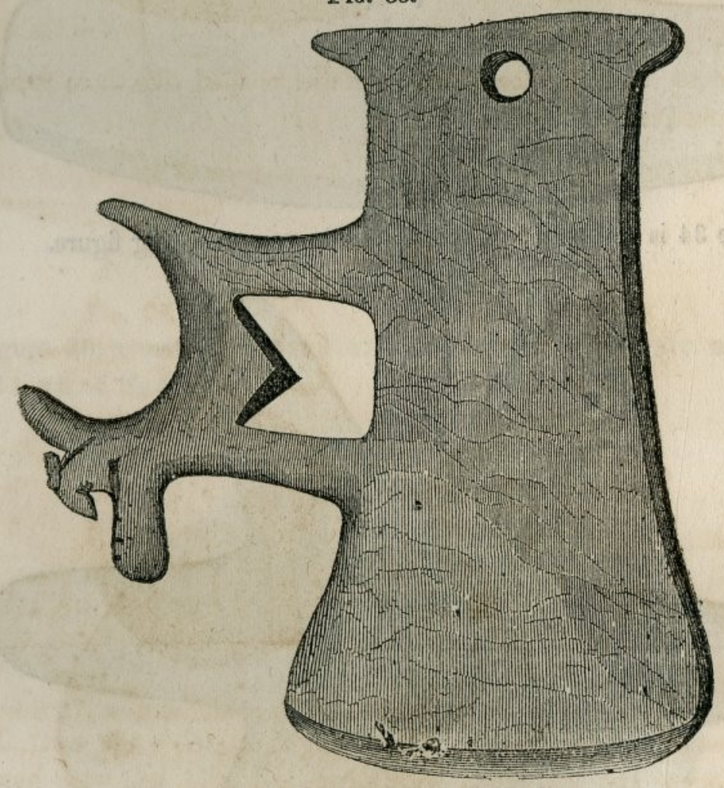


Figure 33, a hatchet, made of copper, hardened with tin. This was found in the grave of an Indian warrior, near Cuzco, and is the best made tool we found. Iron was not in use, and their tools were made of this mixed metal. They probably cut stone with it. Dozens of crowbars or chisels, 3 feet long and $\frac{3}{4}$ by $\frac{1}{2}$ an inch thick, were found in the silver mines.

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Fig. 34.

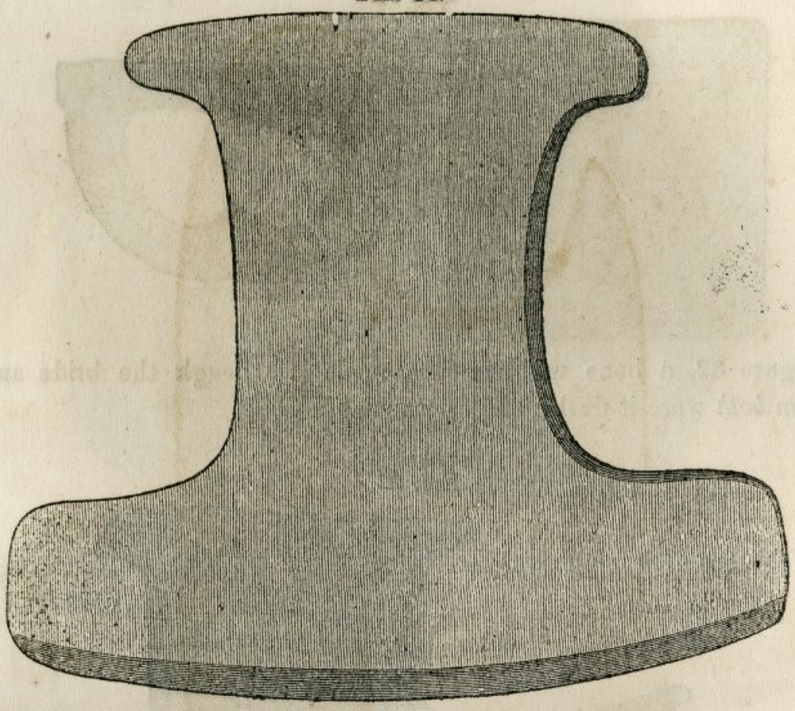

Figure 34 is a hatchet, of the same alloy as preceding figure.

Fig. 35.

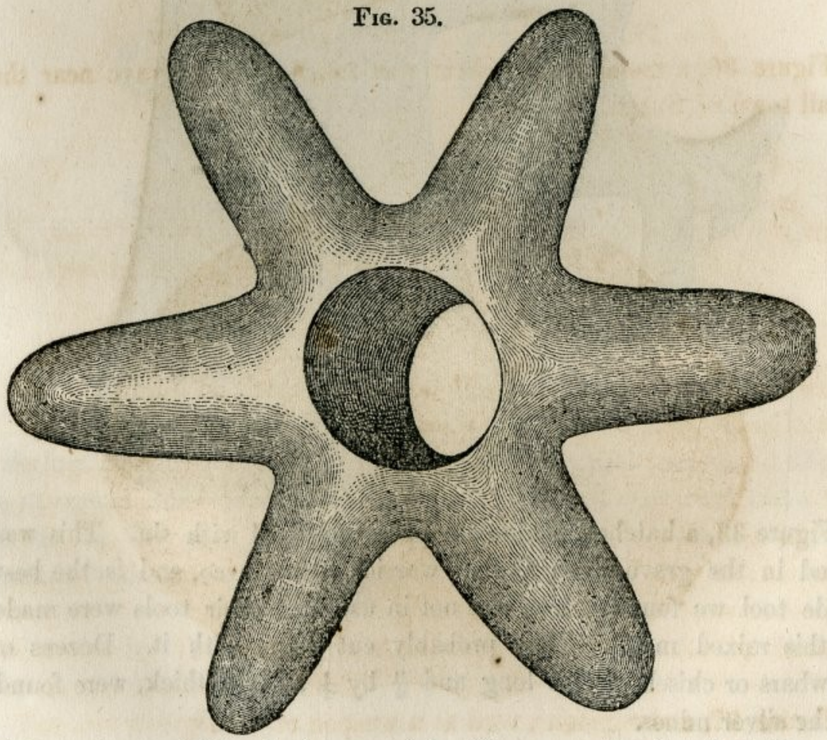

Figure 35, metal head of a war-club. Some are also found of stone.

Fig. 36.

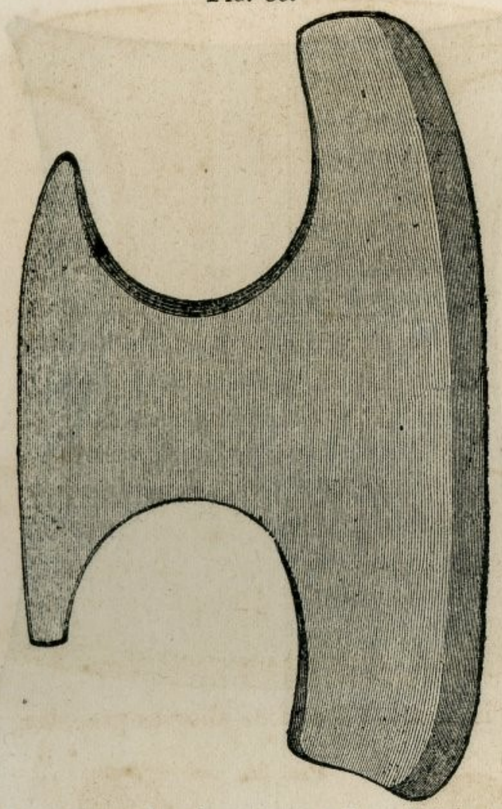

Figure 36, a metal war-hatchet; was taken from a grave near the small town of Surati.

Fig. 37.

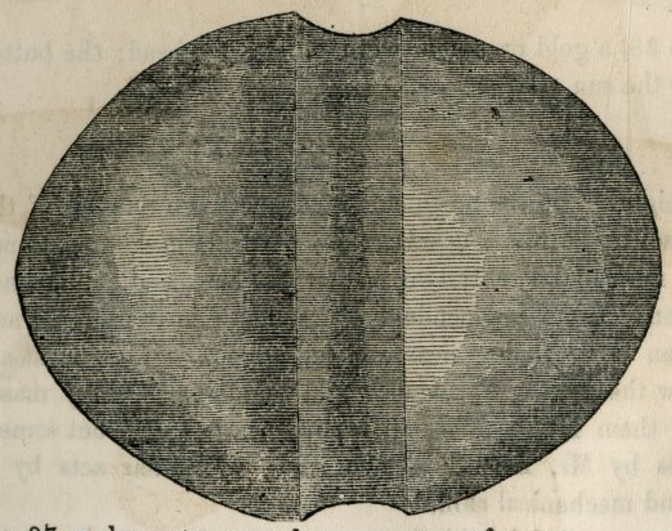

Figure 37, a slung-stone, used as a weapon of war.

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Fig. 38.

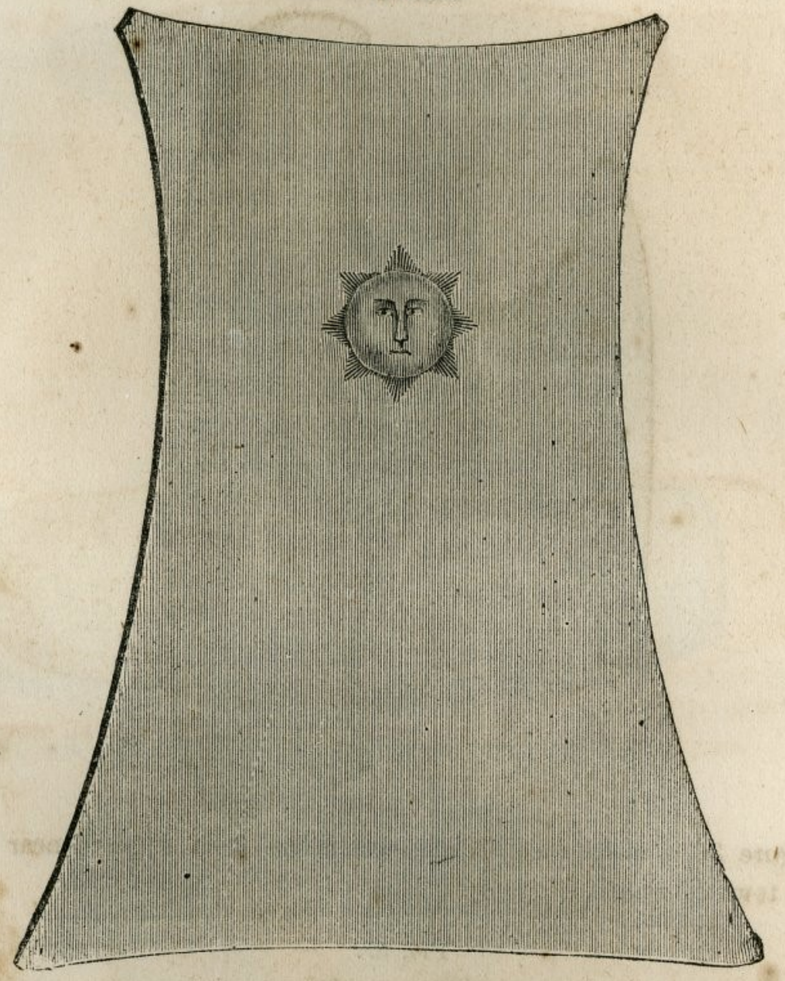

Figure 38, a gold ornament worn on the forehead; the button, representing the sun.

On a high hill on the north side of the city are remains of the walls of the ancient fortress *Sacsahuamam*. The largest sized stone in the drawing measured twenty-two feet at the base, and twelve and a half feet perpendicularly, independent of its depth in the ground and wall. The Indian boy standing near was full grown. We were at a loss to know how the ancient Peruvians could handle such heavy masses, and transport them half a mile over ground nearly level; but some recent discoveries by Mr. Layard, in Asia, show no similar acts by human powers and mechanical skill.

The area occupied by this fortress may be about twelve acres. No

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By Lt. L. Gibbon U.S.N.

Lith of P. S. Duval & Co. Phil.

NORTH VIEW OF THE REMAINS OF THE INCA'S FORT, SACSAHUAMAM. Cuzco.

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fortification in North America would more safely defy the effects of round shot and shell, though built by people ignorant of such war agents. The angles and ground-plan are systematically laid down; the stairways, by which the fort was entered, are built so as to be easily shut up by large stones from the inside, making the door quite as secure from the outside as the wall itself. The walls encircle the top of the hill, the peak of which stands considerably above the ruins. On the north side of the ruins, from which this view was taken, there are many seats and flat places carved in the rocks, whence it is supposed people witnessed plays on the flats, which have the appearance of parade-grounds. Among these rocks there is a hole, said to be the entrance to a subterraneous passage under the hill to the Temple of the Sun, a distance of half a mile. I entered it, but could not proceed far, and came away with doubts. Subterraneous roads, made by the order of the Incas, are believed by some to exist between Tarma and Cuzco.

In the small stream flowing by this fortress, and through the city of Cuzco, I washed some sand in a pan, and found grains of gold. The Indians now seek the cultivation of the soil rather than gold-washing, and find it more profitable. During the reign of the Incas, the precious metals were solely used by them as ornaments and utensils, and not for a currency, as now.

From time to time, during the reign of the Incas, the neighboring tribes of Indians were brought under their control, either by persuasive means or by force of arms, until their territory extended from the Pacific coast on the west to the eastern slope of the Andes, and from Quito, near the equator on the north, into Chili, near latitude 40° south. Some of these Incas were great warriors, who marched to the frontiers with a determination to extend their laws and religion over other territory, until their possessions became so great, that the twelfth Inca decided to deviate from the constitution established by the first, and gave the southern portion of the kingdom to his eldest, and the northern portion to another son. These brothers quarrelled. Francisco Pizarro took the conqueror prisoner and had him hung, which completed the fall of the Peruvian empire, the civilization of which yet astonishes the Spaniards.

I met an old woman in Cuzco who claimed to be a descendant of the Incas family. She was unable to trace the account of descent farther back than her own mother. Old ladies tell their children wonderful stories in this part of the world. Those who claim to be of the same blood as the Incas, assume a haughty manner towards their neighbors, which becomes the Indian as little as other people. In the ruins of forts, roads, and canals, the art of spinning, weaving, and dyeing,

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curiously-carved stone tools and metal castings, are the true remnants of the Incas. The people seemed to fancy the hewing of stone and working in metals, but we find no traces of wood-work.

The Spaniards brought with them to Peru horses and mares, horned cattle, asses, goats, hogs, sheep, tame cats, coins, and dogs of good breed. They planted the grape vine in the valley of Cuzco, made slaves of the Peruvians, who joined to hurl their oppressors in their turn from the territory of Peru.

A traveller told me that in 1825 he could read the news of the war in the *faces* of the Indians as he met them on the roads. If a battle had been decided in favor of the republicans, the Indians looked up and were cheerful; if in favor of the others, they hung their heads and were sad. The histories of hard fought battles between their forefathers and the Spaniards, and the overthrow of their religion and government, had been handed down from generation to generation. Various changes of manners and customs had interfered with their happiness. The *natural* man never forgets an injury, and it seems characteristic of the Indians, as well as of some others, to hate their enemies and to love their friends. These people enjoy the recollection of the example of Manco Capac to this day. He seems to have shaped his conduct to the *disposition* of the nation.

The worship of the planetary bodies, "the sun, moon, and stars," is some evidence of astronomical information, which gave its votaries power over others, ignorant of the natural laws which regulate the movements and periodic changes of these heavenly bodies; and thus gradually enforced a perverted reverence for them by the multitude.

The Hebrew moral law specially objects to such worship, which appears to have been *previously* known, and, *therefore*, was forbidden by Moses.

During preceding revolutions, which are referred to in the scriptures, ships employed in commerce between India and Egypt may have been driven from the Persian gulf or Red sea, and have reached this continent.

A remnant, one man and one woman, well educated and instructed in the arts of agriculture, mechanics, and domestic industry, would have effected all the improvements shown by the education of an intelligent race, as the Peruvians appear to have been.

Their customs, manners, and enterprises, assimilate so much with those of remote antiquity, in Asia and Africa, as scarcely to be distinguished from them.

Modern discoveries in Egypt and Assyria exhibit the same bridges and idols, the same tools, weapons and utensils of clay or stone, and of *mixed* metals—copper hardened by tin.

What things are dissimilar may have been the result of intention and reform. The victory of Alexander the Great over the Tyrians, who were active, enterprising, and *intelligent* navigators, and the description of explorations to the Arabian sea, made by ships built upon the Indus, authorize a suspicion of very ancient intercourse by some competent means between civilized Asia and America, at the south, as well as by northern navigators upon our eastern coasts.

In evidence of ancient art and contrivance, when Alexander besieged Tyre, more than three hundred years before our era, he employed "*chain cables*" for his ships, after the Tyrian divers had cut the rope cables and set his vessels adrift.*

The hitherto recognised dates are not considered competent to compute the period of man's existence on this earth. *The original* estimate being possibly founded upon a different basis of calculation, similar to the comparison alluded to by a sacred writer: "A thousand years in Thy sight are as yesterday when *it* is passed."

The existence of a strange pair of foreigners, who arrived from some unknown country, to introduce agriculture, arts, manufactures, and systematic morals, among the native tribes of the Andes, does not appear to be a traditional fiction, but a confirmed fact, in the history of the aborigines of Peru.

The grateful recollection of the present race of Indians, for the kindness, gentleness, and humanity of the Incas rulers towards their ancestors, are often compared disadvantageously with the sufferings and privations they think they experienced from subsequent governments, now modified, by peculiar changes.

The writer cannot doubt that Manco Capac and his wife were realities. Long voyages, attributed to a commercial people of very ancient date, may authorize an attempt to show the possibility of the discovery and improvement of the aboriginal people, distributed upon this portion of our great continent, by some race versed in arts and knowledge, descended from the Asiatic family, to whom primitive advances in civilization have been most anciently attributed.

The Phœnicians are described to have made voyages from their colonial settlements on the shores of the Mediterranean, to obtain amber from the Baltic, and tin from the British islands.

These Phœnicians, originally passing by the waters, or along the shores of the Euphrates, from the Persian gulf to the Mediterranean

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* Williams's edition of the Life and Actions of Alexander the Great.

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sea, are stated by tradition to have introduced agriculture, manufactures, arts, letters, architecture, and civilization, to the aborigines of Europe and of Africa, in "the antiquity of ancient days."

The colonies of Sidan and Tyre in Asia, of Carthage in Africa, and some on the European shores, in Greece, Italy, and Spain, have been attributed to these remote people. They are described in our venerated records as the merchants, navigators, and wise men of their distant age.

To pass the stormy Bay of Biscay, and encounter the boisterous seas of the Northern ocean, these explorers must have possessed vessels with officers and equipments, experienced pilots, and competent seamen, to authorize suspicion of enterprise, intelligence, and powers quite sufficient to lead them "to compass the earth."

The three years' voyages described in the Scriptures to have been undertaken by Tyrian seamen, and the valuable productions enumerated as portions of their cargoes, illustrate the mercantile character of that age, confirmed by curious modern discoveries in Egypt and Assyria.

In the hazardous voyages of the Phœnicians, in search of tin, we discover some proof of its importance in the arts and manufactures of antiquity, more than equivalent to its uses at the present day.

The comparative absence of steel and iron tools among the relics of ancient nations, may be explained by the fact that they possessed a substitute in the easy combination of tin with copper, which, by accident or their accurate acquaintance with these metals, enabled them to produce results in the arts which still astonish us.

The immense rocks removed, ornamented, and elevated upon ancient temples and pyramids, or carved in their natural positions for habitations of the living and cemeteries for the dead, have long believed to have been wrought without the employment of iron tools. Bronze was certainly fabricated at very distant periods for the same uses as steel and iron now.

Layard describes ornaments, weapons, tools, and armor of the ancient Assyrians of copper "hardened, as in Egypt, by an alloy of tin."

The natives of Peru executed some significant works in porphyry and granite, hewn by similar implements of bronze or copper, tempered by a small alloy of tin.

By means of such tools, they wrought hard veins of silver, and are supposed to have engraved the emerald.

M. de Humboldt carried with him to Europe a chisel, from a silver mine opened by the Indians, not far from Cuzco, which, upon analysis, was found to contain ninety-four parts of copper, united with .06 of tin.

The writer has been enabled to procure the partial examination of a

bronze crowbar, or long-handled chisel, from an ancient mine of silver in Peru. An exact analysis has been delayed, but of from ten to twelve per cent. of tin are understood to be combined with the copper.

This alloy is employed for casting of bell-metal and cannon, for the touch-hole of muskets, mirrors, or specula, for astronomical observations, musical instruments, and formerly for coats of impenetrable armor.

These affinities in the manufactures of the Egyptians, Assyrians, and ancient Peruvians, offer some suggestions of very remote intercommunication between portions of civilized Asia and the natives of the Andes, further elucidated by reference to other similarities in their mode of agriculture by irrigation, and the employment of manures; the construction and suspension of bridges; their causeways and aqueducts; the working of mines, knitting, netting, spinning, weaving, and dyeing; their roads, posts, inns, and grainaries, arms and armor.

The order, system, and policy of their morals; the arrangement of public records; their duties; the worship of the sun, the moon, the planets, and natural elements, distinctly and strictly forbidden in Hebrew laws, because such practices had existed before the Exodus, and, therefore, were objected to in the reformed code.

Indeed, the resemblance in the manners and customs of the Peruvians, before the Spanish conquests, to those of oriental nations of the most remote antiquity, has been frequently referred to by historians best acquainted with the peculiarities of each.

The revolutions of the civilized nations of ancient Asia are repeatedly referred to in biblical history to instruct the people in the causes which led to proposed reformations in their moral laws.

To obtain relief from oppressive superstitions, famine, diseases, and wars, or to find means fully to express the wonderful movements of mental action, ancient revolutions may have driven numerous colonies, in long forgotten ages, to seek refuge in most distant lands as now.

That such emigrations were made by land occasionally, a curious proof exists in the interior of China. A town is inhabited by descendants of people from the neighborhood of the Mediterranean, bearing manuscripts of Hebrew laws, written upon rolls of skins or parchment, in the peculiar characters of that people, and still remain as evidence of their original descent, although the present inhabitants have become so assimilated with the Chinese, that no one among them can read or comprehend the language of those ancient commandments.

If the modern knowledge of the winds and currents of the ocean permit, the writer will attempt to show, that sea-going vessels, well managed by Phœnicians, Tyrians, or Carthaginians, equal, at least, to those in

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which Columbus made his discoveries, were perfectly competent to traverse the Indian and South Pacific oceans, and to have landed a civilized pair on the coast of Peru, sufficiently near Lake Titicaca to give permanent credit to their appearance from that direction, to instruct the gentle and tractable aborigines of those mountains, who, by the mild, intelligent, and persuasive character of the strangers, adapting their moderate government to the peculiarities in the dispositions of the natives, gradually acquired that prominence in the peaceful arts of life which put to shame the acts of later conquerors.

In comparing the skulls of the Incas family with those of the aboriginal Peruvians, engravings demonstrate the latter were deficient in intellectual character, while the Incas exhibit very distinct differences of conformation and of ability.

The oriental practice of travelling, by water or land, accompanied by wives, is notorious. It still appears a trait of character distinguishing eastern people, both in Asia and America.

Captain Gallownin, of the Russian sloop-of-war Diana, sent by his government in 1811 to make a survey of the Kurile group, and to attempt friendly relations with the Japanese, was induced to land with a weak party, and taken prisoners. The officers of the Diana, in retaliation, intercepted a Japanese vessel of the largest size. Fortunately, the captain of this vessel was a great ship-owner and merchant—a person of much influence and ability. He and his lady, the inseparable companion of his voyages, are described to have borne their misfortunes with wonderful composure, like old sailors.

We are taught by the winds and currents of the north Atlantic ocean, that had Christopher Columbus sailed on his voyage of discovery in a different month of the year, he never could have reached the New World. He would have perished amidst calms, of which he knew nothing.

The temperature of the blood of a young bull in Cuzco was 100° Farenheit; air 57°. At the base of the Andes 101°; air 78°.

We were invited to join a party of gentlemen on horseback to meet the prefect and his family from Arequipa. At the hacienda *Angostura*, a large dinner table was spread on the piazza near a fresh stream of water, shaded by willow trees, the air fragrant with the perfumes of flowers and orange blossoms. The farm yards were filled with cattle and sheep, while the fields around were planted with maize, barley, potatoes, or green with lucerne. In the garden, peach, apple, and pear trees were seen. We dismounted in the court-yard. A mule came into the gate with a square box on his back, covered like a market

wagon, with a raised cotton-cloth cover upon hoops. Inside were three noisy, laughing children. From the number of persons ready to assist the youngsters, there was no mistaking these little Arequipanians, who were delighted to get out of their box. The Señora and Señorita were in their riding dresses. The ease of manner and beauty of the Arequipa ladies have been celebrated; the daughter was about eighteen. She received the compliments of a hundred beaux with graceful modesty. The dinner table was well supplied with meats and wines, and a desert table with many good things. Champaigne wine and sweetmeats seemed of more assistance in speech-making and toasting than keeping the party together on the road back. A judge of the court assured the party "he should give up drinking *water* as soon as the navigation of the Madre-de-Dios was open."

Angostura belongs to the Bishop of Cuzco; it is one of the best cultivated haciendas in the valley.

A number of Indians collected in the small town of San Sebastian were celebrating the Saint's day of the little church. The main street was decorated with flags; arches were made with poles on each side, and strings stretched across, to which were suspended *coins* of silver. The first we passed under was adorned with one dollar pieces; the next, half dollars; then quarters, shillings, and sixpences. Other arches were made to which were hung pottery, fancifully-painted pitchers, jugs, pots, and jars—all of earthenware. These hung so close to our heads that some one plucked a specimen, which disrespectful act brought down a string, and almost all were broken under our horses' feet.

The Indians were dancing in the little plaza, some in *black* masks, others with cows' horns and the skin of the cow's head over their heads and shoulders. A crowd of them were teasing a young bull, pulling his tail and mounting him. The poor animal was tired down and secured, specially disgusted at the music of a cane flute and hide drum.

We halted in the plaza and witnessed a sham fight with bows and arrows, war clubs, and large wooden swords, gotten up for the moment for the benefit of the prefect and his family. It was the representation of a fight between the Quichua Indians of the Andes, and the Chunchos of the lowlands. The killed, wounded, and prisoners in Chunchos shoes was dreadful; while the delighted Quichuas went through the motions of cutting their enemies up, one by one, into small bits, and heaped them on one side like sticks in a wood pile.

The church doors were all open; the altar brilliantly lighted with tallow candles; and along the walls on the outside stood rows of immense chicha jars, carefully guarded by the women who huckstered it

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out—a sixpence for an earthen jugful. The whole affair was a curious mixture, difficult to digest by those unaccustomed to such habits. Many of the ancient Indian customs seem to be allowed; this has a good effect upon the aborigines, who give preference to cows' horns and chicha over the more expensive requirements of the church.

From the balconies in the streets of Cuzco flowers were showered upon the heads of the ladies, and the people shouted "Huzza for the new Cuzcanians!" Many families were ready to welcome the lady and her children into the prefectura, and after night she was serenaded by a brass band. We have never seen the moon rise with such splendor as it does over the snow-capped mountains to the east of Cuzco; she throws her light quietly down over this interesting valley. There are two noises which disturb its midnight stillness—the braying of a jackass and the baying of a dog; both seem to wake up as the moon peeps through the silvery peaks. The cocks crow as the moon is eclipsed by a passing cloud.

The house of a prefect is generally a gay one. The gentlemen meet in the evening to talk over the news of the day, play cards, and so on. There is very little visiting among the ladies of Cuzco except on Sunday after church. They are seldom seen walking in the streets. On Saturday evenings they repair to the plaza to purchase a new pair of shoes, which is the time to see them at most advantage. On these occasions the priests appear with little silver images, standing on one side of a large silver plate; as the ladies pay the Indians for their shoes, the padre presents the image to be kissed, and the plate receives a donation or church-tax upon the price of shoe-leather. There are very few who kiss the image that do not pay, unless it be the *second* time the priest has offered it on the same Saturday, and then they bashfully decline. On these days poor families send old books, bits of iron, horse-shoes, nails, spikes, bridle-bits, and stirrups, or any other article they may want the money for, and the Indian servant sells them for what she can get. There is little wealth in Cuzco; with a few exceptions, the people are as poor as they are indolent. Some of the more energetic, who own haciendas in the valley, and have mercantile houses in the city, are called rich—that is to say, they have more than they require to live upon.

The climate of Cuzco, during our stay, was not pleasant; cold rains water the hill-tops, which, in the morning, are white with frost, and being evaporated, form clouds. Though Cuzco is within the tropics, and the dry or warm season extends from May to September, the people are dressed in winter clothing. When the sun passes Cuzco, on his way south, the rainy season commences; the drops come down in hail and

snow flakes, and under the vertical sun the people are in mid-winter storms, and require more clothing in what, astronomically speaking, is their summer, than they do in their winter months. Strangers suffer somewhat at first by not watching closely the changes of the temperature, and dressing accordingly. Influenza and rheumatic affections are very common; many of the poorer classes have small-pox for the want of vaccination. There is a good deal of dropsy, but few cases of consumption.

The Indians use more coca here than elsewhere, and seem to injure their health by chewing such quantities. Those living in the city are thin and miserable-looking, in comparison with the country people. The Indians seem to be much neglected; when they are sick, they wait patiently until they die or get better. The charges of medical men are high; Indians cannot afford to employ a Doctor. The native physicians are generally the most moderate, and understand the climate the best. There are a few foreigners in Cuzco, among them a French baker. The people seem as fond of talking with him as they are of eating his bread.

The city abounds with shop-keepers and tailors, who pass their days in the sun. As the twilight commences, the street doors are closed, and the town presents a dark and doleful appearance. Here and there a lamp is hung out in front of eating, government, and gambling houses. The young men play billiards at a sort of club, where the room is decorated with a likeness of Napolean Bonaparte on one side, and George Washington on the other. A Frenchman keeps the house.

The French are much the most popular foreigners. They soon marry a country woman, and adopt the manners and customs of the Spaniards. An Englishman don't manage so well; one may mistake a Frenchman, who has been in the country a long time, for a Spaniard; but the florid English face declares his nation at first sight. John Bull seems delighted with an opportunity to speak English, while the French tongue seems slung for Spanish. The Frenchman practises the courtesies and habits of these people; introduces his wife and all the children to you. He seems settled for life; the other talks constantly of returning to old England. He is more active, sometimes cultivates the soil, or is engaged in mining. Since my return from the Madre-de-Dios, a young Englishman gathering bark, with a party of Quichua Indians, in a south-easterly direction from San Miguel farm, were all murdered by the Chunchos.

The mail arrives and leaves Cuzco for Lima, and other places, twice a week. There are two mail routes to and from Lima; one inland through

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Ayacucho and Huancavelica, distant 189 leagues; the other by the English steamer from Callao to Yslay, thence through Arequipa. This is the most expeditious route; the distance from Cuzco to Arequipa is 95 leagues.

October 28, 1851.—Our baggage well covered with tarpaulins. José's saddle wallets received two roasted chickens, a leg of mutton, and a large cheese fresh from the dairy, a present from the kind lady of the house. This is the custom of the country. José tells me, as we follow our train out of Cuzco, when guests are treated in this way, they may be sure they are considered friends of the family. The hospitality of this country is conspicuous and delicate.

The arrieros contract to go from post-house to post-house, on the road south. I was recommended to go by the post, instead of engaging mules for so long a distance. Although the change of mules is desirable, the daily change of arrieros is not; the men work best after they become accustomed to us.

The Indians are ploughing in barley and hoeing corn. The crops suffer for want of rain in the valley. The road is very dusty. We halted for the night in the small town of Oropesa, and for the first time took up quarters in a Peruvian post-house. The moment Paititi entered the patio, he began to war with the dogs. The house consisted of one story and one room. Travellers take a house; we had a table and three chairs, made of the wood of the montaña; in the corners were *earthen* couches for beds. The walls were dirty, painted with pictures of angels and saints. The ground floor was swept for us. As we took our tea, Paititi sat in the doorway looking on. I felt a flea. The entrance to the corral where the post-mules were kept, was opposite the kitchen, where two large black hogs were feeding. In the doorway was seated the fat, homely wife of the postman. The smoke of the kitchen fire gracefully flowed out over her shaggy head; she was a very cross-looking woman. One of her hogs came near, and Paititi gave him a snap in the ham; she mumbled out something revengeful, while the jolly postman laughed and praised our spirited watch-dog.

In the morning at 7, thermometer 58°, the postman came to say good morning, and inquire how we passed the night, as though he did not know how full of fleas his house was. After breakfast he left his sour-looking wife, and accompanied us to the next post. The custom is to pay fare in advance. Paititi gave the fat woman's sow a farewell nip, and we marched on.

As we rise the side of the small mountain of rocks and red clay, we look down upon a lake of clear water, in which a flock of wild ducks

are bathing. Beyond its green shores, we see lucerne, cornfields, and haciendas surrounded with willow trees, near the base of barren hills. This is the eastern end of the valley of Cuzco, which is about five leagues long, and two miles wide in some places. It is thickly inhabited and well cultivated. Our course lay along the western bank of the Urubamba river, a tributary of the Santa Ana. The waters glide swiftly on northward. The river is straight, thirty yards wide, with little fall; rocky bottom, and muddy water. The stream passes between two ranges of hills. In places the valley is half a mile wide; then again there is just room enough for the river and our road. Here the shores are of black rock, then of gravel, then clay breaking down perpendicularly, or with a long sandy beach. While the wild ducks feed upon the water, the snipe seeks his food along the shore. Small fish and tadpoles are plenty; but we saw no large fish in or out of the water.

The town of Quiquijana has a population of two thousand Indians. They cultivate the soil as high up the mountain-sides as the producing line; raise sheep and cattle. Mules are very fine-looking here. Where the lucerne is not in blossom, we feed our mules with corn-fodder, and they travel the better for it. Unripe lucerne weakens the animals. There is an elevation above the sea at which barley grows, but never produces grain. The stalk is very much liked by the mules, either green or dry. On the flats it is raised and stored away for the dry summer season, when the parching sun destroys the pastures.

We crossed the river on a freestone bridge. There was no toll to pay. The road keeps the east bank of the river. The clouds stand still over head, while we have a draft of wind through the valley, and every few moments a wind comes in at right angles through the deep cuts in the ridges. The mountains on both sides of the river are as regular in shape and size as though they had been planted by hand. The small, coarse grass parches yellowish.

Leaving the small Indian town of Checcacappa, the river runs from the east through the mountains. At the turn there is a brushwood suspension bridge in such a ruinous condition that we waded the stream above, and continued our course south, through the valley, by a branch of the Urubamba, called by the arrieros Sicuani. Beans and jackasses seem to be the principal productions. After travelling some time between high ridges of mountains, to come suddenly out upon level land and small hills, reminds one of the break of day. Changed baggage-mules at Cacha, a small town, where at midday the thermometer stood at 71°.

October 31.—Found boiled eggs plenty, and a pleasant postwoman.

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The town of Sicuani is larger than any passed through this side of Cuzco, and built differently. On the long main street, which is crossed by small, narrow lanes, we saw many pretty faces. The women are in the majority in the market, buying and selling marketing—potatoes, peppers, &c. For a country town, some of the houses are very respectable-looking. The creoles regard us with an air of surprise. As we walk along, they look very grave, touch their hats, and bow politely; but suddenly turning, one catches them laughing and making remarks. At first they called us Frenchmen. We tell them their mistake. They inquire, "Englishmen?" Upon being told North Americans, they exclaim, with a wondering expression, "Oh! California!" A party of Indian boys were playing with tops—one of the very few things reminding us of home.

A printed notice, pasted at the corner of the plaza, forbids the trapping or shooting vacuña, by order of the supreme government. When the people gather the wool of the vacuña, they *kill* the animal, instead of shearing it and setting it at liberty again. We were told it was easier to take the fleece off when the animal was dead. As their numbers are decreasing, the government protects them.

November 1.—At 8 o'clock a. m., thermometer, 54°. It rained during the night. The hills are now covered with snow. After leaving the town and wading the river, we followed up the western bank of the stream. On arriving at a small town, our baggage-mules passed ahead. Proceeding some distance, we met a man, who told me the baggage was not on that road, and we turned. After travelling for some time, I suddenly missed Paititi. We had turned back without calling him. Paititi had become a pet, and was now considered as one of the party. José went back in search of him; but we never saw our brave little animal again. He had guarded our tent by night, and fought our battles on the road. He made friends for us, too; for whenever the people heard his name, they wanted to know his history. The mountain people take great interest in such matters; and when they learned where Paititi came from, they became interested in the party, and were the more polite upon introduction through the dog. We have lost a friend.

Agua Caliente post-house is the most miserable habitation imaginable, surrounded by a few ruins of small houses. The evening is cold; the tops of the mountains covered with snow. The post-mules pastured on coarse grass in the plain or mountain pass. Our mules are unsaddled and set at liberty to go with them; but they return to the door, and look for their usual supper. The postman, a poor old Indian, was with

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By Lieut. L. Gibbon U. S. N

Lith. of P.S. Duval & Co. Phila.

AGUA CALIENTE POSTA. (Peruvian Tavern.)

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difficulty persuaded to sell us some barley straw, which José found in one corner of a ruin. Dark cumulus clouds being about us, as the rain, hail, and snow came down from southeast, the mules stood shivering at the door. The scene is wild outside, and miserably dirty and damp within. Five slim, hungry post-dogs came impudently into our house at supper time. One of them went so far as to put his nose into José's saddle-wallets. He at once engaged an Indian to go back to the small town, and look for Paititi during the night.

A short distance from the house a mist was observed rising from a spring amidst the hail-stones. The air was 40°, and spring water 122°. This hot water bubbles up from the earth like boiling water in a pot, and is the head of the river we have been travelling along. The hot water flows northward. This spring appears like a small steam-engine, working with all its might, manufacturing water for one of the branches of the mighty Amazon. The water on the other side of the house flows southward, declining to become Amazonian.

The Cordillera and Ande ranges here cross or come together. The Andes range to the north of this high place is generally lower than the Cordilleras. From here south the order of things is changed. The eastern ridge in Bolivia and Chili is more characteristic of the western chain of Peru and Ecuador. To the south we are told the western range is lower than the eastern.

Our compass dances about so much that it is of no use here; at one time it stands still with the south point down, and then again flies round as though it had lost the north point. The soil is very wet and swampy. The small snow-water lakes are filled with wild ducks, geese, and black divers. We shot a pair of white geese, with tail and ends of wings black, small bills and large heads; the male and female both of the same color.

The town of Santa Rosa has a population of five hundred Indians; it is difficult to tell whence they draw provisions, for not an inch of this part of the country is cultivated, nor do we observe anything particularly agreeable in the climate.

Our hour for starting in the morning is six o'clock; but here the postman and arriero went to prayers; so we waited till 9, when we entered a puna, level as a floor. The mountains dwindled away to hills; sheep are grazing on the plains; as we breakfasted on our roasted goose by the side of the path, a tired Indian came up and told José he was very hungry; with a wing and a biscuit, he followed his drove of eighty llamas more comfortably. I once asked an Indian what he did when he was out of provision? He replied patiently, "Don't eat."

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Here and there a low ridge crosses the plain east and west; as we rise one of them our view is uninterrupted, except in the distance on the east and west sides, when low ranges of small hills stretch along north and south. At a small stream flowing west we shot a wild duck, and got a crack at a snipe. As the thunder clapped to the northeast, we rode into the town of Ayavire, a puna town. The Indians all look neatly dressed in coarse blue cloth; the houses are clean, but small, with narrow streets. Two tall church steeples run up in the midst of the houses, and a small plaza in front. What we first noticed was the silence; not even the noise of the hoof of a jackass was heard on the paved streets.

We dismounted in the patio of the cura of the town, and met at the door three young ladies. I gave an open letter to the eldest to read; the cura was not at home; the letter was from his son and their brother in Cuzco, and we were welcomed. They had just finished dinner, but we were served. A servant took the letter to the cura, who was dining out. A message came from the governor to invite us to join his party; we brushed the dust off, and the ladies arranged their hair, when we walked with them through the town. At the governor's house we met the old cura, who introduced us to the dinner party. It was *after dinner* with all; we found them very agreeable. The cura insisted upon our drinking a glass of wine with every lady in the room, which was tough work, as there were quite a number. Music and coffee were introduced in a room on another side of the patio. The cura was a sharp-featured man, tall and very slim, with a most agreeable expression of face. He smoked a paper cigar on an average of every ten minutes during the evening. He was particularly fond of dancing with a pretty young girl of sixteen, though he was about sixty years of age. He kept remarkably good time; was full of life and gayety while with her; but when she was otherwise engaged, he amused the party by falling to sleep in his seat. He received the laughter and remarks of the elder ladies with good humor; lighting his cigar by the candle and looking round the room at the same time, burnt his fingers, which discomposed the musicians, and confused the cotillon. He had drawn hollows in his cheeks by working so much at the tobacco leaf, and forfeited every tooth in his head, which was bald. Yet, his pleasant smile and agreeable manners overcame these particulars, for the girls certainly liked him. His three daughters were handsome persons, and had much of the old cura's gayety about them. One was married to a miner, who she says is doing little.

There are a few silver mines to the northeast of the town, which have been abandoned, except one or two, from which little silver is extracted. In the morning, we visited the church and saw the cura in his clerical robes. To meet him came numbers of Indians, well dressed in blue—their favorite color. Their hats, made of puna grass, and covered with blue cloth, are lined with scarlet. The population here go barefooted. The little town is thickly peopled—about fifteen hundred—but the plain is not, and resembles a desert in many places. Near Ayavire barley grows, but no grain is produced upon it. Potatoes and a little wheat are brought to the plaza, a short distance from the east, and from the valleys among the hills to the west. Corn cannot be raised on these flats. Sheep are the principal animals here; black cattle and horses are very small. The only spontaneous growth is a short, coarse puna grass, which is not in the least green.

November 4, 1851.—At 3 p. m., thermometer, 57°; wet bulb, 52°. About the hill tops there is rain, thunder, and lightning; the rain turns into sleet, and the hills are white, while clouds appear after the rising of the sun. On the puna, the reaper cuts his crop and leaves it on the ground during the dry season; when the rainy season commences, he plants again.

A strange traveller halted in front of the cura's door, where he and I were standing. The compliments of the day were exchanged, when a long pause followed. Upon invitation, the man dismounted, and his horse was taken away by an Indian. Dinner was ordered by the daughter; the man ate, smoked, slept, and was off next morning by daylight. The cura said "that is the way we travel in this country; many a time I have begged a dinner and night's lodging on the road. I never saw that man before; he is from Arequipa and going to Cuzco."

One of the cura's daughters had a headache after the dance; she was cured by one of our Siedlitz powders.

We journeyed along the lazy stream that winds its way towards the south. Young lambs are staggering after the ewes. Indians of the puna wear thick woollen skull caps. The sheep are sheared at the commencement of the rainy season, when potatoes are planted. December is the first stormy month; now the sky is of the clearest and of the deepest blue; the days are warm, and the nights cold. We dismounted to drink from a small stream, and shot a pair of ducks. As we mounted, José's mule became frightened, kicked at a most furious rate, broke from him and ran across the plain, through the flocks and sheppardesses; stripped itself of saddle bags, gun, and part of the bridle, but turning into the road, joined the baggage mules. Two days ago, José was thrown in the most ridiculous manner over his mule's head.

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When a mule becomes frightened, it is almost impossible for a man to hold on; its whole strength is brought in opposition to the rider; and notwithstanding the powerful bit used in this country, it often succeeds in getting away. José generally finds something to amuse during the day, his grave countenance making the scene the more laughable.

The master of the post at the small town of Pucará was a judge. Before our leaving in the morning a case came before him. Two Indians quarrelled about some property, while celebrating the saint's day of the church. They both drank too much chicha; then the quarrel took a more serious turn, and they were arrested. Witnesses on both sides entered the post-house; the men stood up along the walls; one by one told what he knew about the matter. The women were then called upon. The two parties seated themselves opposite each other, near the door. The judge questioned one; her answer brought on a general discussion. They became very violent against each other. The scene became interesting. When the Indian women have trouble, they cry and talk at such a rapid rate, without listening to what is said, that the judge declared he never could make head or tail of their evidence. The case was postponed.

There is no dew at night on the puna. Half way between Pacará and Lampa, the river Ayavire turns east; it is a small stream, about fifteen yards wide. The wind here was up the river, and on the hill side, and in the ravines near by, there were a few stunted trees. The small river basin stretched off to the east; the winds come down over the water and strike the hill there, and nowhere else do we observe such a growth as on the hills near these puna table-lands.

The town of Lampa has a population of about four thousand. The Indians are very black; the hot sun burns them in the day, and in the cold nights they are smoked in their houses, some of which have tile roofs, but they are generally thatched with puna grass. Neither the heat of the sun, nor the effect of the smoke, has as yet made their hair curly or woolly. It is worn in one long wig, China fashion. Many of them were hewing stone, and preparing to increase the size of the church, which appears to us very large, even now.

The sub-prefect was suffering from neuralgia, and many of the creoles had toothache and colds. Lampa is a sort of half-way house between Arequipa and Cuzco. The trains of mules, loaded with foreign manufactures, halt here to rest on their way from the coast.

Our mules were well shod all round for the first time since we purchased them in Lima. I made an agreement with the blacksmith that they should not be whipped, in case they refused to stand still. We

expected a kicking from Rose, but she stood quietly. The blacksmith wanted to buy her, and said she was worth more than she cost in Lima, though mules are more plenty here. He charged four dollars for eight shoes. The man's son held the mule; his daughter handed him the nails, and his wife cooked her chupe by the smithy fire. She makes pottery and he silver spoons; he is a creole and she an Indian woman. One spoon had a sharp-pointed handle. After breakfast, which came in between the shoeing of Rose's fore and hind feet, the woman picked her teeth with the sharp end of the spoon; after which she used it as a pin to hold on her shawl or manto, made usually of scarlet, blue, or yellow coarse cloth, cut square, and sometimes ornamented with white silk or silver thread. When cold, it is raised over the head, but generally covers only the shoulders. The blacksmith was very polite, and seemed actively employed. His shop and house are in one, situated near where the arrieros stop, so that he is constantly called upon for shoes. He wanted to know if we were not Germans!

The silver mines of Palca, seven leagues to the westward of this place, are profitably worked. There are no steam engines. Some of the old mines contain water, but are said to be valuable.

From Lampa to Crucero, the capital of the province of Carabaya, the distance is thirty-one leagues in a northeasterly direction. From Crucero there is a path through a rugged country, crossing mountain streams, to the gold mines of Carabaya, situated in the wild woods on the northeast side of the mountains, among which the tributaries of the Madre-de-Dios take their rise. Gold was discovered and mines worked in Carabaya many years ago; of late, new discoveries have been made, and more gold hunters seek their fortunes there. At the commencement of the dry season three hundred Quichua Indians set out on foot, with provisions and clothing upon their backs, from Crucero to the mines. The road near the mines is too rough for a mule. These Indians are employed to work the mines by creole companies.

The gold occurs in quartz and in veins of black dust, which is sometimes half gold, and also in grains among the sands of the river. I was told one of the lavaderos or washings, called "Alta Gracia," worked from May to December last year, by 150 men, produced one hundred and twenty-five pounds of gold.

Pavements are built in the beds of the streams five yards square, which are overflowed in the rainy season, and the gold deposited to the amount sometimes of five ounces, which is separated from the sand by washing in the dry season. The men suffer somewhat from sickness and exposure; provisions are very scarce, for every man has to carry

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enough to last during the season, as the country is uninhabited and uncultivated. Specimens we saw were in lumps of from one to two ounces each, and closely resembled the gold of California. I am told that persons have lost money by placing too much confidence in the exaggerated reports of the riches of these Carabaya mines. The expense is very great. The daily wages of laboring Indians is fifty cents per day, besides provisions. They received twenty five cents per day for building the church in this town, where they enjoy health with their families, and live an easy life. At the mines the climate is hot.

Those who remain late in the season are in danger of being caught on the east side of streams which are impassable when flooded. From December to May during the year the mines are unemployed; they are beginning to come out now. Peruvian bark is found in Carabaya.

November 6.—At 6.30 p. m., thermometer, 52°; wet bulb, 45°. A small stream flows southeast by the town, over which is a well-built stone bridge. We keep along the east bank. On the plain to the south we thought we saw a sheet of water, but it was the refraction, which seemed to raise the hills up; they looked like islands. The country is becoming more cultivated as we proceed south, and cattle are more numerous. We find nearly the same dry, burnt-up vegetation and dusty roads, though the air feels moist enough for green fields of grass.

Halting at the small adobe-built town of Juliaca, with a large church as usual, our baggage-mules were changed. We spent the night at Caracota, and changed mules again at Pancarcolla. To the left of us we beheld the deep blue waters of the great southern lake Titicaca. The east wind troubled its waters; the white-capped waves reminded us of the trade-wind region of the ocean. Large barren islands intercepted our view; not a tree nor a bush was to be seen; the only living thing in sight was a llama, seeking food among the tumbled-up rocks on the unproductive hills. The scene is wild and deadly silent. Our only view was to the southeast, where we saw tops of islands beyond tops of islands, backed by mountain peaks.

The wind is cold, and the parching rays of the sun scorch the very skin off. Our green veils are so constantly blown off our straw hats that we pocket the troublesome things. The Indians on the road are very polite. We are told that it is a custom among them to salute those coming *from* Cuzco first, thereby showing respect for their ancient capital.

There are great differences in the faces of the Indians, particularly among the women. Some of them resemble negroes, with thick lips, flat noses, and a stupid expression of the eyes. Others look bright, intelligent, and lively. From the cheek-bone the face narrows uniformly to the chin. The nose is small, straight, and sharp-pointed; the lips thin. Should any have Manco Capac's blood, I doubt if they know it. Some of them are very Shanghai in appearance, while others are taller. They generally walk together, with the old women behind. The men keep to themselves, and are remarkable for their family likeness. All seem serious, well behaved, and are always deeply interested in whatever they may be employed, let the occupation be ever so trifling. They never seem to be in a hurry. They commence their work before sunrise, and get through with it by sundown, provided there is no chicha interference, which sometimes delays them on the road till after dark. In such cases, the chances are, there have been some unpleasant feelings *washed* away.

I saw two Indians meet who had a difficulty. One was very much affronted, while the other, aware of having done a wrong, wanted to make amends. He bought a cup of chicha, and begged the other to drink it. For some time he refused, until the wife of the other persuaded him. The moment it was taken, their faces changed to smiles, and the trouble was forgotten. When there is ill-will among them, they are so quiet, and their hatred so deep rooted, that it is only by witnessing a settlement that one is convinced of their strong feelings. They are truthful, honest, and respectful, one towards the other; they have no affectation. Disinterested kindness and politeness are found among them in purity. We often amuse ourselves watching the love-making scenes, as those of marriageable age travel along the road. Exceeding modesty on meeting others invariably accompanies both the man and the girl. The men laugh at and joke the man, while the old women scold the girl, and seem everlastingly opposed to matches.

Winding round a hill, and descending a ravine, we come to an arched gateway, and enter the city of Puno. It is a dry, dusty, uninteresting-looking place, of about five thousand inhabitants, and is the capital of the department of the same name, containing a population of 245,681. The town is situated about a quarter of a mile from the west shore of Lake Titicaca. The ground towards the lake is a flat, green swamp, with a long stone wharf jutting out into the water, at the end of which are a few washerwomen, and some balzas laying at anchor. As we entered the plaza, the captain of the police inquired whence we came, and politely directed our way to the prefectura.

There were many officers in uniform, and soldiers lounging about town. There was a warlike appearance here. Two extra battalions of troops had been lately sent from Lampa, complaints being made by the

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merchants of quantities of "bad money" coined and introduced into this country from Bolivia.

The prefect was a colonel in the army. At his dinner-table, the subject of *war* predominated. On the table were two kinds of wine—one Peruvian, the other foreign; those who preferred the former were praised for their patriotism, and received an extra invitation from the prefect to take another glass. The table was well supplied with beef, mutton, and potatoes. Yuca was considered a great delicacy; wheat bread was scarce. We saw here what we had before seen at a midshipman's mess—one man cunningly eating another man's allowance. Salad heads are of good size.

November 10, 1851.—At 12.30 p. m., thermometer, 54°. The wind blows from the eastward daily, all the year round; commences as the sun rises; at sundown it falls calm. Light westerly winds sometimes blow during the night. In such cases, the stars and moon shine clearly; otherwise, the nights are overcast, and always cold. The mornings are like our springs; the midday sun warm. There is neither dew nor frosts, though the wind sweeps over the surface of the lake. Ice is formed about the spring-water streams on the sides of the hills.

From an island in sight of Puno, the Indians bring vegetables to market. Small fish are sometimes taken. Round black pebbles are gathered from the bottom, and, with sheep's knuckle-bones, sold to pave the patios of houses in the town. The Indians navigate the lake in balsas or boats, made of the lake rush, which forms the material for both hull and sails. They can only sail with a fair wind. It is always fair to market in the daytime, and sometimes favorable at night to return home. Headway is made against adverse winds by polling over shoals.

The color of the water near the shore and shallows is green, like sea water. When deep, it is blue. The surface of the lake in front of Puno is nearly covered with dead rush stalks. Among them a few wild ducks are feeding. The stench arising is disagreeable. The water is not used for drinking in the town, though Lake Titicaca is not a salt lake, as at one time was supposed.

The rainy season commences about the middle of December, and ends in the middle of April, when probably the depth of the lake may be increased *one* foot. Such is the opinion of intelligent persons in Puno, though no one is known to have measured the difference of height between the wet and dry seasons.

On the lake there is one small schooner, belonging to Bolivia. The captain told me he never found more than thirty fathoms water; gen-

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By Lieut. J. Gibbon U.S.N.

Lith. of P.S. Duval & Co. Phila.

TITICACA BALSA, off Puno.

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erally much less. In some places the water is so shoal that there is just room to push a balsa through the rushes. The deepest water is found on the eastern or Bolivian side.

This lake is about forty miles wide, and eighty miles long. By the appearance of the flat land we found on the north side of it, we judge it was at one time very much longer and deeper.

In the rainy season the rivers are loaded with soil from the mountains around, which being emptied into the lake, settles, and the water flows off, leaving behind its load of earth; and so the work from time immemorial has been going on. This great lake is gradually filling up; the water is getting shoaler every year; finally there will be a single stream flowing through what, in future ages, may be called Titicaca valley.

The easterly storms beat against the eastern sides of mountains scorched into dust by the rays of the sun in the dry season. There is no sod or growth to protect the soil from the heavy rains, which wash it away much more than on the western side.

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CHAPTER IV.

Manto silver mine—Trade—Shores of Lake Titicaca—Rush balsas—Animals—Loftiest mountains—Aymara Indians—Mode of cultivation—Bottled fish—Frontier of Peru—Rio Desaguedero—Rush bridge—Bolivian military and custom-house—Southeast trade winds—Tiahuanaco ruins—Evaporation and precipitation—Planting small potatoes—Difficulty among postillions—City of La Paz—Population—Cinchona bark—Beni river and Madeira Plata—Transit duty—Gold washings of Tipuani—Productions of Yungas—Dried mutton and copper mines—Articles of the last constitution—A Bolivian lady's opinion of North Americans—Illimani snow-peak—Church performances of the Aymaras—Benenguela silver mines—Growth of cedar bushes.

The silver mines near Puna, with the exception of one, are standing idle. Manto, the principal mine, is situated two miles south of the town. It has been worked for twenty years; the vein ran nearly horizontally west-southwest, rising a little as it passed through the mountain. Water flowed out after the miner had gone in some distance, and a dam was built at the mouth of the mine, which backed it up. Iron canal boats navigated the stream, and brought out cargoes of rich silver ore; as the miner travelled on, he found the more use for his boat. The canal was locked, and the water dammed up by the gates; some distance farther back, when a second and third gate were built, the stream became smaller, and the vein rose much above the level of the entrance to the head of navigation. Pushing on into the bowels of the Andes, the miner built a railroad of iron from the canal to the head of the mine, continuing to lengthen it after him. When the train came down loaded with metal, it was embarked and floated out by boats with lights burning at the bow and stern, as the canal is winding and narrow, with just room for the boat to pass between the rocks.

A steam-engine turns a large stone wheel of twelve feet diameter, under which the ore was ground. It was washed by water from the canal, and separated from its quicksilver by the heat of fires made from the excrements of llamas, the only fuel known here. Meteorological observations at each lock in Manto canal, show at No. 1—air, 70°; water, 60°. No. 2—air, 68°; water, 60°. No. 3—air, 64°; water, 59°. The distance to the head of navigation is about half a mile, though the workmen say more than a mile. An Englishman has been engaged here of late years, and after spending much time with little

gain, has left. Manto, with all its machinery, stands a ruin. The mine is falling in; the canal-boats leak; the engine is rusting, and the last boat-load of silver ore was scattered over the ground. I am told that the vein has been gradually decreasing in richness as the expensive works have been going on. The machinery was brought from England, and transported over the mountains from the coast on mules' backs, at great expense.

The necessity of bringing proper workmen with the machinery is also costly. Provision is scarce in Puno, and people from other parts of the country complain of the market. Thick clothing is required in this climate, and tailoring appears to be the best business. Englishmen are generous in their expenditures on machinery and preparations for mining. There certainly has been a great deal of labor expended at the Manto mine. There are a number of other mines in this department, and some in this neighborhood; but, with the exception of the gold mines of Carabaya, there is very little profit gained under the present system of management.

The annual yield of silver in the departments of Huancavelica, Ayacucho, Cuzco, and Puno, has been decreasing for some time. The custom has been to abandon the mine as soon as the chisel struck below the water-line, and seek for a new vein; until now, when we want silver more than ever, it is all under water. There are few new discoveries made, and mining seems to have become, year after year, a less profitable business. Merchants are afraid to advance large sums of money, lest it may be lost by the vein running out, leaving expensive machinery on their hands. Yet there is undoubtedly immense riches in the different metals of these departments, which might be extracted after a scientific exploration of the country, and with a judicious system of mining.

From what we see, there is no reason to expect so large an amount of silver to flow from South Peru as heretofore. The creole portion of the population shrink from all kinds of labor; they sit at the mouth of the mines to receive the silver, and live a life of ease upon it. To the poor Indian mining is an harassing labor. He seldom reveals to the creole any new discovery; he never seeks work at the mine, but turns to the cultivation of the soil in the congenial climate of the valleys; tends his flocks on the mountain-side, where he is better fed and clothed, and where his wild and honest feelings are gratified. The wool of sheep and silver are the chief exports from these departments. Besides Peruvian bark, copper, alpaca wool, vicuña skins, matico, gold, hides, and chinchilla skins, there were exported last year over five hundred thousand quintals of nitrate of soda from the seaport of Arica.

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The mail from Puno to Callao goes by the English steamer from Yslay in eight days, leaving Puno every two weeks. The creole portion of the population is not very great, except in the army. There is a college of science and art here, like that of Cuzco. We found the boys practising the broad-sword exercise with single sticks.

In the larger towns the *government* has established public schools. In this department there are sixty-three for boys and three for girls. In these schools Indian children are admitted and taught as well as the creoles. There are few African slaves in South Peru.

The country is over populated; I mean for the productive portions of the land. There are many square miles in these departments barren and unproductive, unpopulated, and utterly worthless, so far as cultivation goes, though they may contain great mineral wealth. The inhabitants are confined to the valleys among the mountains, which are generally narrow, and crops are principally raised by irrigation. The Puna country is higher, and better adapted to wool growing, but very thinly peopled. There are many places so high above the level of the sea that people cannot live there with any sort of comfort, nor can they gather from the earth a living. The ant will die an unnatural death, placed where the llama naturally lives and flourishes. The llama, again, will perish with heat where the ant builds its nest. In the deep valleys are the most children, the greatest amount of vegetable life, and more of the animals known in different parts of the world, such as the horse, horned cattle, domestic cats, dogs, bees, and humming birds.

People have said that the population of these departments do not increase in proportion to the increase in northern portions of the world, and ask, why it is. People upon the Andes do not multiply if they do not seek the rich lands.

As we ride along the shores of Lake Titicaca, the Indians are seen sucking the juice from the lake rush; they also make salad of it. The cattle and horses wade up to their backs in mud and water after it. The sheep who seem, here in their native soil, glad to get a bite of something green, run down from the parched hills, and feed along shore. The hog, too, comes in for his share. The whole animal kingdom run to the lake for a living. It is a written invitation to navigation and cultivation. The mountainous parts of Peru are very dry.

November 15, 1853.—At 1 p. m., half the heavens are covered with cumulus clouds. Air, 56°; lake water, 64°. Thunder to the northward, and rain falling there; the east wind blows fresh. The beach is of gray sand, and in places muddy swamp. The rush grows along shore. Here and there the lake is shoal to the nearest island, about a mile off. The

rush grows thick on these shoals, which gives them a meadow-like appearance.

The road lies along the foot of the hills, very near to the water. There are a few potatoes planted in the sand; the patches extend to the road, which is just at high-water mark in the wet season. The potato plant is the only water gauge available; wherever the ground allows, the Indian carries his row, far from the rocky base of the hills, towards the lake, and the height of the eastern edge of his potato patch, above the level of the lake, is one foot. The potatoes are just coming up, sometimes accompanied by beans. A pig's tail was seen sticking out, as he had rooted down after the seed. The potatoes are small, but good.

The blue-winged teal, black diver, white and black gulls, feed in the water. Large and small snipe skim along the beach before us; while the tall white crane, with beautiful pink wings, legs and tail, with a black bridged bill, proudly strolls through the water. Green rushes and different colored feathers present a refreshing contrast to the dry rocks and dusty hills. In the small gullies may be seen a scrubby bush, some dry tufts of grass, and by very close search we did succeed in adding two specimens of flowers to our small botanical collection, which we hoped to have reported.

The Indians are going to town to celebrate the birth-day of the President of the Republic; old men are mounted on stunted little horses; young ones carry drums, fifes, and large feathered head-dresses, of pink and white, plucked from the crane; while the old women carry babies slung in cotton ponchos over their shoulders. The young girls bring provisions; and donkeys loaded with live chickens, to be sold in the plaza, jog along ahead of the families. On the lake a rush balsa, with a rush mat for a sail, loaded with fish and potatoes, presses on to meet the load of the donkey. An old woman is at the helm, which is a long pole; the wind seems a little too fresh for her; as she broaches to, her sail lifts, she loses command, and has to pole out of the rushes. The land party laugh at her, but she pushes and works with a will, though the heaving and setting of the craft makes it rather wet work, she finally smoothly sails into port.

From the small town of Chuiento we see the snow-capped mountains in Bolivia, on the other side of the lake—the loftiest mountains in the New World; with their silvery heads they cool the eastern winds; we are bewildered amidst these great works, while looking on with awe. José cannot understand the language of these Indians. We are among the Aymara tribe, who were subdued by Capac Tupanqui, the fifth Inca, but never adopted the Quichua language. José thinks there is

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little use in going among people that we cannot talk to. He says that his countrymen have often told him these people are very savage, or they might speak Spanish or Quichua! Richards tried English, but it was of no avail; they only laughed! Their manners, customs, dress, and general appearance is nearly the same as those of the Quichua tribes. The women are a little more chunky and rather better featured; they are cheerful, and they look up more—the usual effect of beauty all the world over. The men chew less coca, are stronger for it, and have a much more healthy appearance than the men of Cuzco. As far as I can see, there is very little sickness about Lake Titicaca.

The governor of the town sent to the post-house for our passports; they seem to be very particular with persons going south; he read, signed, and returned it by the postman. Inquisitive people go to the governor's house on an arrival, and after he reads the passport he passes it round. This is the way the arrivals are published here. On one occasion I unintentionally offended a roomful of men, by pocketing my papers as soon as the proper person had read them. It is the custom for travellers to present and read each other's passports on the road; you thus tell your nation, occupation, whence you came, and your destination—a very good foundation for a travelling conversation. Through the United States chargé d'affaires in Lima, passports from the government of Peru to all prefects in the departments through which I passed in South Peru overtook me. Passports from the supreme government are rare in these inland towns, and are read with the more interest.

The post-houses are becoming more respectable; some of them are papered, and near the bed and on the seats pieces of carpets are laid. The postmen are white creoles, with pretty wives; and the arrieros are dignified as postillions. Passing through the towns of Ocora and Ylave, we put up at Juli, which is situated, like the other towns along the lake, on a knoll with a perpendicular bank, rough and rocky, standing out into the water. The lofty Nevada de Sorata is in full view, said to be 25,380 feet above the level of the sea.

November 17, 1851.—At mid-day, air 51°; lake water 65°; wind east, right off the snow ridge opposite; temperature of a spring 54°. After leaving Juli the road turned among the hills to the right. We passed the night at Tambilla post-house, which stands alone at the base of the hills between us and the lake, inhabited by the postman, his postillions, and some Indian women cooks, who made us mutton soup, with potatoes. The plain is alive with cattle, sheep, llamas, horses, mules, and jackasses. The pasture is somewhat fresher. The wind draws through the valley from the north and is uncomfortably cold.

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By Lt L Gibbon U.S.N.

Lith. of P.S. Duval & C° Phil.

VIEW OF NEVADA DE SORATA, FROM THE WEST SHORE OF LAKE TITICACA. Peru.

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An Indian spade was leaning against the door-post, and while Richards stood intently looking at it, with his hands in his pockets, the Indians were closely watching him and talking to each other, as though surprised a spade should attract so much attention. At the end of a crooked stick of wood a rude iron plate, narrow and long, was fastened by a strip of raw hide; near the lashing was fastened, also in the same way, a cow's horn, on which the digger placed his foot. This spade is used for digging the soil on the side of the hill where the plough and oxen cannot go. In the wet lowlands long poles, shod with small iron plates, are used. One man pushes his pole into the earth, another puts in crosswise, and while they both pry up, a third, on his knees, turns the sod over with his hands. In this way they ridge the meadows and sow on the polled ground. The barley comes to head with very long beards, but bears no grain.

From the small town of Zepita the contrast between the snow-capped mountains to the east and the dark blue waters of the lake is remarkable. Here we succeeded in bottling two fish from the lake, without scales, about eight inches long, designed for Professor Agassiz.

The town of Desaguedero has a population of five hundred. At 11 a. m. we arrived, and found the governor busily employed at a fish breakfast. He was a cheerful, fat, polite, three-quarter-blooded Indian. In return for fish we gave him our passports; after reading them, he ordered the Indian servant to fetch a bottle of Ica wine. As he drew the cork he told me the Indians believed Lake Titicaca emptied its waters into the Pacific ocean by a subterraneous passage under the Cordillera range. They had found the Titicaca rush lying on the coast near Cobija, which differed essentially from weeds growing in salt water. A difference of opinion seemed to arouse him, and he said: "There are more than twenty different streams of water flowing from the mountain sides into this Titicaca basin, and not one has been seen flowing out; now, if I keep pouring wine into this cup, it will overflow and run down the sides, won't it?" Provided you do not drink it up as the sun does the waters, we answered.

After breakfast the governor walked to the river Desaguedero with us. This river is the southeastern boundary line of Peru. We were detained a short time at the bridge to allow one hundred unloaded llamas to pass from Bolivia to Peru. Rush balsas are secured side by side, bridge fashion, and a quantity of rushes piled upon them. They are kept in place by large rope cables fastened on each side of the river to a stone foundation. The distance from the shore of Peru to the Bolivian side is fifty yards. The river three fathoms deep under the

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bridge, with a current three-quarters of a mile per hour running south. The color of the water is blue; it is fresh and cool—temperature of 60°; the Indians drink it here. This is the only stream flowing out of Lake Titicaca. After running southwardly some eighty leagues, the water spreads over a flat, forming what is called Lake Pampas Aullagas, from which there is no flow into either ocean.

We were told that in the year 1846 there were heavy rains to the south of Desaguedero; the river flowed for thirty days north into Lake Titicaca; with that exception it is reported to flow as we saw it.

In the rainy season the river rises about nine feet, the rapid current often sweeps away the bridge; at the same time the flats on both sides of the river are overflowed. The width of the Desaguedero valley, at the outlet from the lake, is three-quarters of a mile, nearly all overflowed in the rainy season by the waters seeking an escape between the small hills on both sides.

At the southern end of Lake Titicaca the water is clearer, sweeter, and cooler, than it is on the north side. There is no offensive odor from the lake here. There are nine kinds of fish caught near the outlet, and as many of water fowl. Fish are found on the tables, while in Puno they are seldom used. We know on the ocean that currents of warm water pass through cold water like oil, refusing to mingle. The streams of cold water are quite as exclusive.

When Lake Titicaca is at its lowest it receives more water from the snow peaks on its eastern shore, than from any other source during the dry season. As the snow streams are generally clear, we concluded the cold water runs through the lake in *streams* towards the outlet. In the wet season, as the muddy streams fill up the lake, they deposit their loads of earthy matter on the western and northern side, which disturb animal life. The fish seek a quiet retreat and are, therefore, found more plentifully on the southern and eastern sides of the lake.

All the dead rushes, driven by the east winds to the west side, lodge on the flats and beach, manure the dry places, and deposit their seed; more rushes grow there to catch the sediment as the water filters through. Year after year the growth dies off, breaks down, and helps the upward levelling law. The rush grows from six to eight feet long. It is called *totora* by the Indians. The stalk is of the size and shaped like the blade of a bayonet, with a head and flower resembling clusters of ripe buckwheat. It supplies the place of wood, iron, canvass, and greens. The Indians were taught by the Incas to make bridges of it, over which they passed their armies; besides their boats and sails, houses and beds are sometimes made of it. An old Indian was seen refreshing himself with the juice at one end of a stalk, while his little child tickled another one's nose, and made it laugh with the flower. Such is the value and uses of this wild vegetable production.

We cannot understand why the population of those mountains have not cleared more lands at the base of the Andes, where their children would find beautiful flowers, and the men the real sugar-stalk; where they might tickle their noses with the fragrance from rich pine-apples and oranges, and where their tables might be loaded with the choicest vegetable productions. At the headwaters of the Madre-de-Dios Peru has a garden, but the lands in all directions seem almost a desert.

When Pizarro came with his followers, they found the mountains filled with silver; they helped themselves, and the Indians assisted them in doing so. Little or no attention was paid by the Spaniards to the cultivation of the soil, to the manufacture of wool, or the commercial resources of the eastern country.

As we step across the totora floating-bridge, we feel grateful for the many hospitable favors the kind people of Peru have extended to us as strangers. We shook hands with the old Indian governor, who was polite enough to introduce us to the custom-house officers and military commander in Bolivia. He laughed when told he was not a good Inca, because he did not believe that the evaporation was great enough to carry off all the surplus water from Titicaca, and that his ancient deity drank the water from this uplifted basin, and kept it from overflowing. He lit his paper cigar, and wanted to know when we were coming back.

There are only three or four government houses in sight on the Bolivian side of the river. The military commandant was very civil; he requested the custom-house officer to let us off easy, saying "they came to serve our country." The baggage was all taken off the backs of the mules; one or two trunks examined. The commander took great interest in our instruments; a woman in her riding dress begged permission to examine a needle and thread case which struck her fancy; she seemed to think it hard that a man had to do his own sewing.

Our road, dusty, rocky, and rough, lay along the southern shore of the lake. On the right were dry, barren hills; on the left, deep blue waters; and ahead, the heavy snow-capped range of the Andes, looked as though their weight was too much for the world to bear. The noonday sun is hot, but the east wind blows in our faces from among the snow peaks, which may be called the South American fan.

The winds from the Atlantic ocean rapidly run through the ravines and gorges of the great mountain range. The eternal glaciers cool the tropical atmosphere. Our animals travel with ease; as they breathe the

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refreshing breezes, they seem full of life and ready for a long journey, even after their day's work is over. These easterly winds on the table lands of Bolivia meet currents of air from the hills and mountain valleys. The different streams form whirlwinds, which draw the dust under our mules' noses, and run it up to the cumulus clouds above, where the dust seems to float about in the air. Some of these dust columns are of immense height, standing for many minutes, like waterspouts of the ocean. Infusoria, found in the blood, rains, and sea dust of the Cape de Verde islands, resemble that found on the Andes, in Venezuela. A scientific examination of this dusty road may possibly compare with a similar one in the southern parts of Africa. There is a battle-ground not far south of us, where there were left a number of dead, whose dust is carried heavenward by these winds.

Persons have seen hundreds of waterspouts standing on the water of the lake at one time, as though the columns were supporting the weight of the clouds. The Indians' balsas are built with so much beam, and being a bundle of rushes, shaped like a canoe before it is dug out, that the falling of one of the waterspouts only washes the dust off the Indians as they pass through this wonderful phenomenon. We are nearly suffocated at times with the whirling up of the dust all around us.

As we entered the small town of Huaqui, a man in uniform came out into the street, and requested to see my passport. He said he was not the governor, but the military commander. He was informed that we had none; we had not met with his government. As he assured us Peruvian papers were sufficient, they were handed over. Upon being returned, we received a pressing invitation to remain in his house and take coffee; but as José had prepared tea for us in advance, the commander joined us. He was a young man in a soldier's coat, which seemed to have seen service before he was born. It is amusing to see how much uncomfortable time a man can spend in a tight-fitting uniform, on the arrival of strangers. Outward show seems to be the sole object with the creole portion of the population. This man's employment is to read all passports of persons passing through this town, and he seems to be the only active business man in the place. He may be seen, long before the traveller arrives, standing in the street ready to demand, with a bold front, the license to walk or ride about over ground not crowded with population or vegetation. We change mules at Tiahuanaco.

To the northwest of us, and a little south of the centre of Lake Titicaca, is situated the Island of Titicaca, from which Manco Capac and his wife travelled to Cuzco. He was a navigator. The Island of Titicaca is surrounded by the Aymara tribe of Indians, whose language

was not understood by José, who spoke Quichua as well as his own. The valley of Cuzco is the first inviting spot to the northwest of this lake, and the road from it to Cuzco is level enough for a railroad. Manco Capac and his wife were carried by east winds, which blow every day across the lake, to the western shore, and travelled on foot the road we took between Cuzco and Puno, according to Indian tradition. Among the scattered stone remains of the ancient edifices of Tiahuanaco, we observed no resemblance to the stone-work of Cuzco, and were surprised to find that, although the ruins were in such a dilapidated state as not to enable us to make out the character of the structure, we could perceive, and were convinced of the higher order of mechanical art over that displayed in Cuzco. The stones, immense in size, were hewn square; one of them had an arched way cut in it large enough to drive a mule through.

The cura of the town told us there were no stone to be found in the neighborhood of the same sort, and that he did not know whence they had been brought. We have reason to believe Manco Capac had nothing to do with the ancient works of Tiahuanaco. Both the hewing of the stone and structure of the language of the people are different from his, though his first appearance was among these people.

We have faith in the peculiarities of the winds to aid the great work of populating distant portions of the earth. The northeast trade-winds of the North Atlantic ocean are fair winds for the emigrants of Europe to North and South America; and the southeast trade-winds in the south Atlantic ocean hasten the passage of the African to Brazil, the West India islands, and the shores of North America. Ships sailing around Cape Horn are headed off sometimes a month by the westerly gales. We are disposed to chart Manco Capac and his wife's track by the the instrumentality of winds in the South Pacific ocean, from the far West to the Bay of Arica.

At the gateway, near a Catholic church, was standing two heavy stone idols, with their hands crossed on their navels, as though there had been—as is now—a scarcity of food.

Tiahuanaco is a small town, situated upon a rise, in a wide valley, with a long view to the east. The ruins are close to the town, and from the level low ground towards the lake, no doubt the palace was originally built upon the shore, now out of sight. By a rough calculation, Lake Titicaca contains three thousand square miles. While we look upon the parched hills and table-lands on the one hand, and eternal ice on the other, it would seem this basin of ice-water was uplifted more than twelve thousand feet above the ocean, for the daily use of the sun

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as he passes. The evaporation is great, from the numerous streams which flow into the lake; and was the wet season withheld awhile, the basin would be emptied; but the precipitation and evaporation are now equipoised. As the lake is at its lowest, the rains will soon commence and fill it up again.

As the sun passes on south, he draws the rain-belt after him. He is now nearly vertical. When he completes his tour to the north of the equator, he returns next year to find Titicaca brimful, which is evaporated before the rains commence again. Were it not for the flooding of the lake every year, we might find the water salt instead of fresh.

We leave Lake Titicaca for the dry table-lands of Bolivia. On the road-side, at the base of the Sorata range, we halted to look at the Indians plough in their potatoes. The women were the planters. They plant the small potatoes of last year whole, instead of cutting the larger ones for seed. We attempted to explain to one of the women why she always raised such small potatoes; but she evidently misunderstood us. Running off to the end of the row, where there was a large earthen jar, she returned with a cup of chicha.

At Tambillo post-house, after passing the night, the postman was disposed to charge us double. His mules, like himself, look very poor. Half a dozen old houses stood out on the plain, with nothing about them to admire but the lofty snow-peaks. I hired mules to take us all the way to La Paz, but at Lapa they gave out. The postillions had them changed in the post-house, and wanted to continue with the fresh mules; but the Lapa postillions objected; and as ours refused to pay them that part of the fare which had been advanced, the subject was debated in the middle of the patio. A very respectable-looking old Indian walked in, and after speaking some time to the parties, our men paid, and we pushed on over the plain, in company with Indians and loaded jackasses on their way to market, and droves of unloaded mules on their return towards the coast, after having brought in loads of foreign manufactures.

Suddenly arriving at the edge of a deep ravine, we saw the tile-roofs of the city of La Paz, near the base of the great snow-capped mountain, Illimani. Descending by a steep, narrow road, and passing the cemetery, the air was found loaded with the perfume of sweet flowers. Springs of fresh water gushed out by the road-side, into which our mules sunk their noses before we could get a drink. As we entered the town, some one called out from a shaded piazza for our passports. We kept on, answering we had none for Bolivia; but on looking back, a man was seen stopping our baggage, which was a pretty effectual way of bringing us to.

After showing our Peruvian papers, an Indian was sent with us to the custom-house, and the police officer directed the man to show me the house of the gentleman to whom I had letters of introduction.

The most tiresome and troublesome part of the journey is the day of arrival in a large town, where we generally remain long enough to rest and pick up information. There are no hotels to which a traveller may go and make himself independently comfortable. Walking into a man's private house, bag and baggage, and handing him a letter of introduction, which plainly expresses that the bearer has come to make his house his home, is the custom of the country. We entered the most elegant house I saw in South America.

The gentleman of the house was not at home; he was engaged superintending the Indians at the gold mines and washings of Tipuani, situated north of La Paz, on a tributary of the river Beni, and to the east of the Sorata mountains. His daughter received the letter, smoking a large cigar, and invited us to join. Her husband was prefect of the province of Yungas, where is gathered the best cinchona bark. As it was Saturday, and 4 o'clock, the officers had left the custom-house, and the baggage could not be examined before Monday morning. Notwithstanding the lady of the house sent our letters to the prefect, and asked that we might have our clothing. We were in a house with four young ladies and no gentleman, so there was a poor chance of borrowing.

The party was a good deal sun-burnt, dusted, and harassed over the hot plains since leaving Cuzco, and all well tired out. Richards suffered, though he stood the travel better than was expected. José's beard had grown, and he had pulled an old white hat about so much to get it on the sunny side of his head, that he at once applied for part of his wages to purchase a new one. When we arrive, José always goes at once to pay his respects to the lady of the house, and through him a general sketch of our duties and characters are obtained. He is so polite, and of such an obliging disposition, that he seems to attract attention wherever he goes. He is fond of travelling, and, for so old a person, bears his part well, sleeps sound, and enjoys good health.

La Paz, the commercial metropolis of Bolivia, has a population of 42,849. It is the capital of the department, which has a population of 90,662 creoles, and 295,442 Aymara Indians. The small stream of water flowing through the city at the bottom of the ravine may be stepped across without wetting one's feet. As it dashes down through the Andes to the eastward, other streams join it, and after swelling out and gaining the base of the mountains, it is called the river Beni, which flows, in a northeast direction, through the territory of Bolivia.

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Some parts of the Beni are navigated by wooden balsas; but there are many falls, and the river-bed is rocky and rough, with a rapid current. The Beni is not navigable for steamboats. It flows through the wild forests, inhabited by uncivilized Indian tribes. On the tributaries of the Beni, gold is found, and the best quality of cinchona bark. By referring to the map, it will be observed that the tributaries of the Madre-de-Dios, in Peru, and those of the Beni, take their rise very near each other, in a line between the gold-washings of Tipuani and Carabaya. The waters of the former flow into the Amazon, while those of the latter go to the Maderia river. There is a ridge of mountains and hills between them.

A knot or hump seems to be raised in this part of the back-bone of South America, from which the water flows in different directions. The loftiest peaks of mountains are near, and the large lakes are found here. We see a cluster of wonders, from the hot springs of Agua Caliente post-house to the frozen peaks of the Sorata; extremes of heat and cold, large mountains, and small streams, dry winds, and lakes of water, in the richest gold region of South America.

The Beni creeps along the ridge of mountains as though seeking an outlet to the north. A passage letting the water through into the Amazon basin at the base of the Andes would probably make the Beni a tributary of the Madre-de-Dios, as it is erroneously laid down on some maps. It finds no outlet until it reaches the Madeira, to which it is obliged to pay tribute. Though the waters of the Beni do eventually find their way to the Amazon through the Madeira, yet the Beni, properly speaking, does not flow through the Amazonian basin, but through what we consider is correctly called the Madeira Plata.

The map will show that all the water flowing north, from the edge of La Plata river-basin, passes through this range of hills at one place—the head of the Madeira river. The countries drained by the tributaries of the Madeira comprise an area of 475,200 square miles—nearly as large as the basin of the Nile, and more extensive than either the Danube or the Ganges. The Madeira Plata is a step between the Titicaca and Amazon basins. It is separated from the Titicaca basin by the Andes, and from the Amazon basin by the range of mountains and hills at the foot of which the Beni flows. Its bottom is above the bottom of the Amazon basin, and should be treated of independent of that watershed. With the exception of a small portion, which lies in the territory of Brazil, it belongs exclusively to Bolivia.

La Paz is a most busy inland city. The blacksmith's hammer is heard. The large mercantile houses are well supplied with goods.

The plaza is free from market people, for there is a regular market-house. The dwellings are well built, of stone and adobe. The home and foreign trade appears to be possessed with a life seldom met with in an inland town, without shipping or railroads. The people appear to be active. There is less lounging against the door-posts. The place has a healthy appearance.

There is a theatre, museum, library, book and cigar stores, handsome stone fountains, well-paved streets, hospitable people, and a number of foreigners, a beautiful alameda, where there are lovely women, stunted apple trees, and sweet flowers. The Illimani snow-peak standing before us, is a cooler of the tropical winds which pass over the Madeira Plata. Strawberries, beans, onions, barley, and lucerne are produced in the ravines, but in very small quantities, as the space is very narrow. What attracted our attention among the people were new French bonnets the ladies were learning to wear, and the new French uniform caps the army had just received from Paris; both fitted like a new mountain saddle, rather uneasily.

In mid-day, when there is little or no wind, the inhabitants wear thin clothing; but as soon as the cold wind comes from the Illimani, bringing with it a shower of drizzling rain, the whole population change to thick cloth clothes. The climate is very changeable, and a consumption of thick woollen and cotton cloths are required, as much as thin cotton goods.

There is a police on the lookout for passports in the day, but I doubt if they are as strict in the performance of duty at night. Wines and spirits are the only articles Bolivia pays a transit duty to Peru upon. Bolivia receives most foreign manufactures through the port of Arica, in Peru, and as Peru is interested in the sale of her home-manufactured wine, she charges a transit duty upon all foreign wine introduced into Bolivia through her territory. Yet, while the duty and cost of transportation on the backs of mules from Arica triples its value, there seems to be more of this article used in La Paz than anywhere else, to judge from the noises made in the streets at night by parties of men and women, who roam about dancing and singing to the music of guitars; some of them play very well. Just opposite my window there was a wine store. In the door-way was chained a young tiger, and I noticed that nearly all the people who stopped to play with the tiger entered and paid transit duty to Peru.

The tailors are found seated along the pavements here in great numbers, but there are fewer churches than generally in a city of this size. The man who gets the contract to supply the standing army of Bolivia

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with clothing, accumulates a large sum of money. This is the business of importance in La Paz next to that of the trade in cinchona bark.

The largest portion of the department of La Paz is situated on the table-lands, which, like the hills and lofty mountains within its border, produce a scanty supply of vegetable growth—ocas, potatoes, maize, barley, beans, and quinua. Horned cattle, horses, and sheep are small and few. The llama is less used on the level roads of the Puna than on the rough roads of the mountains; mules are more valuable. The Indian nearly always walks to town in company with a jackass. Except a little dove dusting itself by the road-side, there are few birds to be found; no snakes nor ants; neither flowers nor trees. But that part of the department situated on the eastern side of the Andes—the province of Yungas—surpasses other spots in South America for natural wealth.

Standing up to his waist in the snows of the Illimani, amidst heavy storms of hail, with thunder and lightning, and a wind that dyes his nose and ears scarlet and blue with cold, the traveller descends to the east, plunging and tumbling among the drift banks. He passes sheets of ice formed by the melting of the snow at its lower edge, and after slipping and sliding down these glistening slabs, he reaches a green sod of grass, while the snow melts from his clothes as he thaws in the tropical sun. Behind him, above rages the winter storm; below a land of flowers in everlasting summer; and far off to the east, the whole earth looks blue and broken like the ocean. The drops of snow-water from his own coat join the trickling stream from the melting ice, and with him they move on down the rugged mountain. This stream, increasing as it advances, is finally lost in the waters of the Beni. He pulls off his overcoat, seats himself under the shade of a bush surrounded by sweet flowers; humming-birds attract his attention, and as he fans himself with his hat, a swarm of bees interferes somewhat with his comfort.

He soon reaches the shade of lofty trees; an old ring-tailed monkey walks slowly along a limb; a cunning little one jumps on her back, twists its tail round her hind legs, lays down its head on her back, sticks its fingernails into her skin, and rides its mother off at a full run, jumping from limb to limb and from tree to tree; while the father follows after, chattering in a loud voice the alarm for a stranger.

A long train of ants, disturbed in their march from one side of the path to the other, occasionally afford the intruder a bite through the stocking. He stops to change his clothes from winter to summer. Birds of most brilliant plumage sing all around him; some of them scream with joy as they fly across the mountain torrent; others are seated quietly in pairs on the branches, among the thick green foliage, as though

admiring or making love to each other. The forest stretches down the side of the Madeira Plata. The woods are ornamental and dye; the cacao tree, from which the best chocolate is made, grows wild. Coffee, tobacco, cotton, with all the tropical fruits, and the coca plant, are cultivated.

In the beds of the streams grains of gold are found. Among the hills there are two species of the cinchona bark, the best in the world. The forest is common to all persons who choose to employ themselves in gathering bark, and the impression is that the value of the forest in this article of trade is annually decreasing. The bark taken from the trunk of the tree "tabla" is the best; that from the larger branches, "charque," second in quality; and that from the smaller or upper branches, "canulo," the least valuable. A man may cut two quintals per day, which makes one quintal (one hundred pounds) when dried ready for market. The woodman will sell it at the stump of the tree at from eight to ten dollars the quintal.

By law of Congress, all bark gathered in Bolivia must be sold to a company having the monopoly of this trade, who pay, according to law, the following prices to the Yungas woodsman for his cinchona bark, carried over the lofty Andes and delivered at the bank in La Paz: "tabla," sixty dollars per quintal; "charque," thirty-five dollars, and "canulo," thirty dollars. The company pay twenty-five dollars per quintal on "tabla," and eighteen dollars upon "charque" and "canulo," duty to the government.

The bark is put up in cotton bales, each weighing one hundred and fifty pounds, covered with raw hide. Two bales, or three hundred pounds, being a mule load over the Cordilleras to the sea-port of Arica, where it arrives in ten days from La Paz, paying a freight of twelve dollars per mule load, so that a quintal of "tabla" has cost the company eighty-nine dollars.

The price in Arica varies from fifty to one hundred and fifty dollars per quintal, according to the demand for quinine in fever and ague countries. In 1851 it was worth one hundred and ten dollars the quintal; in May, 1852, it was as low as eighty dollars. At Arica it is shipped, and carried around Cape Horn, to the chemists in the United States and Europe, where it is manufactured, bottled, and some of it re-shipped and sold in the apothecary stores of La Paz to those who enter the province of Yungas, where the disease for which it is intended as a specific frequently prevails. The woodsman pays for one ounce of quinine the same price he sold one quintal of bark for at the tree.

Those who swallow quinine throughout the world are supposed to

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consume ten thousand quintals of cinchona bark per annum. We consider this a very low estimate.

The bank at La Paz has for some years past received as much as fourteen thousand quintals per annum, and the government of Bolivia issued a decree or proscription, forbidding the gathering of this bark from the 1st January, 1852, until the 1st January, 1854.

Gold was found in Yungas more than two centuries ago. The gold mines and washings of Tipuani are worked with some profit in the present day, but the wealth of the people engaged in gold hunting does not compare with that of former times. Hundreds of Indians were employed, turning the Tipuani stream from one side of its bed to the other in the dry season, and large quantities of gold were collected. Seven gold mines are at present worked in Yungas, and five hundred have been abandoned.

The roads to Tipuani are narrow, precipitous, and in an unimproved state, like most of the roads into Yungas. They require an annual expenditure of money, after the rainy season, to put them in order.

Merchants pay wages in advance to the Indians who consent to enter the mines, and provide them with provisions, which are carried in on mules. The expenses are very great in comparison to the yield of gold. The Indian is often sick, when his wages and the expense of feeding him are lost to the miner; many of them leave before their time, so that the work of the season is lost, the miner giving up poorer than he commenced.

Besides gold, there are silver mines in Yungas abandoned, filled with water. They are situated higher up than the gold mines along the eastern sides of the Andes. This side of the Madeira Plata is made of silver, washed with gold, filled with oranges, pine apples, granadillos, bananas, beautiful flowers, and rich green leaves, refreshed and kept in perfection by the sheets of ice and clusters of white snow resting on its edge. Streams of clear water, habited by fish, flow through the lofty forest trees, turning and winding among the hills, while the fish-hawk perches himself on the overhanging branch to watch them. The parrot, with his green leaf-like plumage, winks an eye as he digs his curved beak into the banana. The monkey helps himself to oranges; the humming bird feeds upon the product of the flowers. All are employed, joyful, and happy. Their songs echo through the hills, and die away among the dashing streams; but the ferocious tiger shows his teeth as he turns aside, snarling at the sight of the forked tongue of a dangerous serpent.

At the rising of the moon, swarms of bats fill the air, and insects float

about in the heavy atmosphere, seek their rest and all is still. The white wild goose sits by the side of the snow-water pool on the top of the Andes, and the dove sleeps on the puna by the side of the cactus thorn.

The most inveterate chewers among the Indians say, that the coca raised on the tributaries of Madre-de-Dios is superior to that produced in Yungas, on the waters of the Beni—the Yungas plant being at a greater elevation above the sea. In Peru, the planter goes well down into the flat lands, where the coca plant seems to flourish better than on the side of the Andes, in the ravines. Yet, seven thousand baskets of Yungas coca have been sold to Peru in one year; the usual price is five dollars the basket. Fruits, coffee, chocolate, tobacco, cigars, and about five hundred thousand dollars in gold and silver, are also exported to Peru; in exchange for which the department of La Paz imports from Peru rum, wine, sugar, sweetmeats, peppers of different kinds, meats, potatoes, and cheese.

The value of the imports of foreign manufactures into this department, in silks, coarse cotton and woollen cloths, calicoes and fine cotton goods, iron, earthen, and glass-ware, amounts to about five hundred thousand dollars. The value of the Cinchona bark and copper exported is three hundred thousand dollars, with two hundred thousand dollars in gold and silver. The difference is exported to keep up the balance of trade, which makes the foreign trade of this department worth about one million per annum, exclusive of the internal traffic with Peru.

The city of La Paz is the largest in Bolivia, and has the most trade, owing to its position between the provinces of Yungas and Arica. But the foreign manufactures imported by this country, do not all pass through La Paz. The roads from Arica and Cobija lead direct to the southern department, and the trains of mules and jackasses cross floating totora bridges on the Desaguedero, such as we saw the llamas pass near the Lake of Titicaca. The distance from La Paz to Cobija is two hundred and thirty-two leagues.

In the first part of December, when the flowers begin to bloom in the ravine, it is the custom of the inhabitants of La Paz to repair to the alameda before breakfast. Some go on foot, dressed in silks and satins, broad cloth and white kid gloves. The ladies without bonnets, their hair parted in the South American style, appear to much more advantage than those in French fashions. The gentlemen are also more natural in their vacuña-made hats than in those of Paris. Indian servants walk behind the family with rugs, which are spread for the ladies to sit upon. Gentlemen make a grand show with spirited horses, but

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are completely outdone by ladies in the management of their animals, and in graceful riding. Some of the countrywomen ride on men's saddles.

The girls ride off at full speed through the alameda, like a frigate's complement of midshipmen on a day's leave of absence. More of the men's stockings are exposed to view than those of the ladies.

The men of Bolivia are better developed and more spirited than they are found near the equator. Their horses are generally small; some of them are full of life and spirit, and prance about more like little goats than a well-trained blooded animal.

Milk is drank at the end of the exercise, and the meeting of the families is very agreeable. The degree of politeness and pleasantness of manner is remarkable, while the milk of cow kindness is passed around in large glasses. The fresh complexioned Spanish beauty rides up, tosses off a bumper, calls to her indolent escort in her sweet language, and off she goes again, followed by the eye of a fat John Bull, luxuriating over his glass, with a broad brimmed hat on one side of his head, and a walking stick under his arm.

The foreigners of La Paz purchase the dried mutton of Peru, and supply the Indians, who work near the town of Corocoro, where copper is found in great quantities in its native state, and is worked with great difficulty for want of proper tools. The export duty, paid by the merchants to the government, is six cents per quintal on ground ore, and twelve cents on bars of pure copper.

The Indian men are not muscularly strong, though they accomplish a gread deal in their own way of working. They are slow and sure men, when well treated. The stone-work of the fountain in the plaza, carved by the Aymara Indians, compares well with the best we have met. It is admired by the Italians, Germans, French, and English residents of the city, and however much we respect the Quichua tribe, we must give the Aymaras the preference in this mechanical art. They are more musical, and seem to possess a more independent character than the Quichuas; yet they cannot compare with the North American negro slaves in health, strength, happiness, comforts of life, or liberty. African slavery existed in Bolivia before the meeting of the National Convention in September, 1851, when the fifth Bolivian constitution was sanctioned; the first article of which declared that "All men are born free in Bolivia." "All men receive their liberty upon placing their feet upon her soil; slavery does not and cannot exist in it."

In this convention, a member of intelligence and experience—a man as popular as any, and respected by most of his countrymen; well acquainted with the history of Bolivia, and who had been a public man from her birth as a nation—offered an amendment to that constitution, proposing to establish religious liberty in Bolivia. The whole convention at once opposed him, as did the two little public journals in La Paz; and when the bishops, priests, and church of Bolivia came out against him, it became a question, whether a patriotic, aged, and tried senator was a freeman!

The fifth article of that constitution declared, "The Apostolic Roman Catholic religion was that of Bolivia. The law protects and guaranties the exclusive worship of it, and prohibits the exercise of whatever other," recognising notwithstanding the principle, that "there is no human power over the conscience."

With political affairs the Indian has little or nothing to do. When the creoles side off on the level plains of Bolivia and fight the battles of their country, the Indians seat themselves on the brows of the hills around, and quietly witness changes or continuance of administration. They seem to be the philosophers of the country, and to take the world very easy. After the struggle is over, they come down and pursue their daily occupations under the new constitution, laws, and powers that be.

The beautiful house in which we are was, on one occasion, turned into a barracks for the soldiers of the victorious party, and the ladies driven out, because they agreed in their political opinions with their father and brothers. The officers were thought kind because they had the most expensive furniture put into their own rooms, that it might not be entirely ruined before the family had been sufficiently punished.

At the dinner table a young family of fourteen are seated, full of life and gayety. Our place was next the lady of the house, who presided. She was very intelligent, and had greater advantages of education than most of her countrywomen. She seemed particularly fond of the United States—asking many questions—expressing her admiration of the people, but disapproving of some of their actions. She thought the country too warlike; and although we had conceived our answers satisfied her, with regard to Texas and California—of which she had very incorrect ideas—she asked me to explain to her the meaning of all the articles she saw published in the newspapers of La Paz, upon the subject of Cuba. Turning suddenly, she looked up and said: "What are you doing here, Señor Gibbon; do you want Bolivia, also?" After setting forth the advantages of trade through the rivers of Bolivia, and the difficulties the people of her country now labored under to avail themselves of foreign commerce, she approved of the enterprise, and expressed

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herself friendly to it; but concluded by saying—"I believe the North Americans will some day govern the whole of South America!"

Our conversation was disturbed by the entrance of an Indian servant girl, with her mistress's youngest child, which was seated between us. The Indians teach the children their own language. The habit of using the most easily pronounced words in Aymara and Spanish had produced a very curious mixture. The Aymara for baby is "wawa." A gentleman seated opposite inquired if I was fond of them. Never having heard the word "wawa" before, and believing he said "guavas"—a fruit upon the table—he was answered in the affirmative, with the addition that they "were much better when preserved than when eaten raw." This brought forth a shout of laughter.

The daughter of the lady, with tears in her eyes from merriment, inquired whether I had ever eaten one? Being told that I had devoured hundreds, and would take one now if she would be so kind as to give it to me, the Indian girl seized the wawa, amidst continued roars of laughter, when Havana cigars and Yungas coffee were introduced.

The markets of La Paz are well supplied with fruits and vegetables from Yungas. Near five hundred thousand baskets of coca are produced there annually—a basket contains twenty pounds. Some twelve hundred baskets are exported to the Argentine republic; the remainder, after the sale to Peru, being consumed at home. The organized national guard, or militia of this department, amounts to about fifteen hundred creoles, regulated by special laws, independent of the standing army of the country.

The prefect of La Paz was friendly to the expedition, and assured us his government would be so. His duties correspond with those of the prefects in Peru. His department is divided into provinces, which are ruled by governors; there are no sub-prefects in Bolivia. The most intelligent men in the country are found among the prefects. The impression is, that preference is given to this office over that of a ministership in the supreme government.

With a fresh supply of passports and letters, we mounted our fattened mules, and bidding farewell to our kind friends, we ascended the steep side of the Quebada to the table lands, which slope down from the Illimani to the westward, towards a low range of mountains. The wind was fresh from the southeast; thunder in the north, and a cold drizzling rain falling. The plain is covered with round stones, such as are found on the shores or in the beds of rivers.

December 2, 1851.—At 4 p. m., we halted at Ventilla post-house. Thermometer, 52°; wet bulb, 42°. The fat postwoman was picking

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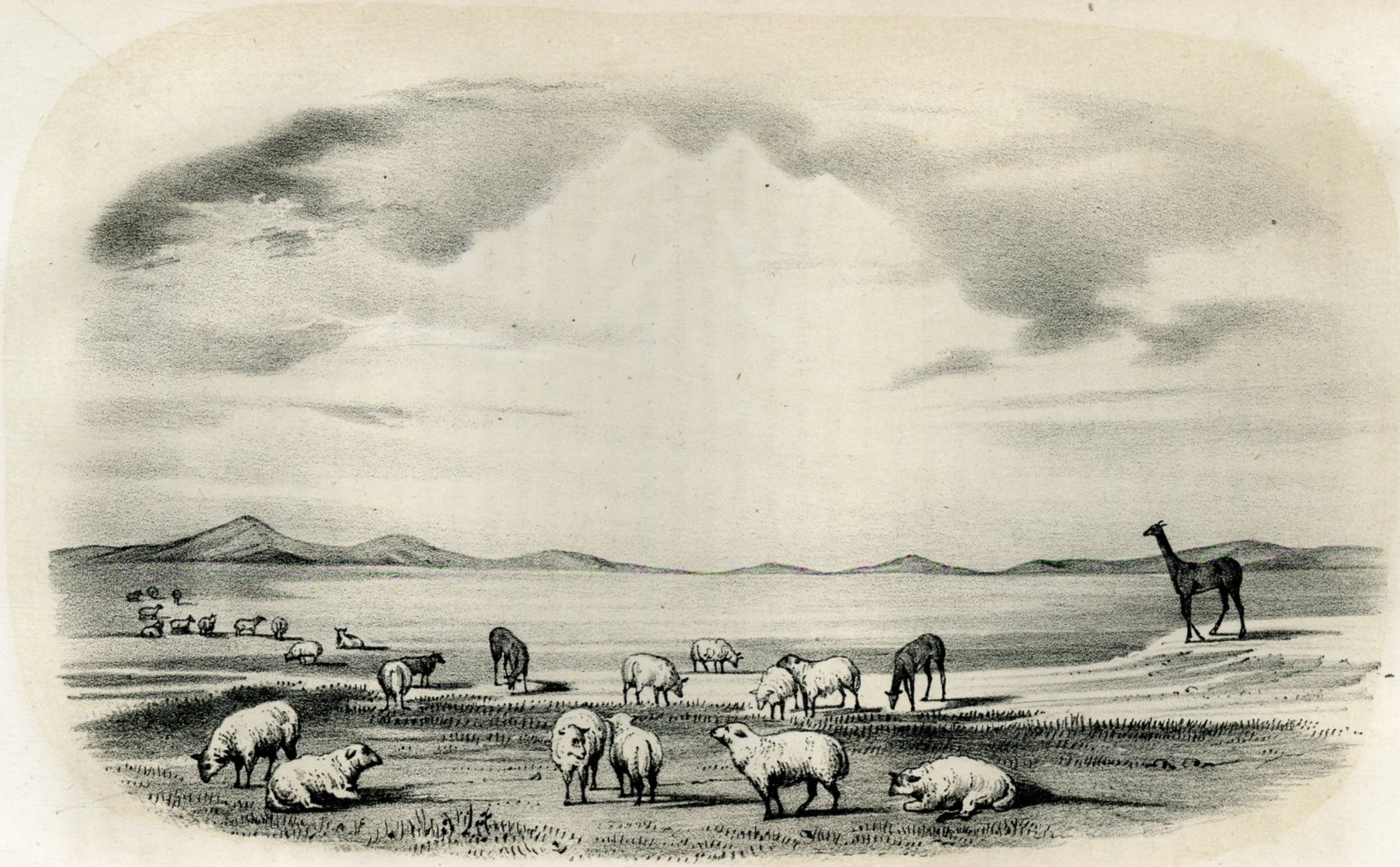

By Lt. L. Gibbon U. S. N.

Lith. of P. S. Duval & Co. Phil.

ILLIMANI SNOW PEAK, VIGUÑA'S PASTURING WITH THE SHEEP ON THE PUNA OF BOLIVIA.

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seeds from a bag of raw cotton. She gave us a specimen, but said she did not know whence it came. From her external appearance, we judged she had not travelled much about the country.

The house stands on a barren plain; not a living thing to be seen growing, except a short tuft of grass here and there. The post-dogs are miserably poor. The baggage-mules look as if they ate round stones and drank bad water. As the dogs and children came to us for supper, we are at a loss to know how it is the old woman keeps so enormously fat. Possibly upon happiness, for she seems perfectly contented.

It has been a matter of surprise how the globe is so well balanced, while the greatest proportion of land appears on the north side of the equator. After a view of the lofty mountains, corpulent bishops, and portly postwomen, it seems more comprehensible.

We are now travelling on the edge of the Titicaca basin. The water on the west side of us flows into the Desaguedero river, and that on the east side into the Beni. The rich copper district lies to the west of us, near the Desaguedero. There is snow on the mountains in all directions, the Illimani appearing high up in the east. Three vicuñas were pasturing with some sheep near our path. At the small town of Calamarca, at 4 p. m., thermometer, 48°; wet bulb, 40°. A rain-storm from south-east, accompanied with thunder and lightning, hauled round by south to the west, when the small drops of rain became frozen, and fell in hailstones, the size of very small peas; after which the whole country in sight was covered with snow.

The scene is a cold and dreary one, made more so by the strange noise of wind instruments and drums in the plaza, as the Indians march through the church after the storm, dancing with war-clubs at the doors, while a cracked bell chimes a deafening summons to prayers. The wind instruments are made of a succession of reeds of different sizes and lengths, upon which they blow a noise, little resembling music to our ear, keeping time with the drummers, the slow-motioned dancers respecting them both. The Indians are dressed in large feathered hats, white cotton shirts, short trousers, decorated about the knees with red, blue, and white ribbons, while one in deep black walks before the procession in the character of drummajor. Except a priest, not a creole face was to be seen.

In the morning the procession marched into the patio of the post-house. After they had played and danced some time, the Indian women came out, and being joined by the postillions, formed a ring inside the musicians, and the dance was continued. We seated ourselves, with our tin pots of tea, in the doorway, looking on. After the dance, the women

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retired, and the postman, a fine-looking old Aymara Indian, hat in hand, made a speech, in a grave and earnest manner, to which they all listened with silent attention. The speech was responded to by a long blast from the wind instruments and a few heavy taps on the drums. Then the postillions, one by one, made short speeches, and were answered in the same way. The women again appeared, each bringing with her a jar of chicha, which they served out in cups, giving to each individual as much as he could drink, which was no small quantity, for the morning was cold. The music again struck up, and the women again joined in the dance. One of them came out with her sleeping "wawa" slung to her back, which was soon blown up, and commenced a laughable discord; but not a smile could be discovered in any of their faces; neither did the woman stop till the dance was ended, when she swung the child round in front of her, where it found cause to be quiet.

As we could not understand the language or the meaning of the speech, nor the propriety of chicha being introduced into the religious service, we supposed the intention was to serenade the women, but were left in doubt; for they seemed to be so serious, formal, and earnest that it could scarcely be a frolic. At first we were disposed to appropriate it to ourselves, but gave in on the appearance of the chicha.

These Indians are very polite and attentive to us. We find no difficulty in getting what we want, notwithstanding José is as perfectly ignorant of Aymara as ourselves. When we were ready to leave, the old Indian took out of his own pocket, and laid upon the palm of his hand, the amount of our bill for the night. Being paid, he nodded his head, smiled, and uttered something that seemed to us satisfactory.

The town is small and wretched, both in its external and internal appearance. Not a foot of the country in sight around it is cultivated. The principal production seems to be chicha; but the maize it is made of is brought from the Quebradas to the eastward.

To the west of Calamarca, between the Desaguedero river and the Cordilleras, near the town of Benenguala, in former days, were worked a number of silver mines. Seven hundred mouths are open and filled with water, having all been abandoned in the present day, though they are reported to be rich. To the east of Calamarca, in the province of Inquisivi, five silver mines are worked, and one hundred and sixty stand idle. Near the town of Araca four gold mines are worked, and many more exist.

Crossing a dry, rocky country, we came to where the plain was covered with green cedar bushes, about two feet high; the dry, dusty road was made more cheerful by cattle, sheep, and llamas crossing our

path. They were feeding upon the fresher grass that springs up under the shade of the cedars. The change from the barren, unproductive places on the Puna to that of a vegetable growth is so sudden, that the traveller is, at first sight, struck with wonder and surprise, because evidently no human power has been brought to work here. It is all the result of original, natural laws.

Man seems the most unnatural creature we meet with. He builds his house in a desert, settles himself in a country he cannot cultivate; while other animals are seen in numbers the moment we come in sight of vegetation, nor do they leave it for the barren places unless forced to go by the more intelligent creature.

The southeast winds that we meet here come across the South Atlantic ocean; passing over the lowlands, they strike against these mountains. Rising from the vapors of the sea, they are wet; but after travelling over dry lands, their dampness is distributed on the soil, and there springs up a growth of forest trees and wild flowers, which otherwise would be burnt down by the fiery rays of the sun.

By the time the winds reach these lofty mountains they are comparatively dry. The little dampness remaining in them, meeting with the cold atmosphere of the mountain peaks, freezes and falls in the shape of snow or hail.

Being relieved of their load, they come down on the table lands now, where we meet them after having performed their work, as on the west of the Illimani; there the plain is barren; not a living bush is to be seen. As the winds have no moisture to give to the soil, the soil has no vegetation to give to animal life; therefore, man appears to be struggling against this law, by living all his life to the west of the Illimani, where the winds are on a frolic, dancing over the plain, forming whirlwinds, and shooting up to return from whence they came.

These winds go back to the South Atlantic by an upper current. But, to return to the cedar bushes. We can only account for them by supposing an opening in the Andes range to the southeast of us, through which the winds come, before meeting with mountains high enough to push them above the perpetual snow line. We cannot see far enough to tell, but have to feel our way. Yesterday we had the Illimani to the east of us, and by the reflection of a barren soil, the rays of the sun scorched the skin off our faces. To-day, although the sky is equally as clear, we do not feel it, the atmosphere is more moist, which protects the skin from the influences of the sun.

But there stands a more convincing proof of this natural law, and of our supposition of an opening in the Andes to the southeast of us. The

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mountain peaks to the west are covered with snow. The remaining moisture in these winds has not yet been turned into hail and snow, but is still doing its summer work. The moment it strikes those mountains to the west, however, then it will all be grasped by the cold hand of winter.

We have heard the people of this country complain that there is less law in Bolivia than in any other part of the world. We doubt if there ever was a law more plainly written than is here seen on the face of the soil, directing attention to the countries east of the snow.

We observe an alteration in the color of the people on the Puna, who differ again from those of the forests. The Indian who lives on the west side of a snowy-peaked mountain is burnt black; those among the cedar bushes, to the east of the snow, are lighter in complexion. The women are better looking. The sun-burnt man falls in love as soon as he gets to the east side of the snow peaks, although the people of the forests in the Madeira Plata are whiter still. We have seen no curling of hair produced on the Puna by the excessive heat of the sun.

CHAPTER V.

Silver mines of Sicasica—Productions of the Puna or Table lands—An exile returning home—Department of Oruro—Silver, copper, and tin—Climate—A chicha factorer—The expedition out of Titicaca basin and into Madeira Plata—Department of Potosi—Population, climate, and productions—Rio Pilcomayo—Mint—Quicksilver trade—Imperfect mining operations—Smuggling of precious metals—Statistics of silver—Trade with the Argentine Confederation—Port of Cobija—Desert of Atacama—Eastern side of the Andes—Frosty mountain tops and thermal streams—A Washwoman—Cinchona bark ascending to the South Pacific—Department of Cochabamba—Increase of creoles—Incas colony of Quichua Indians—Hail storm—Gardens—Fig trees—City of Cochabamba—Hospitality of the merchants—The President of Bolivia and his cabinet—Commercial proposition—Brazilian minister—President Belzu—Cavalry and infantry—Armor of the Bolivian troops—Public force—Calacala gardens—Market people—Rio Mamoré—Legislative power—Church ceremony—Climate—A bishop's opinion of the consequences of steamboat navigation—Cabinet ministers—Reception of a farmer by the President—Heavy shock of an earthquake—Sudden departure of the Government—Clisa Fair—Trade to the Pacific coast.

After changing our baggage mules at the small Indian town of Ayoayo, we came to a winding stream, a tributary of Desaguedero, on which was a grist-mill, and arrived at Chicta post-house, which stands alone like a toy-house in the middle of this green-carpeted plain. At 5 p. m., December 4, 1851, thermometer, 52°; wet bulb, 42°. A view of sunset over the snow-peaked mountains is most beautiful. The post-house is well kept by a creole with a wife and large family of children.

Three hundred Indians work the silver mines in the neighborhood. In this province, Sicasica, there exist three hundred and twenty abandoned silver mines. The yield of the nine mines at present worked produces some profit, but no fortunes are made by those concerned. Antimony and stonecoal of good quality have been discovered.

During the cold nights here, dew from the damp winds freezes. We observed no dew to the west of the Illimani.

As we move to the southeast the bushes are larger; some of them are three feet high. A moss grows, besides the sprigs of grass, on which the llamas feed, as they slowly move under loads of grain on the way to the grist-mill.

Scarcity of vegetables appears to produce an intimacy among animals.

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Here the sheep graze in flocks, exclusive of horned cattle or horses, and the vicuña keeps aloof from all; but in less productive places, vicuñas are found eating from the same scanty table with the sheep and llamas. Animals which inhabit the highest atmospheres are obliged to come down among those below them.

The Puna seems the natural elevation for sheep; they thrive best there. The llama don't do so well. The place of the vicuña is between these two mountainous distributions of animal life. Horned cattle and horses are above their station here, and thrive badly. The hog dives down into the very sloppy bottom; his greediness could not be satisfied on the upper plains; he would certainly perish for want of food, and is never found at such altitudes, unless forced up.

There is a sparse population and very little cultivation. The people are supplied with grain and fruits from the ravines on the edge of the Madeira Plata. We changed baggage mules at the town of Sicasica, a flourishing place during the days of wealthy miners, but an uninteresting and lifeless Indian town now.

At the post-house of Oroma, where we spent the night, a party of gentlemen stopped for baggage mules. They were travelling in haste, one being on his way to La Paz to join a wife and children after a banishment of eighteen months. His expressed political opinions happened to differ from those who came into power by force of musketry. His friends had obtained permission for his return, giving security he should not offend in the same way again. He pointed out on the map his wanderings through the wilds of Eastern Bolivia and the province of Matto Grosso in Brazil, and described his sufferings. He had not heard from his family, not knowing, until lately, they were still alive. He laughed and joked about his troubles, as though happy at getting home again.

A priest of the party sat on the baggage listening to our conversation. One inquired if the President of the United States sent those out of the country who expressed political opinions in opposition to his own, and really seemed surprised to learn that sometimes nearly half the nation did not agree with our President in all things, and were not interfered with.

Changing mules at Pandura post-house, we arrived at Caracollo, in the department of Oruro, which contains a population of 8,129 creoles and 86,943 aborigines. This department has produced a large amount of silver.

The city of Oruro, the capital and largest town in the department, has a population of 5,687. One hundred and twenty years ago, it contained a population of 38,000, without counting Indians. This decrease is accounted for by the state of the mines.

There are twelve hundred and fifteen abandoned silver mines near the town, and not less than two hundred gold mines, most of which contain water. Eleven silver mines are still worked.

In the province of Poopo fifteen silver mines are worked, and three hundred and sixteen stand idle; besides which there are four silver mines worked in the province of Carangas, and two hundred and eighty-five abandoned. On the discovery of a mine, it is reported and registered to be taxed. The miners of silver ores are required by law to sell their metal to the government at a certain price. As merchants are willing to pay higher, the silver of Bolivia often passes out of the country in bars. Gold may be exported by paying a duty of three per cent.

Lead, iron, antimony, sulphur, copper, and tin abound in this department; the tin is found on the surface of the plain.

The climate of Oruro is cold, and the soil very unproductive. Potatoes, quinua, with a little barley, are raised in some places. Llamas, alpacas, vicuñas, guanacos, and the skins of the chinchillos, are used as exchanges on the coast of Peru for rum and wine.

From shallow lakes salt four inches thick is gathered, and exchanged for grains and flower. The pasture is so scarce that few cattle are raised. Jackasses being more economical than horses, pick up a living on the plain as they carry salt to the cattle districts, or journey over the mountains with silver and gold, a distance of one hundred and eighty-three leagues, to the seaport of Cobija, where they meet ships from the United States loaded with flour.

Cobija is a free port of entry, and merchants send this distance for many articles of trade, in preference to paying duty from Arica through the territory of Peru. As the jackass travels very slowly, and the Indian driver generally accommodates his pace to the loaded animal's, the cargo from Cobija requires thirty-five days. It is difficult to find men willing to make the trip over that barren country.

The inhabitants of Corocoro were generally intoxicated on our arrival; neither the postman nor the governor appeared. Two persons, incorrectly supposing they were sober, called for our passports, saying the governor was absent, and they were the authorities next in power. One of them encountered some difficulty in reading the document.

He inquired of José the reason it was not presented at the governor's house? José answered, "It was usual for the authorities to call upon strangers." The man became very angry, and abused José. Being requested to read our papers and take his departure, he said "he did not

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know whether we were English or French gringos." We pointed out to him the words "Los Estados Unidos;" when looking up with surprise, he bowed, touched his hat, and bidding us good evening, they quietly and quickly walked off. I mention this fact solely because it was the only case throughout our route where a personal difficulty with the authorities was encountered; having to deal with such a number, it was the only exception to politeness and accommodating manners—possibly occasioned by some foreign importation.

The town is on the decline; it looks so dilapidated, and like the dusty, unproductive country round about, that had it not been for the church steeples and the chicha, we might have passed without having seen it. A cura, travelling with his servant, left his intended road and joined us for company. He had been on a visit to La Paz from Sucre, the capital of Bolivia, with a remittance from the church. As we rode along on the table-lands, he would point out an unusually level piece of ground, and say, "What a beautiful place for a battle between two armies." The man who had carried the remittance to La Paz trotted on foot after us, and travelled every day as fast and as far as the cura with his fine bay mule. We read each other's passports.

Stopping on the plain at a small hut, the only habitation in sight, except a large stone church, we inquired for water; there was none, but a fat woman said she had chicha. The cura purchased a gallon for the same price other people usually pay for a pint. The woman said "she had chewed the maize for it herself;" so we had the manufacturing apparatus before us, established without wheels or water. She kissed the cura's hand, and asked for his blessing. With one hand on her head and the other occupied with the chicha jug, he uttered a short prayer, tossed off the beverage and mounted his mule.

Our course is now east; we leave the table lands and enter a small narrow pass in the Andes. As the sun goes down over the Cordilleras, the hawks go to roost among the rocks. All is still as we ride up to a lonely hut—the post-house of Condorchinoca; while the Indian attends to our mules, his wife cooks supper, and his little child plays with the post dog. The night is clear, calm, and cold.

Ascending the western side of the Andes we come to a spring at the temperature of 68°; the water flows westward. We are now about to leave the Titicaca basin, which contains an area of thirty-nine thousand six hundred square miles. It is a curious basin; all round its edge snow is found, from which numerous streams of water flow and wash away the soil, so as to show that the earth is partly made up of silver

If, during the rainy season, an unusual quantity of water is poured

into its southern side, the large stream passing to its bottom flows northward; but generally most water enters on its northern side, so that the water nearly always flows south. Its climate may be a healthy one, but not a hospitable one for man.

In some parts of it sheep and vicuña flourish, and the llama was thought, in this basin, to prove in better condition than elsewhere. Our observations go to show they and the sheep in the neighborhood of the Juaja valley, in Peru, are superior.

The mineral wealth of the Titicaca basin is very great, but its vegetable productions too small for the support of its present population, who are employed extracting metals, and who draw from the Madeira Plata many of the necessaries of life, and rely upon foreign countries for their manufactures.

A clear, deep-blue sky opens the day; but as the tropical sun shines upon the white edges of the basin, he evaporates so many feet of the snow per annum, that the clouds formed daily seem to curtain in the inhabitants from the rest of the world.

The Aymara language and people excite the imagination to a belief that their history is of an anterior date to that of the Quichuas, and more interesting to those who seek, in the depths of time long passed, for a knowledge of the origin of the aboriginal races of men on this part of the earth.

There is a peculiarity found in the Titicaca basin which we noticed, but are unable to solve—the wind blows all the year from the east over the lake, while on the plains it is variable and whirling. Water appears to attract wind, and to keep it in active motion.

Slowly winding our way up the Andes, meeting droves of llamas loaded with flour, we find the strata of rocks pointing to the east at an angle of 45°. Arriving at the top of the great ridge, the strata is perpendicular; and on the east side it inclines to the west, also at an angle of 45°.

We now look over the Madeira Plate, but before entering it we turn to regard, from these lofty peaks, the south of the Titicaca basin.

From the line of the twentieth degree of south latitude, water flowing north belongs to Titicaca, and that running south tends for the great La Plata basin. These are the waters of the river Pilcomayo, which empty into the Paraguay between latitude 25° and 26° south, after passing through more than six hundred miles of longitude.

The Pilcomayo is a rapid stream, with falls and a rocky bed, like the Beni. It appears not navigable for steamboats in the territory of Bolivia. This stream takes its rise in the department of Potosi, which lies between

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Oruro and the Argentine confederation, and contains a population of 83,296 creoles of European descent, and 164,609 Aymara Indians.

The city, situated at the base of the far-famed Cerro de Potosi—the rich sister of Cerro de Pasco, in Peru—has a population of 16,711.

In the Cerro de Potosi and neighborhood there are twenty-six silver mines worked, and eighteen hundred standing idle. Besides which, the government accounts show us that, in the provinces of Porco, Chayanta, Chichas, and Lepiz, there exist three thousand and eighty-nine silver mines which have been abandoned, and only sixty-five mines worked now.

In former days the department of Potosi excited the envy of the world. The silver ore was found rising from the top of the peak; the vein being followed below the water-line, when it was given up and a new one sought. The work was carried on in this manner until few new veins remained. The people are now burrowing in at the base of the peak, striving to strike the vein below, where it was left in its richness. This is an expensive business, and some have given up the plan, after an unsuccessful entrance into the very core of the mountain, with heavy losses.

There is a mint at Potosi, where the miner finds a ready market for silver and gold. It received and coined in the year 1849 one million six hundred and twenty-one thousand five hundred and thirty-six dollars in silver, and eleven thousand nine hundred and eighty-four dollars in gold.

The government purchases quicksilver to trade with the miner. It is a singular fact that, while the rich quicksilver mines of Huancavelica are so close at hand, Bolivia annually imports two hundred thousand pounds of this important fluid mineral, in iron jars, from England, around Cape Horn, and over the Cordilleras, one hundred and fifty-eight leagues from Cobija.

Owing to the imperfect apparatus used for separating quicksilver from the silver ores, the waste of the imported metal is very great. Five thousand pounds of ore, yielding one hundred and fifty pounds of pure silver, required four hundred and fifty pounds of quicksilver for the amalgamation; of which, I was told, not less than one hundred pounds were lost. A simple cast-iron silver burner, or distilling apparatus, would probably save half this waste, and certainly much labor—both the labor and mercury being the most expensive items in the miner's list of expenditures.

It is supposed that much silver is smuggled out of Bolivia every year. The miner hands one bar to the mint, while another he pays to the merchant for clothing, rum, coca, and so forth, for the use of the Indian laborers, from whom he reaps a profit in the retail business.

It is difficult to get a near estimate of the real annual amount of silver and gold taken from the mines of this country. The following table, taken from the government account, may prove interesting. It is the yield of these two metals given every five years:

From 1800 to	1806	$21,186,460
	1811	16,288,590
	1816	10,789,816
	1821	9,749,350
	1826	9,089,787
	1831	9,784,620
	1836	9,848,342
	1841	9,678,420
	1846	9,789,640

However much short of the annual product, this table may show at a glance the decrease under the present system of mining.

The climate of the city of Potosi is cold and unpleasant, being elevated over fourteen thousand feet above the ocean. The vegetable productions in its neighborhood are less than are found on the plains of Oruro. The llamas, alpacas, vicuñas, and guanacos, are large and valuable.

Rock salt is found among the mountains in large veins. Small springs of water shoot up and flow down the La Plata basin, uniting in streams which wash away the earth from silver, gold, copper, tin, and precious stones. These streams run rapidly to the base of the Cordilleras; there meeting expanded plains, they form lakes, which are evaporated and leave a crust of salt. Numerous streams, passing on to join each other, finally cut their way boldly through the Andes, where they become large enough to accommodate schools of fish. Then the Indian is found planting maize and potatoes; sowing wheat, barley, and lucerne; raising horned-cattle, sheep, and horses. He buys salt from the up-countryman, and gives him salted fish in payment, or receiving hard silver dollars for beef, mutton, and flour.

Near these tributaries of the Pilcomayo, at its head, the Indian plants sugar-cane and coffee. His wooden hut is shaded by the trees of the valley, and his doorway decorated with the chirimoya and granadilla plants.

The Pilcomayo is a muddy stream. It creeps along at the base of a ridge of mountains, which stretch towards Brazil, as though seeking an

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outlet to the south before it trends to the Paraguay, as the Beni runs to the Madeira.

The department of Potosi imports from the Argentine Republic annually about five thousand mules, eight hundred horses, and five thousand jackasses, and three thousand head of cattle. A mule is worth twenty dollars, a horse fifteen, a donkey six, and beeves ten dollars a head.

Bridle-reins, stirrups, saddle-cloths, soap, and tobacco, also enter, for which silver is paid in exchange.

Chinchilla skins are worth seven dollars the dozen; hides, two dollars each; coffee, from Yungas, twenty-five dollars per quintal of one hundred pounds; sheep's wool, twelve dollars; alpaca wool, thirty dollars; tin, twelve dollars; bar or pure copper, sixteen dollars and fifty cents; Yungas chocolate, twenty-five dollars; and vicuña skins, forty-three and three-quarter cents.

There are imported from the Pacific coast annually six hundred thousand dollars worth of silks, woollen, and cotton goods.

The foreign trade with Potosi is principally carried on through the port of Cobija. The road passes through the great desert of Atacama, which is called "Departmento Litoral."

Among the lofty, barren Cordilleras, the donkey driver finds it difficult to climb the steep roads, or to descend into the deep ravines, where on small flats are found a few vicuñas or chinchillas, and halts to feed his tired animals. Some of these pasture-grounds or "portreros"—as they are called—are inhabited by Indians, who cultivate the ground, and are attentive to persons with droves of mules from Chili on their way to Peru.

A few cattle and sheep are raised, and the Indians lead streams of water over the veins of salt, which help to refresh and fatten their cattle.

In the ravines through which the tributaries of the Rio Loa flow towards the Pacific, some barley, maize, potatoes, and fruit-trees are produced by irrigation; wherever in the barren countries these Indians can get a little water, they are enabled to make a crop of something for use.

In former days, gold mines were worked in Atacama, on the Pacific side of the Cordilleras; silver, iron, and copper, of excellent quality, are found there also.

The guano along the coast was known and used for manuring land by the Incas before the discovery of the country by Europeans.

Bidding farewell to the Pacific side of the Andes, we enter the small

village of Challa for the night. The only conspicuous thing in sight was a large steeple, with a small church tacked on to the heel, built of mud and stone. The place looks miserable, yet the Indians appear cheerful, and of a lighter complexion. Some of them speak Quichua. José was told there are no more Aymara Indians to the east of us.

December 9, 1851.—At 7 a. m., we found a heavy frost on the ground. Thermometer, 41°; wet bulb, 36°. This observation is made on the very edge of the Madeira Plata. Water flows to the east of where we are standing.

The country round is thrown up into confused and rough shapes, uninhabited by man or beast. Great rocks stand clear and clean of soil. Not a living bush or green leaf to be seen, nor a bird in the air. The day is calm and warm.

The bright sun shines on the east side of the peaks, and in the shade, on the west side, there is frost. When the sun passes the meridian, the frost disappears until after night, when it is first seen on the east side. While the sun is on his trip to the south, and the rains are falling, the frost may be found deep down in the ravines and valleys; the traveller passes over it in the road, and it lays all day long on the tops of the Andes.

Descending a steep, winding road, we were surprised at the sudden appearance of flowers, patches of grain, Quichua Indians, and the most delightful air we ever breathed. Getting down from our mules, we followed them on foot. A comfortable temperature makes a man want to feel his legs again.

At midday, the thermometer stood at 66° in the shade. A small stream trickling over rocks, coated over with a green slime, had a temperature of 107°. One flowing into it, at a temperature of 70°, had an iron-red coating over the stones. The mingled waters of the two showed a temperature of 104°.

An Indian woman was washing clothes in the more than half boiling water. After rubbing them over a smooth stone, she wrenched the argentine soap off in the cooler stream, and had hung them up to dry in the tropical sun on a small bush, under the shade of which she sat composedly. Her petticoat was conspicuously a new one. As we attentively observed some distinct letters upon the stuff, which were "Lowell," she seemed somewhat surprised, and laughed as though she thought us very inquisitive to be so closely examining a woman's clothing. Her earrings were of gold; a silver cross was suspended by a guard of vicuña wool around her neck. The black wooden ring upon her finger was carved from the hardest and deepest colored wood that

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grows to the east of us. A doubled-up piece of coarse scarlet cloth lay on the top of her head to keep off the rays of the sun, being used at night to cover her shoulders, which are now bare. She envies our straw hats, and says it is mean not to give her one. She wears shoes and stockings only on Sundays, when she goes to church; the former of fine black leather, and the latter, silk. Her language is Quichua. When the wise Incas mastered the Aymara tribe they colonized the country to the east of them, sending the Quichuas through the Aymara territory to surround those who never would be taught a strange language, nor give up their own.

While José enjoys a short flirtation, we get out our map to find that this woman has been washing her garments at the source of the river Mamoré; she is dipping her fingers into the main head of the great Madeira river.

Descending the side of the warm stream, we met a drove of sixty spirited mules, with heavy loads upon their backs. They ran up the road, fretting and staggering under the weight; getting out of breath, they make a full stop, and then clamber up again.

We halted, and had a talk with the arrieros; they were from Cochabamba, bound to Arica, in Peru, with one hundred and eighty quintals of cinchona bark from the province of Yuracares. They make the trip to Arica in about twelve days over both ranges of mountains.

Calling loudly to their mules, they move slowly up hill. It was hard work for them to get to the South Pacific shore with their bark, while the Indian woman's soapsuds went dancing by us on the dashing stream towards the North Atlantic.

On gaining the base of the mountains, we rode into the pretty town of Tapacari. The lofty church steeples were just visible above the tops of the richly green willow trees. Peaches were half ripe in the gardens, and our tired mules anxiously called out for food as a donkey passed with a load of green lucerne just reaped by the Indians sickle. At 3 30 p. m., thermometer, 72°; wet bulb, 60°; cumulus clouds.

The people are so much whiter than those we have lately seen, that some of them appear very little like Indians. They are dressed in thin clothing. The women wear ruffles about their necks, and the lower parts of their dresses are fancifully worked by their own hands.

This is the land for chicha; the ravines seem to be flooded with it. People are dashing about on horseback, feasting and making merry near by. The postman, a most polite and attentive old fellow, attended to his business while taking his part in the frolic. He evidently had his share of chicha, which made him show loss of teeth when he laughed.

His wife, one of those who help to keep the world balanced, cooked us a very good dinner. She had seven pretty daughters, but as our fresh mules were loaded we pushed on.

The streets of the town are very narrow, paved and clean. The houses are small, and well filled with large families, who are so gay and look so happy, that we leave them with regret.

The ravine is narrow; in the middle of the dry bed of the river flows a small stream. Rain falls in great quantities in due season, and the sides of the hills are washed into deep gullies. The contrast between the barren dry hills and mountains, with the green, gay little valley, is very great. But what attracts our attention are the crowds of children; some are sleeping on their mother's backs, others hang lazily in front; they crawl about the doorways, and I stopped my mule for a naked little fellow paddling turtle fashion over the street.

The Indian men are fine looking; their forms are straight and well developed. The creoles are more numerous and frank in their manners. The effects of climate and provisions upon people are wonderful, and quite astonish the traveller.

We are in the department of Cochabamba, which has a population of 231,188 creoles, and 43,747 Quichua Indians. It will be observed that the proportion between the two races, when compared with the population of the departments above us on the Andes is reversed. The Spaniards have crossed over the mountains, east, to find here a more agreeable climate than in other parts of Bolivia, and delight in fruits and flowers.

In the province of Arque, a short distance to the southeast of us, there are three silver mines worked, and one hundred abandoned, besides several which have been left at the base of these mountains.

After a few claps of thunder among the heights to the north, heavy clouds doubled themselves up over head, and a pelting shower of hail stones, the size of peas, came down. The mules ran about with us as though we were beating them over their heads. The moment a little breeze rose, they turned their tails to it and stood with their noses close to the ground. The rain that accompanied the hail froze to our hat-covers and India rubber ponchos, while the hail rattled as it beat upon us. A hail stone which struck the top of my boot left a pain I felt for an hour after. Lightning flashed about in the very midst of us, while the loud thunder roared through the valleys like the noise from cannon of heavy calibre. Soon the sun shone out, the storm melted away, and all was clear again. It seemed like the winding up of a pleasant winter.

As night overtook us, our path, though level, was difficult to find

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among the sand and gravel of the river bed. Near some Indian huts, we hear them singing and playing upon a small guitar. We seldom heard singing on the mountains. José was ahead with the baggage, and, as the bright moon rose above the low hills before us, we discovered we had taken the wrong road. The Indians soon put us right; we were nearly fagged out with the day's work descending the Andes, but enjoyed the calm summer night. Our postillion's horn told us we had arrived at Zizque post-house.

At 8 a. m., thermometer, 70°; wet bulb, 61°. The difference between this temperature and that of yesterday morning at 7 a. m., on the mountains, is for the air 29°, and wet bulb 25°. Cool springs of fresh water rise along the edge of small green meadows; fine cattle feed under the shade of large willows trees. The postman keeps a good horse, and his house is surrounded by fig trees, loaded with fruit. By the side of a small stream snipe fly up. The doves and pigeons coo among the trees and bushes, while the turkey-buzzard soars over the tops of the small hills about us.

The road is narrow but level. On one hand we have the maize ready for the reaper; while, on the other, it is just peeping out of the ground; further on, in one field, the Indians are planting corn, and others are gathering their crop. Barley and wheat produce large heads and rich grains; beans seem to be favorites. Old hens run through the corn-patches with their families, while Spanish cocks square off before us in the road for a fight.

Under a grove of fig trees, which are large, were seated a party of merry Indian girls, sewing, spinning, and drinking chicha with their lovers.

On the 10th December, 1851, we rode into the beautiful city of Cochabamba, having a population of 30,396 people, situated close to the south side of a range of mountains, jutting out from the main trunk of the Andes, in latitude 17° S., and stretching off into the Madeira Plata, over two hundred miles in an east by south direction, separating this valley from that of Yungas.

As the newly appointed prefect was sick in bed with fever and ague, and his family not yet in their own house, we were obliged to seek quarters in the post-house. There was no hotel, and our letters of introduction were to the prefect. We had a horror of a post-house, not usually so habitable in a large city as it is on the road, and thought we had better go back into the country and pitch our tent under the fig trees. But the postillions and mules seemed tired, so we let them lead the way through well paved streets.

The houses are neatly painted, and some of them three stories in

height, with an air of respectability about the place we little expected to find. The streets crowded with people of all sorts and sizes, and nearly all seemed to be busy. The large plaza was decorated with fine old willow trees.

Gaining the post-house we found a miserable woman and child its only inmates. Our baggage was piled up in one corner of the room. The child raised a terrible dust in sweeping the room and driving out the chickens, who laid eggs in the corners, and roosted on the centre table. Our postillions bade us farewell, and our mules were put in a yard close by. The woman cooked some chupe of mutton and potatoes. We were tired, sunburnt, and not a little disgusted with our situation.

On a platform, built of adobe, we spread our blankets. After an unsuccessful attempt to get to sleep upon this bed of sun-dried bricks, I got up and struck a light that I might see some rude, uninvited inmates of the posta, who were making themselves too familiar with us, and found them to be chicken lice, ticks, bed bugs, and fleas. It was difficult to tell which species predominated. There was no rest for the weary that night. Richards rolled and tossed in his sleep as though his bricks were baking. I generally watch José for information upon points which he has had some experience with. Looking out upon the bright starlight night, I found the old man sleeping soundly in the stable yard at the feet of the mules. He had shaken his cold blankets in the cold air and rolled himself in them, where the insects would not go.

After a long time daylight came to my relief; with an application of cold water and a change of clothes, the horrible little man-teazers were gotten rid of.

After breakfast I walked through the city. The streets are laid off at right angles. On the south side of the main plaza stands a large cathedral, and opposite to it the palace occupies the whole side of the block. It is remarkable for its handsome appearance, being much superior to the palace in Lima. The ladies are also beautiful. In the centre of the plaza is a fountain fed by water from a snow peak on the ridge in sight. From the appearance of the houses and stores, there certainly must be wealth here for an inland town.

Strolling along looking at the people, I came to a corner where there was an unusually neat-looking store, and in the doorway stood an intelligent-looking gentleman, who seemed a stranger to this country. He was a German. The house belonged to a Frenchman, of whom I had heard. As soon as they found out I came to make an examination of the rivers, men were called to fetch our baggage and mules, and we were at once comfortably quartered. The French gentleman had been

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many years in Bolivia, was married to a Cochabambina, and surrounded by a beautiful young flock, who heartily laughed at our dislike to fleas.

The stream between the mountains and the town is a tributary of the Mamoré. It flows around the town, and after creeping along the ridge some distance to the southward and eastward, it passes round the mountains, and enters northward into the Madeira.

The President of Bolivia, with his cabinet, were here on a visit, and would leave shortly, under a large escort of regular troops. As there was not much time to lose, I immediately employed myself in the preparation of a commercial proposition to the government. A Brazilian minister had concluded a treaty of limits and navigation between his country and Peru. He was now awaiting the action of this government in Sucre, the capital, for the purpose of securing the use of the navigable rivers of Bolivia for the Brazils alone. I decided to ask the right and privilege to navigate the rivers flowing through the territory of Bolivia by steamboats or other vessels.

On Sunday morning, agreeably to appointment, two influential merchants of the city accompanied me to the palace.

The soldiers drilling in the plaza were young, spirited-looking, well-disciplined men, though small in stature. They were stout built, and nearly all half-breeds, except the officers, who were white. There was but one negro among them; he was the drummajor, and the largest man in the regiment. The officers lounged about the doors of the palace in full uniform, buttoned up to the throat, and looked as uncomfortable as the soldiers in their thick Sunday mustering clothes.

Entering a large patio, and ascending a stone stairway, we came to a balcony, where two officers in costly uniform rose and saluted. Entering a large hall, well carpeted and furnished at one end with curtains of the national color—red, yellow, and green—which hung over the sides of a large arm chair, in front of which was a small table, a tall, graceful officer of middle age rose from his seat in full uniform, a velvet cap embroidered with gold pulled down over his eyebrows. This gentleman was his Excellency Captain General Manuel Isidoro Belzu, President of the republic of Bolivia. After shaking hands and being offered a seat on the sofa, I said to him: "That the President of the United States, desiring a more active exchange of the productions between the two Americas, I had the hope that a more direct route between the United States and Bolivia might be found than by the way of Cape Horn." To which the President replied: "He had heard of my arrival in La Paz, and was pleased to see me. My country," said he, "is in its infancy. I would be the more pleased to join hands with

the United States, because we are all Americans. You may depend upon me for aid and assistance in your enterprise." Upon the entrance of some persons in uniform, we rose to take our leave. Before doing so, however, I was introduced to the Minister of War, who was an older looking soldier than the President himself.

Upon inquiring how the President came by some wounds in his face, I was told that in September, 1850, Belzu was invited to take a walk in the alameda of Sucre. A friend persuaded him to continue on outside the usual promenade, where they met some persons riding on horseback, upon the report of whose pistols Belzu fell, three balls having entered his head. The ruffians escaped from the country; the friend was shot in the plaza of the capitol before Belzu was well enough to interfere in his behalf. The plan was well laid, and so sure were the intended murderers that his days were ended, they rode off, leaving him on the ground, shouting "viva Ballivian," an ex-president, who at that time was known to be lingering along the boundary line between Bolivia and the Argentine republic.

This attempt to assassinate Belzu made him the more popular. The country is taught that his escape was Providential, and he had been spared for the good of the people.

As we recrossed the plaza one thousand horsemen were waiting orders. The horses small, but spirited, were in good order. The men, too, are larger and a more daring-looking set of fellows than those of the infantry we saw; each man wore a small scarlet cloak, and upon close examination I found every one of them had brass armor breast-plates; such as we read were worn by the ancients.

We visited the several ministers of the government, of whom there are three, according to the last constitution. Their families are with some of them, and government clerks travel about the country with the President. A part of the standing army marches in advance, and a part in the rear, as the administration winds along the narrow road through the Andes. The artillery does not travel, the roads being too narrow and rough for the cannon to pass on wheels. It may be taken from Oruro to Cuzco through the Titicaca basin, for there the country is level, and a railroad might be built without much expense for bridges or cutting through hills.

The arms used by this army are the old tower flint muskets, kept in bad order. The cavalry have a short carbine slung to the saddle, and carry a lance kept very bright and sharp, to which is attached a small swallow-tailed red flag. They manœuvre by the sound of the bugle; when in motion the noise made by enormous spurs and bridle-

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bits sounds not unlike that of a tin pedler's wagon. The horses are not well gaited, and some of the men bad riders; they all lean back, as though riding down hill all the time. There was not much discipline among the cavalry, unless smoking paper cigars and drinking chicha are regulations for cavalry drill. The women fancy the horsemen; crowds of them collect to look on. Some of them bring chicha, and with the most daring manner slip in between the horses a jug or light for a cigar. The population of Cochabamba is composed of about one man to five women, or more when the government comes. There are an unusual number of weddings, for the beauties of Cochabamba are thought to surpass those of other towns in the country.

The public force of Bolivia is composed of a standing army, an organized national guard, or militia, and a police. The standing army consists of three thousand men, with one officer to every six soldiers. Indians are not enlisted, they being considered the agriculturists of the country.

Bolivia has a population of about one million five hundred thousand; more than one-half are Indians, so that there is one soldier in the standing army for less than every two hundred and fifty creoles. The cost of maintaining this army is not less than one million of dollars per annum, drawn from the labor of the aborigines. This is a heavy tax, when we consider that the value of the exports, exclusive of silver and gold, are not over five hundred thousand dollars a year.

The organized militia, about twenty thousand strong, are ready to defend their country, and when called out, fight bravely. Those who are natives of the Andes have an advantage over the soldiers of the lower countries, in being able to exert themselves in a then natural atmosphere. When men who live in the lowlands travel to the height of fifteen thousand feet above sea level, they give out for want of breath, and lay harmless upon the ground, while the Bolivian soldier smokes his paper cigar with comfort, and laughs at the imprudence of his enemy.

We visited the family of a countryman, the widow and two handsome children of a gentleman very much respected by the people of this country. His son, a fine looking little fellow of ten years of age, had the manners of a Spaniard, and spoke his mother's language; but the quick flash of his black eye, and his desire to join our expedition, plainly bespoke his relationship to Uncle Sam. His sister, the elder of the two, promises to be the beauty of Cochabamba.

At daylight in the morning we passed the river Mamoré; it is called here Rio Grande. The Indians waded across knee-deep. The width of

the bed of the river was about one hundred and fifty yards, with bottom of stones and gravel. The water is drawn off at this season of the year for irrigating the beautiful gardens of Calacala, opposite the city, and close under the mountains. As the sun rose we met Indians going to market with the vegetables of Calacala. The ride on horseback through roads shaded by willows is delightful at this hour of the morning. My companion's horses were the finest in gait and action I saw in South America. The Indians were reaping lucerne to load their donkeys. The jackasses are large; attention is paid to the breeding of them with an eye to size. They are more required by farmers than mules or horses. Oxen are used for ploughing, and donkeys for marketing.

Flowers are in full bloom; strawberries are nearly ripe. Christmas is not far off; peach, orange, and fig-trees are loaded with fruit. This is the time of the morning to count the weddings, as the parties pass us on horseback.

The Indians cultivate with a hoe; they work the ground very carefully and neatly, manuring and keeping the plants of the strawberries clear of weeds. The patches of onions, cabbages, and maize are very fine. In a peach orchard we see a grape-vine overrunning a tree, and loaded with fruit. There was a time when fifteen thousand bottles of wine per annum were made at one hacienda, near the base of this ridge to the southeast, but its manufactory has been abandoned in favor of chicha.

As we turn back we hear thunder to the east, and a heavy black cloud covers up the bright morning sun. Before us in the road was a loaded jackass, slowly walking before an Indian woman with a heavy weight on her back, while she carried a sucking child in her arms; behind her a poor old blind horse bore two stout, well-built, lazy-looking mestizos, with more Indian than Spanish in their composition. Their long legs hung down so straight that they looked like natural appurtenances of the animal they rode. Around their shoulders they each had wrapped a comfortable poncho.

After spending some time at a hacienda we reached the river again on our return, and were surprised to find the stream swollen so much that the Indians could not cross with their loads. Close by us were a number of creoles on horseback discussing the chances for horsemen to cross. One man, mounted upon a tall horse, risked it; entering the stream, he waded, turning the horse's head diagonally up stream, and passed safely.

I was delighted when I saw our two lazy companions kicking their heels into the sides of their little blind pony, and urging it where the

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horse evidently had sense enough to know he should not venture. However, the riders had their way, but steered down stream instead of up. When they got into the deepest, the rushing waters rose on the horse's quarter, and the animal went down stern first, carrying ponchos and company under. When their heads appeared above water, the shouts of laughter from not less than one hundred Indians, made the valley ring. The men were so frightened they clung to the horse as soon as he could get up to breathe, and down they all went again. Finally, they aided each other, and so found their way back, leaving the horse to take care of himself. In two hours the water ran off, and we crossed without a ducking.

The valley of Cochabamba supplies many parts of Bolivia with flour; wheat, maize, and barley are transported to the miners of Potosi and Oruro, and to the coffee or chocolate planters of Yungas. This has been called the granary of Bolivia; although it is at the base of the Andes, yet it is higher than the garden of Yungas. Following the course of the Mamoré, from Tapacari into the bottom of the Madeira Plate, the descent is long and gradual.

The apple, the pear, and the quince, are produced in the valley of Cochabamba; coffee and chocolate in Yungas. These are not plants that flourish by the side of each other. Yungas is thickly wooded. Here the hills and some of the plains are too dry to produce any vegetation without the help of man.

The winds seem to draw up into the Yungas valley more than here, while the crops suffer for the want of rain, and the heavens over Cochabamba are perfectly clear. We have seen heavy clouds driven along the northern side of the range, and heavy rains pouring down just on the edge of the ridge, far enough on the south side to flood the tributaries of the river which flow past the city. The clouds come in contact with the Andes' sides, and seem to be turned and twisted up, so that sheets of water fall to the earth, and produce a growth of forest trees. The winds drive well up into Yungas, loaded with moisture, and meeting the great Illimani and Sorata, form an immense quantity of snow and ice.

The moisture of this valley is carried up through the ravines of Tapacari, and strike the table-lands on the Andes, where we met the cedar bushes.

The rainy period fluctuates in some seasons a month. At Cochabamba it usually commences about the first week in December, but sometimes there are few showers until the first part of January; yet it seems, from our observations, that the heavy rains have set in in sight of

the city; while here, the 15th of December, it has not commenced to rain.

In the garden of the minister of haciendas, we were shown the morus multicaulis, which had been lately imported. In comparison with those we have seen growing in North America, they appeared to be in a congenial climate and soil. The minister was fond of gardening, and was at work early in the morning, giving the Indians instructions before he went to a cabinet meeting. While the husband travelled about with the government, his wife remained at home raising silk. She appeared with a basket of cocoons. Most of the cabinet families were from Sucre. The ladies of that city are celebrated through the country for elegant manners. It is impossible to resist the temptation to notice the beauty of the fair sex in this part of the country.

Lemons, limes, and oranges are raised in Calacala, but not in perfection; pumpkins and peppers seem to flourish better. Seven cuttings of lucerne are made here in the year. The cattle and horses are kept in fine order upon it. Donkeys are fastened by a fore-foot to a stake driven in the ground; cattle are tied by the horns and fed. They are seldom turned out in the field to pasture. The Indians plant a row of quinua round maize, sweet potatoes, or other patches. The animals will not eat it, and are even afraid to touch it. This is the only fence we have seen in the country, except those built of adobe, which are generally so high that the view of the garden is entirely obstructed from the road. The quinua plant grows from four to six feet high, and looks like a coarse weed. The grain is small, like turnip seed, and very nutritious. It is an important crop in this country, particularly on the table-lands. When boiled like rice, and eaten with milk, it is very savory.

The flowers raised in the gardens are generally those imported from other countries; the tube rose and others are cultivated in perfection. There are no pretty flowers indigenous to this part of the country, except the Indian girls.

The alameda is frequented in the evening; there are plenty of seats, but for the want of water the plants and walks are in disorder. The level walk is about eight hundred yards long from a large brick arched entrance to the bank of the river. The arches were decorated with representations of battles and great men. We noticed a white figure very much besmeared with mud thrown at it. Over the head of the figure, letters carved in stone expressed the name of BALIVIAN. He had been thus pelted by the soldiers of his successor, each man as he passed showing his love of country by flinging a handful of mud at the image of the late President.

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The legislative power is vested in a Congress composed of two houses—one of representatives; the other of senators—all elected by the people for the term of four years. There is one senator for the department of Litoral; three for each of the larger departments; one for the Beni, and two for Tarija—twenty-two senators at present. No man can be elected a senator who has less than a thousand dollars a year income, or who has suffered imprisonment by law. The value placed upon a representative is fifteen hundred dollars income.

By the last constitution, Congress is directed to meet at the capital every two years, on the 6th of August, and to remain in session seventy days.

The President has the power to change the place of meeting at regular or extra sessions to any part of the country, when in his opinion there is danger from internal or external wars.

One representative is elected by thirty thousand creoles, and one for the fraction of twenty thousand, counted by departments, whose governors or prefects are appointed by the President.

A President is elected for the term of five years, and cannot be re-elected until another term of five years has expired. We believe there never has been an election of President by the people. The last President came into office by overthrowing the government.

The power of the government of Bolivia rests upon its armed force. The voting population is thinly scattered over an extensive country, and the army is large. Intelligent people of this country much dislike the mother country—Spain. They blame her rulers for the manner in which the creole portion of South America were treated while she held the country. To keep them ignorant and get their silver was the sole policy of that government.

I was surprised to be invited to the house of a family in great distress. The husband and father was thought to be dying. Without understanding why I was asked, I went. The house was situated on the corner of a street opposite to a church. It was crowded with ladies and gentlemen. The patio was filled with frame-work, made of reed, some ten feet high, to which fire-works were fastened. The street in front was crowded, and the centre of it carpeted the length of the house. The ladies on the balconies, as far as we could see along the street, were dressed in white, and had gathered quantities of flowers in baskets. The gentlemen were dressed in deep black, as if going to church. We were introduced to the lady of the house, who seemed to be greatly distressed, but was engaged paying attention to the people like at a ball. Her daughters were dressed with flowers, and with so much care as to

lead us astray. The father was evidently dying in the next room, the doctors being said to have given him up.

The sound of music drew us all to the balconies to see a grand procession. A large wooden image of a female was carried on a platform; a company of regular soldiers followed with music; then came priests and attendants, with lighted candles, and a long train of young padres, all under a shower of flowers from the balcony. When the wooden image appeared opposite the house, the men under the front part of the platform let her down on the carpet; the priests knelt by her side. The bells of the city churches struck, and the population took off their hats and knelt in prayer for the dying man. After singing a hymn they marched away to the music. The carpets were removed from the street, and, as night came on, the fire works commenced. Wires leading from the sick man's bed-room to the altar of the church, carried messengers of fire backwards and forwards, while brilliant fire works attached to the great frames were set off along the street. The noise made about the poor man was deafening. The crowd of people returned home, stopping on their way for ice-cream sold in little shops alongside of the plaza. In a few days after the doctors reported the sick man out of danger. The cost of these proceedings was two hundred dollars.

The climate of Cochabamba is very apt to deceive persons from the Andes. The people here are very careful about their dress, and never expose themselves by drinking water or sitting in a draft of wind when heated; severe colds taken in this way, with sore throats, frequently cause death.

We observe the same phenomenon as in the Titicaca basin. A vertical sun shines upon the valley, and at mid-day its effects are very powerful; while all around, on the tops of the highlands, hang curtains of clouds reaching half way down the mountains. The air underneath and on the snow, near the city, becomes very cold, and suddenly a puff of wind comes down, bringing along the clouds, and the population are shivering. In an instant they clap on their woollen ponchos and close their doors.

We have had processions through the streets for some days. Padres, with bands of music and wooden images, praying for rain, as the crops are suffering in some parts of the valley. Numbers of Indians join as they pass along. The praying continued till rain fell, and then the Indians believed the priests had the power of persuading the Almighty to send them relief.

We met the bishop of Cochabamba in society. He inquired anxiously whether "the people of the United States wanted to navigate the rivers

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of Bolivia?" He was told that "they desired to trade with the Bolivians." After he left, a lady said he was opposed to the opening of the navigable streams of the country to the commerce of the United States, and had informed the people that it would be the cause of declaring religious liberty.

The cabinet ministers returned visits, and expressed themselves highly in favor of the enterprise. The minister of state said my proposition should be attended to as soon as they arrived at the capital, and he should be pleased to hear from me, should I wish to address him on the subject.

The President enclosed a short note to the principal families in the city, saying he regretted his public duties kept him so much confined that he had not time to call upon them, but if they had any orders for Potosi or Sucre, he would be happy to attend to them.

The government troops were drawn up in the plaza on Sunday, December 21, 1851, and after being inspected, the cavalry was ordered off in advance of the president, who has appointed Monday morning for his own departure.

A fine-looking man, who had been colonel under Balivian, and left the country when Belzu came into power, had recently returned to Cochabamba. As he took no particular or active part in politics, and was successfully farming in the valley, his friends persuaded him to go and pay his respects to the President before he left. So he walked in with some other persons. As he dined with us after his visit, we offer the account he gave of it to a number of gentlemen, with the spirit and merriment of a good actor on the stage. "I have come, sir," said the colonel, bowing, "to pay my respects to the President of Bolivia." Belzu in a rage. "You are the scoundrel who raised volunteers and fought against me!" Colonel bowing again respectfully: "Yes, sir; and in doing so I did what every officer is expected to do—obeyed the authorities of my country." Belzu in greater rage. "Get out of my sight, sir; if ever I hear of your taking part against me again, you will be shot in the centre of the plaza." The Bolivians all laughed, and like himself seemed to think it a very amusing visit. I noticed closely the effect produced upon the faces of the party as they listened; not one of them looked grave. They seemed to listen as though they expected some joke of the sort, or with admiration of a noble-looking fellow for daring to speak out so freely of what had taken place. He left us after dinner, and in the evening we saw him standing in the plaza telling a number of his friends the same story. Many leading men who belonged to the Balivian party kept very close while the President remained here. The election of president is a fighting affair usually.

At fifteen minutes past twelve, at midnight, we had one heavy shock of an earthquake. I heard the door shake and my bed move as though some person had taken hold of one of the posts and given it a violent jerk. The people in the next room hurried out, and the whole population was up in a moment. The scraping of matches and grasping of candles was terrible. The dogs howled in the most mournful way all over the city; horses rushed round the corral as though frightened half to death. The atmosphere was filled with a strong odor of sulphur. The night was clear and starlight, the thermometer standing at 72°. The population trembled in silence expecting the great Andes would again shake; but the night continued calm.

Throughout our route we have observed a great work of displacement going on. The earth seems to be fashioning itself into shape. The mountains are being carried off to the lowlands by the floods, and the dry lands seem to be growing at the expense of the sea.

In the morning we mounted our horses, and a number of persons prepared to accompany the President entered the street. We were told he had long since gone with the whole army at 4 o'clock.

Many of the Indian girls and boys have followed the army. Families find great difficulty in keeping servants from going off. It is amusing to see troops of women following after the cavalry, sometimes three on one horse, or two on a donkey, with kitchen utensils and bedroom furniture, serving in the place of riding gear, but without any idea that they are going to the frozen peaks of Potosi.

There are a few foreigners in Cochabamba—English, French, German, and Scotch; some of them engaged in mining. All expect to make fortunes very soon; but say they have been thirty and forty years in the country, and are poorer now than when they came. A hard-working, cheerful, honest Scotchman, who had been a number of years in a woollen factory in New York, told me the most unfortunate thing he ever did was to leave the United States.

The wages paid the Indians for mining silver varies according to the value and hardness of the veins—from twelve to sixty dollars the yard. The mines containing water are cleared by the means of llama skin buckets, passed from hand to hand. This required a number of Indians, working day and night. If a man could not make his fortune with a corn-shelling machine in this country, he would very much astonish the natives by the use of such a convenient implement.

The merchants of Cochabamba send off every week a supply of goods to the valley of Clisa, a short distance to the southeast of this city. The Indians from the surrounding country come in on Sunday to buy

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at what is called the weekly fair. Six hundred dollars worth of chicha have been sold in a day at these fairs. A foreigner once had this liquor prepared by pounding the corn between stones, and offered it to some of the country ladies to drink. An old chicha toper, after tasting it, said, "for her part, she much preferred chicha made of chewed corn, which gave it a different flavor from that made by the stones, and she was fond of good chicha."

The merchants make their remittances to the sea-coast by putting twenty-two hundred dollars in silver in bags well covered with leather, forty-four hundred dollars being a mule load. The arriero signs the bill of lading and arms himself for the robbers. Sixteen dollars per mule load is paid for delivering it at Tacna, in Peru, near Arica. The trip is made in fourteen days. It is strange that these trains are seldom robbed among the uninhabited regions of the Andes and Cordilleras, where the arriero sleeps upon the mountain-top or in the deep gorge by himself.

The trip from Cochabamba to Cobija is made in forty days. The distance is two hundred and nineteen leagues.

Since 1830, the government have thought it policy to debase their coins about twenty-six per cent. worse than ordinary dollar standard; sometimes they have exceeded this standard. Their doubloons of 1827 to 1836 contain eight hundred and seventy parts of fine gold in one thousand. The dollars and portions from 1827 to 1840 are from six hundred and seventy to nine hundred and three fine in the one thousand, showing very great irregularities.

The consumption of their cotton cloths and silks increases as we move east, and where the climate is warmer. The Indian girls are seamstresses here, and are very handy workers with the needle. Wine, rum, and dried fish are imported from Peru, for which wheat, maize, and soap are given in exchange, making up the balance of trade with Peru in silver.

The inland situation of these people places them so far from the markets of other countries, that they are obliged to supply their own wants very much, and we find various descriptions of industry. Weavers produce beautiful cotton and woollen cloths; hatters form hats of the vicuña wool equal to well-taught workmen. We found them much more comfortable than our own. The women cut out and make dresses, and tailors abound. Blacksmiths are in greater numbers, and carpenters' shops, a rare establishment on the mountains, indicate our close proximity to the forests. Cabinet-makers supply the city with much furniture, although the deficiency is still apparent. We have seen a train of jackasses entering the city loaded with cane-bottomed chairs manufactured in the United States, and another train loaded with iron bedsteads from France, while the shops are well supplied with ornamental woods. The difficulty in producing is from a want of a proper teaching of the trades. A boy handles a North American chisel very awkwardly, while the head of the shop stands in the doorway smoking a paper cigar, with a broadcloth coat on his back, and a poncho over that.

While the President was in Cochabamba, a young man was presented to him, who it was said "invented" a piano. He was highly praised, and his piano valued as a home production. The tin men are good workers after their own fashion, but they seem indisposed to be employed out of their usual routine. We wanted a funnel, one inch perpendicular at the mouth, for the purpose of catching rain, and measuring the quantity of water during the rainy season. The most experienced tinner in town looked at the drawing and measurements, but handing it back, said, "I never work my tin up in that shape;" though he willingly made us a common funnel; there appeared no disposition to be uncivil or disobliging, but a very strong indisposition to exert the brain. We see few men saving their hands' labor by practising head-work.

The tin is found in the Titicaca basin, carried over the Cordilleras, and shipped around Cape Horn to the United States; manufactured, then re-shipped, and after doubling Cape Horn a second time, returns by the mouth of the mine, crosses the Andes, and is sold here to make tin pans, funnels, and coffee pots for the original miners.

There are few jewellers in the city; now and then a travelling German sets up shop, and does a good business for a while. The bishops and priests carry their timepieces, and visit him before breakfast. Many persons having business with the church, go to the jewellers to settle; then they have an opportunity of seeing clocks and watches that excite a penchant for antiquities.

The gunsmiths are tolerably good. There are more old pieces in their shops than new ones. It is doubtful if a Cochabambino ever "invented" a gun, but they repair stocks and barrels to satisfaction, and charge double prices.

Indian women purchase of the merchants cotton goods, needles, thread, beads, scissors, brass or silver thimbles, and small looking glasses, which they retail in the plaza under the willow trees and along the shady sides of the streets, working at their needles, or spinning wool and cotton by hand, during any leisure; others sell shoes. The fruit huxters are invariably the fattest, and the dry goods sellers the best looking, and always dressed surprisingly neat. The girls from Calacala, who bring potatoes and quinua, have a more country air.

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CHAPTER VI.

Market place—Cinchona bank—Funeral ceremonies—Longevity—Kindness of British and Brazilian ministers—French schoolmistresses—Ancient habitation—Sucre, the capital—Departments of Chuquisaca and Tarija—River Bermejo—Distribution of vegetable life—Visit to Lake Uarauara—Snow line—Balls—Theatre—Department of Santa Cruz—Creole population—Daily life—Province of Chiquitos—Indians—Labors of the Jesuits—Paraguay river.

On the regular days the market place is crowded with Indians selling, while creoles are the principal buyers. The market is conveniently arranged; on one side are the dry-goods huxters; on another, those with shoes and beads. Beef, mutton, and pork are kept by themselves, while fruits occupy a separate part. In the centre a number of women cook chupe for those who are from home. In the street stand droves of jackasses patiently waiting with forefeet hobbled. Children sleep while slung to their mothers' backs. The gay laugh of the Indian girls often makes the country boys sputter their chupe. Small bundles of wood and charcoal are brought from the further side of the ridge. Indians leave town with the setting sun and return during the night, driving donkeys loaded with snow to be sold to the ice-cream facturers. These various businesses are on a small scale, but all contribute their mite, and the market of Cochabamba is well supplied with everything the inhabitants need. The candle-makers do a good business. Oil costs so much after the transit across the mountains that it is seldom used. We were present when a merchant unpacked some boxes of French wines and sweet oil. Every fourth bottle was broken, and some bottles empty. This loss was deducted from the pay of the arriero. The poor man looked sad at the smallness of his receipts after fourteen days labor over the mountains from the coast. French articles excite the fancy of the people very much, such as work-boxes, cigar cases, fancy lace. The women sometimes buy, for the sake of getting the pretty paper boxes the French put their goods in. Very common glassware sells well, but costly articles are more or less injured by the journey, and find few purchasers here. The people are more fond of trade than any other employment; they seem to take pleasure in buying and selling again, and to possess an active industry seldom met with.

The great business house in Cochabamba is the bank for the deposit and purchase of cinchona bark, gathered along the northeast side of a

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By Lieut L. Gibbon U.S.N.

COCHABAMBA MARKET WOMAN.

Lith. of P.S. Duval & C°. Phil.

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ridge in the province of Yuracares. This bark was first gathered in quantities in 1849, though known for many years. The best quality is not quite equal to that of Yungas, but only second to it. There are four other classes of inferior bark, for some of which the bank pays fifteen dollars per quintal. The best, by law, is worth fifty-four dollars. The freight to Arica is seventeen dollars the mule load of three quintals. Six thousand quintals of bark have already been gathered from Yuracares. The bank was established in the year 1851. Mr. Haenke mentioned the existence of cinchona bark on his visit to Yuracares in 1796, but it was never closely examined until 1850, when it was found to be of such good quality that the people of Cochabamba endeavored to get a bank established upon an improved plan. This was not agreeable to those at La Paz, and when the Yuracares bark was sent to that bank to have its value determined, it was pronounced bad. The judges of Tacna, Lima, and Valparaiso gave a different opinion. A shrewd business man of Cochabamba requested his agent in La Paz to forward a quintal of Yungas bark that had already passed inspection as good bark through their bank. It was then made up in the Cochabamba fashion, and bearing a Yuracares mark, was sent back to the La Paz bank. In regular course it was pronounced bad. The case was then laid before the government; a new company was formed, and a bank was established here, but without the proposed improvements.

The eighth article of the last constitution declares, "All men may enter the territory of Bolivia, live in it, and are at liberty to take away with them their property, paying duties to the treasury, according to laws of police and the custom-house."

The forests are open to all who choose to enter them; the business is more valuable than mining. Men sometimes remain after the rainy season has commenced. We have dreadful accounts of the loss of life among the woodsmen this month (December) by the sickness brought on by exposure to the climate. Many poor families are without husbands and fathers. They have died in the woods, while seeking fortunes.

The Indians comparatively pay little attention to the business. They make use of cinchona, as well as of other barks, but seldom trade with it. There is a bark from the province of Matto Grosso, in Brazil, which the Indians prefer in cases of fever and ague. It is from a large tree with very small leaves, violet blossoms, and the bark very hard. They boil it in water till the decoction becomes deep red, and then drink it. It is said by them to be a certain cure, although this bark is not yet known in the trade. The bank is obliged to keep watchmen along the roads to the entrances of the forests during the time the government

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prohibits the gathering of bark, to see there is no smuggling. This plan is both difficult and expensive. From Yungas the woodsmen sometimes find their way into Peru by secret paths through the tangled forests, and exchange bark under the shade of trees in the Amazon basin for the gold of Carabaya. It is astonishing to see the toil and labor these poor men go through under tropical sun and rains for this article of trade; yet neither they nor those having the monopoly appear to be accumulating money. The expenses of labor, the distance from market, and the want of system in the business appear to be obstructions. The law requires the woodsman to sell his bark to the bank; the company again are required by the same law to pay fixed prices per quintal. The market prices in the northern countries are so low that the bank is occasionally obliged to stop. The woodsmen crowd in and require money for their bark; the business becomes choked, and the people engaged are dissatisfied. Then the government is called upon for temporary relief for money to pay the woodsmen, or a decree to prohibit the gathering of bark until the market prices rise.

While in Cochabamba we witnessed ceremonials for the funeral of a little child. A number of ladies came to prepare the infant for the grave. They dressed it in a white silk frock, fastened on by diamond rings, and trimmed with gold and silver threads; the little feet and head bare. In its right hand was placed a golden cross, and in the left a small silver lamb. The coffin was lined with deep-blue silk, inside of which was placed a little bed; the whole hung by three bands of blue and white ribbon. While the ladies were engaged upon this preparation, they laughed and talked as though making very different preparations. The mother and family were brought in to see the arrangements. Six little boys, dressed in black, held the ribbons, and carried the child towards the church. The ladies, headed by the commadre (godmother) of the dead infant, followed, and after them friends on foot. The eldest sister was the only one of the family who followed to the church. As the boys moved along through the streets, Indian women crowded round to look at and admire the finery. The boys were cautioned to see that none of the jewellery were stolen. These are taken off after the body leaves the church for the graveyard, where the coffin is placed on a shelf in a brick wall above ground. Great care is taken that the coffin is not stolen, particularly when it is an expensive one. The same coffin is sold several times for eight dollars. Among the mestizos we are told are found many bad people. Twenty priests, with lighted candles, knelt in prayer by the music of "misa de las Angelas"—angels' mass. The ladies returned to the house of the mother, and spent the

evening sociably, as though nothing had happened. The regular custom of the country is to have music and dancing in the house before the corpse is taken to the church, and even to bring in chicha; but as the father of this child was a foreigner, no such practice was permitted. The doctrine taught by the church seems to be, that as the child is in Heaven, it is cause for rejoicing and merry-making. This appears to be a bounty for negligence and inattention to life.

I saw a funeral passing through the streets of Cochabamba, preceded by a man with a five-gallon jar of chicha on his head. At the corners of the streets, when those who carried the corpse were tired, they all drank and sang, until the whole party became intoxicated, so that they did not reach the graveyard at all, and the funeral was postponed until the next day, when the same forms were practised we saw the day before.

This is the case only among the mestizos; the Indians are more orderly; show a more quiet respect, natural, and proper feeling. They often sit silently in rows by a corpse all night mourning for the loss of a fellow Indian. There is among them a deep, heartfelt expression, that carries with it outwardly an unmistakeable and truthful inward grief.

The funeral of a wealthy creole is attended by gentlemen dressed in black, invited by printed cards, who carry long tallow candles through the streets, accompanied by music. A train of Franciscan friars and portable altars put up at the corners between the houses and some church. Masses are said agreeably to order, and a charge is made in the funeral bills for chicha, cigars, coca, wine, cooking apparatus, with other church expenses, amounting to nearly three hundred dollars. We witnessed such a bill paid for a friend, and could not avoid making a comparison between the articles and the list of mess stores drawn up by an old sailor on the eve of his departure for a cruise round Cape Horn.

Men do not live to a very old age in Cochabamba, eighty years being the oldest known at present. Girls sometimes bear children at the age of thirteen; twelve years is the marriageable age, both for creoles and Indians. The proportion of marriages in this country is small for the amount of population. I regret to be obliged to say the most moral portion is found among the aboriginal race. The Indian, with his wife and children around him, cultivates the soil, while the creoles and mestizos are idle and generally unmarried people. Since the establishment of the government, in the year 1826 to the year 1851, during twenty-five years, the population has increased from about one million to one million and a half. Few people leave the country, and few emigrate to it.

In the streets of Cochabamba there are many beggars, blind and

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crazy. It was the practice of one friend to open his door and let into the patio on Saturday about fifty miserable-looking creatures—men, women, and children—not one of them Indians; each was served with two loaves of bread by the hands of his little daughters.

Through the polite interposition of her Britannic Majesty's minister in Sucre, the Brazilian envoy kindly sent me passports to the authorities on my route, and also wrote to the governor of the province of Matto Grosso in my behalf.

The Extraordinary Minister Plenipotentiary from Brazil had made a short speech to the President and his cabinet, at a dinner in Sucre, on the navigation of the Amazon river and its tributaries, by which it was understood he had been sent to desire the exclusive right to navigate the branches of the Madeira flowing through the territory of Bolivia. An enterprising and intelligent gentleman, engaged in the trade of cinchona bark in Cochabamba, and a friend of President Belzu, answered the Brazilian minister. He said it would be more advantageous to Bolivia to grant that privilege to a company belonging to a nation who would introduce the mechanic arts, machinery, and agricultural implements, into the lowlands and proper tools for mining operations. He was in favor of the navigation being opened to the commercial people of North America. To this the Brazilian minister replied, that the North Americans had already annexed a large territory from Mexico, and he considered such a proposition an invitation for them to come to South America. As he had not been received in an official character by the government of Bolivia, he demanded his passport, and retired from the contest.

In the opinion of some, it was thought a wise plan to induce the President of Bolivia to declare towns on the branches of the Madeira free ports of entry to the commerce of the world. By others it was considered an impolitic movement, as there might be proved a necessity to land cargoes in the territory of Brazil at certain points of obstruction between the Atlantic and Bolivia, and no affront should be offered the Brazilian government, with whom it was necessary to be upon good terms for the accomplishment of a great commercial enterprise. The merchants of Cochabamba used their influence with the cabinet ministers to discourage any act which might stand in the way of a right to pass down to the ocean through the territory of Brazil, or, in case of natural obstructions—such as falls and rapids—to prevent an amicable arrangement for portages on land between these two nations.

The President has appointed two French ladies schoolmistresses for the public schools supported by the government for the education of

the poor children in Cochabamba. These ladies come from the other side of the world to teach, and by our particular request one of them promised to lead the ideas of the children along the current of the small stream flowing by the school-house through all its turnings, until she got them to understand how easy it would be to go that way to the land of her forefathers.

A large congregation of the intelligent people of Cochabamba were present at the opening of this institution. The prefect of the department and bishop appeared in their official robes. The gentlemen present were of many colors.

The ladies of Cochabamba very seldom smoke or use tobacco, except as snuff, and then it seems to be for the pleasure of sneezing; a practice frequently resorted to by the bishop, who wore a handsome diamond ring.

The prefect addressed the audience, and gave his authority for opening the institution. One of the French ladies rose and read, in a clear and intelligible voice, thanks to the government for her appointment, promising to exert herself to the best of her ability, setting forth the wide difference between the well-educated lady and the savage woman.

There are three schools in the city for boys, and two other small ones for girls. The great difficulty seems to be in the selection of teachers. While the government was here the boys had holiday, the troops being quartered in the school-houses.

There was no public journal published in Cochabamba on our arrival; but a Ramage press was soon set in motion upon the subject of the navigable rivers and commerce of Bolivia. A pamphlet was published, called "Revista"; we received the first number, and found that the young merchants of the city had contributed *poetry*.

The "Revista" is the fourth public journal in the country. Besides two small papers in La Paz, there is one published in Sucre—"El Eco de la Opinion," which with the rest are all careful to be of the same opinion as the government upon public as well as private matters. Indeed, we perceive no freedom of expression, as we would consider it in the United States.

The Indians' houses are small and generally have but one room. In the centre is a high adobe stand, built up to obstruct a view from the street. In one corner is an adobe bedstead, which is used for a seat. Around the earthy wall is hung a strip of cotton cloth to protect visiters' clothes from being soiled. In a small wooden box all the valuables are kept, such as clothes, money, and ornaments. On the wall are hung a few pictures of saints and angels, purchased from the clergy, with here

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and there a wooden cross, decorated with flowers. In one corner are earthen and copper pots or kettles, with a few large stones, between which the fire is made. In another corner is usually found a squadron of white, black, or yellow Guinea pigs, grunting and burrowing in the ground floor to the great amusement of the aboriginal children, who are very partial to them when converted into chupe.

The ancient habitations of the Indians of this valley are rotund, built entirely of moistened clay and stone, with but one entrance. These houses are going out of fashion, though many of them are used at the present day. There are a number of ruins about the valley, supposed to be of the style of ancient times. The art of building archways was an accomplishment of the Aymara tribe, of which we found no signs near the Inca capital.

The Indian ploughs a strait furrow with a team of oxen, although he knew nothing of such animals until the Spaniard came. He rides a young, unbroken horse bare-backed, sticking so close to the hide that his legs chafe the hair off; yet his forefathers had not a donkey to practise upon. The Indian is desirous that his children shall be taught. A fine-looking old man wanted to know if I would have his son to bring up, informing me of his good qualities, and saying that José had told him I was the sort of man to whom he should give his child. He evidently was not pleased at my declining his offer, notwithstanding José explained to him that my home was far off to the north; to which he replied, "No importa;" that was no objection.

A number of lakes are in the valley and on the mountains in the neighborhood of this city. During a dry time, no frogs are heard; but the moment the thunder roars, or the lightning flashes, they sing songs of thankfulness; the valley is made gay with their voices after rains. The wild ducks bathe in the calm waters, near the willow trees which shade the Indian's hut, and is also adorned with sweet orange blossoms, while the dry barren hills are baked into crust, and the sheared sheep look half starved for want of pasture.

The clover or lucerne that fattens horses, mules, horned cattle, and jackasses, is not relished by the sheep and llama. The latter animal is seldom found here, and unless forced down, never seeks the climate or grasses of this valley. The horse as well as black cattle thrive, and the hog is at his ease. There are few bees; we observe ants on clear days providing against wet weather; they are very exclusive. Humming birds are numerous; blackbirds, and three or four kinds resembling the cedar bird and sparrow, are seen. An ugly and very ill-natured hawk resides on the sides of the hills among the cactus and the doves.

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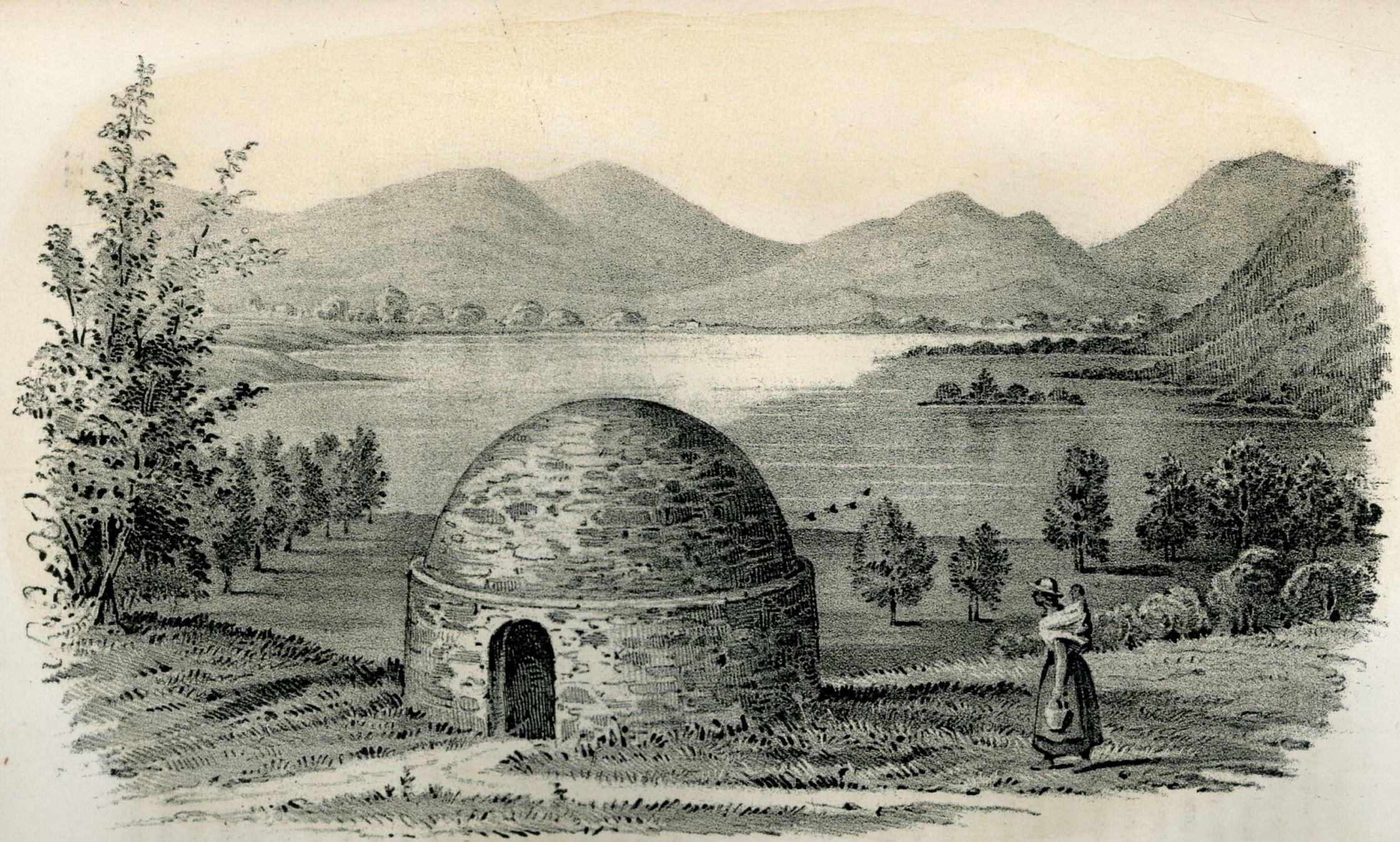

By Lieut L Gibbon U.S.N.

Lith. of P.S.Duval & Co. Phil.a

ANCIENT QUICHUA INDIAN HUT, COCHABAMBA. Bolivia

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We mounted our mules, which were saddled and fastened under a lemon tree, early in the morning. After passing through the rich gardens of Calacala, we wound our way through small bushes and cactus to the hacienda "Miraflores," where the people go in the month of January every year to eat strawberries and cream. As we rode up to the house an old Indian's head appeared on the one side of a pea-patch in full flower, as the sun peeped through a gorge in the mountains on the other. We were admiring the rich growth of vegetation at the base of the great mountain range, where green fields of barley appear at the mouth of a deep ravine, when we suddenly heard a crash, and looking round, saw Richards with mule, saddle, and gear falling over the rocky ground, for there was no road, and we had to take it rough and tumble; fortunately there was nothing broken except the saddle-girth and the stock of a gun, which the old Indian kindly enough assisted us in repairing, and sent his little boy to show us a path leading up the mountain side, dry and unproductive for some distance. Our mules were in fine condition, but suffered in the steep ascent, being rather fat for such work. We met jackasses descending with loads of potatoes, beans, peas, barley, and oca, a species of potato, of a purple color, which is boiled and eaten as a vegetable, or put in chupe. The Indians pay great attention to the cultivation of the oca; its vine resembles the bean plant. Proceeding still further, we met with good pasture for cattle. The oxen were in fine condition, equal to those in the valley below. Here the Indians and their families live the year round, cultivating their little gardens for the markets of Cochabamba. Our mules are wet with perspiration, and we gain an uncultivated and uninhabited region, clothed in a thick sod of mountain grasses. The whistle of the vicuña is heard, and we dismounted to get a shot at three large partridges, the size of hens, the "Perdiz Grande," which are found on the pampas of Buenos Ayres. Our mules suddenly turn gray by frost formed on the ends of their hair. The clouds are forming, and we seat ourselves under their cool shade to breakfast, with a snow-capped mountain above, and far below the valley and city in full view. The farther side of the valley appears tilted up out of its level; beyond are the everlasting mountains.

The road through those hills leads south to the capital Sucre, with a population of 19,235. Sucre was founded by the title of "La Plata," silver, in a district known in the early days of the Spaniards as "Charcas." It was afterwards changed to "Chuqui Chaca," the Indian name for "gold place." It seems to have been a doubtful question among the Spaniards which was most appropriate, a golden or a silver title, both metals being found there. The republicans called the country after "*their* Washington," as Bolivar is often spoken of.

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The department of Chuquisaca, of which Sucre is the capital, has a population of 117,503 creoles, and 34,287 Quichua Indians. Half of that department is situated in the Madeira Plate, and the other in La Plata basin. Sucre stands on the edge of each; the water flowing from the south side of the city runs into the South Atlantic ocean; that towards us pays tribute to the North Atlantic. The Mamoré waters this side of the department, and the Pilcomayo the other side. We left the latter stream, when first noticed, where it broke through the Andes in the department of Potosi.

The climates of Potosi and Oruro are cold; those of Cochabamba and Chuquisaca temperate. The sky in the night on this steppe is generally clear. The productions of Chuquisaca are the same as in Cochabamba, with the addition of pasture for cattle, and timber in the ravines. In La Plata basin the traveller finds the Indian cultivating the sugar cane on the banks of the Pilcomayo, and distilling brandy and rum. From grapes he makes wine of good quality. The sugar mills are constructed of timber at hand. The tropical fruits, as the orange, lemon, chirimoyas, granadillas, and limes, grow in the valleys, while the productions of the table lands of the cold regions are found among the hills. Near the Andes, in the Pilcomayo, gold has been washed, and among the mountains there are abandoned silver mines. Five silver mines are reported to be worked at present. Stone coal, tin, copper, lead, and iron are natives. Rice is raised there, and the chick pea or brown bean, so much esteemed by the Spaniards. Particles of gold, rolled down from the foot of the Andes, have been washed from the alluvial soil near the river. It appears strange that gold should be found on the west side of the Cordilleras, and at the eastern base of the Andes, while on top silver predominates. We trace a connected outpouring of gold on the tributaries of the Pilcomayo, Mamoré, Beni, and Madre-de-Dios. Our map will show the links of this golden chain as wonderful as the golden legends told of the wealth of the Incas.

There are some very curious and ancient remains of magnificent edifices in the department of Chuquisaca which excite admiration, but to whom they originally belonged still remains a mystery.

Looking far south we see on our map the department of Tarija, with a population of 53,666 creoles, and 9,108 friendly Indians; but the eastern portion of this department is inhabited by tribes of very savage Indians, of whom there is little known. They roam among the forests and grassy plains, or among those great mountains which separate Bolivia from the Argentines.

The town of Tarija, capital of the department, contains a population

of 5,129, and is situated on one of the tributaries of the river Bermejo, which flows through the Argentine confederation into the Paraguay. My impressions, from information, are that the Bermejo is a deeper and a slower-motioned stream than the Pilcomayo, and that small sail-vessels may reach the town of Oran, a short distance south of the southern boundary of Bolivia. We are not, however, as certain of this as we are that the Pilcomayo has been reported not navigable in Bolivia. There is a wide field for exploration on La Plata. Grape-vines produce luxuriously in Tarija, and there the Paraguay tea—"yerba del Paraguay," is found. Cochabamba, Chuquisaca, and Tarija, are the corn-growing departments of this country; Potosi and La Paz are the potato districts.

The distribution of vegetable life, as presented to us in their elevated regions, places the potato the highest; the other plants run down in order—quinua, barley, wheat, coffee, and sugar-cane. Therefore the inhabitants on this side of the mountains have a self-sustaining supply without looking to other countries for sugar, wine, flower, potatoes, or tea; and the varieties of animal life offer them mutton and wool from the highlands, with beef and tallow candles from the steppe, on which exists the most dense population.

Our mules rested, and our breakfast over, we mount and slowly struggle upwards again; the bright sun shines clear upon the city below, while we have a cloudy day. It is interesting to see from under this cloudy curtain the beautiful natural-colored scene on this stage of wonderful creation. The panorama brilliantly lighted by the sun, which sparkles on the waters of the river as they dash along among the deep green foliage. The lakes are like mirrors, only rippled by the green breast of the wild duck. A long train of mules winds along the road from the Pacific; we just hear the great bell of the cathedral toll, when the clouds unroll and fall, shutting out light and view, as a mountain eagle shrieks. The scene soon changes as we climb higher up among the bare-headed rocky peaks; on our left is one gray with the snows of perpetual winter; on the right a great avalanche of earth has fallen from the crown of a mountain into the ravine, as though blown off by the prevailing winds from the opposite side. The jackasses we meet are loaded with fire-wood and charcoal, from an extensive growth on the eastern face. The Indians wear long hair on the back of the head, and never cultivate a growth on their faces.

The water draining from the snow forms the Lake Uarauara, which is dammed up at its outlet during the rainy season, and let out gradually in the dry, for the supply of Cochabamba. The chart will show its height above the city. We were disappointed in not finding game;

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neither water-fowl nor fish were seen. The waters are transparent and silent; nothing was moving except the clouds and the small veins of cold snow-water. Thin sheets of ice lie near the lake, and patches of snow on the brcw of the mountains resemble white cloths spread out on the ground to dry. Some of the rocks were broken in such perfect forms that we were almost induced to take them for houses, and hunt up a washwoman. The temperature of the water was 59°; air, 54°. In the valley of Cochabamba the temperature of a spring was 62° Fahrenheit.

A small quantity of the snow on a peak near this lake remains through the dry season; in the wet season the snow-line is constantly sliding up and down the sides of the mountains. When very damp the snow appears lowest, and sometimes reaches half-way down to Cochabamba; in the morning, as the sun rises, and his effects are felt, the lower edge of the snow-line is melted off, and to the eye it seems travelling up hill. The clouds are regulated by the precipitation. When there is much rain cloudy days follow, and the curtain round the valley arises from the moisture on the mountains. The lower edge of the curtain is lowered down in the morning exactly to the lower edge of the snow, and as it is evaporated the curtain rises in the evening, in time for those in the valley to behold the sun set behind clearly defined snow-peaks.

The climate, therefore, is very variable in the valley between the months of December and May. I have noted the thermometer in Cochabamba, 12th January, at 69°; in five minutes after, it was as low as 52° in the same place, in the shade. A man planting tube roses in his garden, without a coat, and in sheeting trousers, would run suddenly into the house for thick cloth clothing; in the mean time the hard hailstones destroy his flowers and drive cattle from their pastures.

Heavy storms frequently arise in the wet season, and blow violently through the valley, from southeast. The hail beats so hard upon the pear trees that the delicate leaves are broken from the upper branches, and the blossoms are destroyed. The hot sun withers the ends of the limbs, and they die, so that all the pear trees are stunted; and instead of large, clear limbs, the under branches are sapped by numbers of suckers that shoot out and rob the fruit of its life. Hence it is that not only pears but apples are very indifferent, but might be improved by trimming the trees, which the Indian does not seem to understand, and the creole cares less for the tree than for the fruit.

The willow grows up like a poplar; its narrow leaves present such a small surface to the hail or sun that they may be said to grow between the

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Eg: Lt L. Gibbon U.S.N.

Lith of P.S. Duval & Cº Phil.

LA LAGUNA DE UARA-UARA.

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drops. It is the tallest tree in the valley. The willow naturally grows by the side of streams, where the roots creep out into water or swampy ground. The apple produces best on higher and drier earth. Almost every plant in this valley has to be raised by irrigation.

We returned, after a harassing ride to Miraflores, "see the flowers," where we found the old Indian's wife had provided chupe for us, and lucerne for our animals. She had stirred in so much "ajé"—the red dwarf pepper—that we preferred her boiled corn. This seemed so strange she dropped several stitches in the woollen stockings she was knitting, and looked as much as to say, "Where do you come from, that you don't like ajé?" When she was paid for her kindness, she laughed, gave us apples, and sent her son to show the way through the peach trees and strawberry patches. The attention of the Indians is much attracted to hear us talking in English. They listen, look at each other, listen again, and say "don't understand *that*." Then they close up and stand in deep thought as they reflect. When they see we want anything they offer assistance or kindness, which shows a frank, honest hospitality to strangers. They seldom ask for anything; when they receive a gift it is with a quiet modesty, which speaks their thanks more plainly than words.

On our return to Buena Vista, in town, near the alameda, we found José with a fine young dog, which had been sent by a friend, and which we named Mamoré. The dogs in this country are often a miserable breed of curs. Mamoré appears to be a cross between a Spanish terrier and the mastiff; while very brave he is very affectionate, and being young enough to be spoiled by too much company, we train him as sentinel at night, and keep him very exclusive; his services may be very much needed on the journey; his color is yellowish brown, and he is of large size. The Indians are so partial to dogs that they raise more than they can conveniently support. The young aborigines seem to have greater fondness for animals than for each other. We have seen two of them pelting one another with mud balls, while a third seated on a sow, looking with delight at nine squealers helping themselves to milk. When she rose on her fore-feet, the child rolled off among the pigs, laughingly grasping the first tail in his way, to the great annoyance of his hungry companions.

We have news of the mail being stopped between Sucre and Oruro by a heavy fall of snow on the Andes, which was deep enough to break in the roofs of houses in Oruro, while here peaches are sold in the market.

The peach tree flourishes better than the apple, but both fruit and

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tree are small. The quince grows to an unusual size in the valley, and the trees are loaded with fruit of golden yellow.

The merchants are keeping back their remittances to the Pacific on account of numerous robberies reported in the snowy regions.

The young gentlemen give a ball every month in the palace, and performances at the theatre, which was once a church. On both occasions the families of the city are brought sociably together. The balls are believed to produce political concord, and are very gay. A Sucre lady inquired if "Cochabamba girls dressed in good taste?" The creoles seem anxious to know the opinion strangers have of them. The North American midshipmen used to say, the height of their enjoyment was to dance with the South American girls. The beauty, manners, and grace of the ladies here cannot be disputed; they are naturally gifted with a pleasing flow of conversation, keen-sighted, and witty. Their bright black eyes flash beneath an irresistible and modest smile; their long, black hair is neatly arranged abroad, but at home it usually hangs plaited over the shoulders and breast. They appear more proud of small feet than of lovely eyes and snow-white necks. In walking they carry themselves straight, and show their graceful figures to advantage; their motions are slow and steady. A bloom on the cheek gives them a fresh, healthy appearance as they ride spirited horses by the side of their lovers, through the gardens of Calacala, before sunrise in the morning.

At midday, on the 12th of May, 1852, we mounted and followed a train of nineteen loaded mules towards the east. Our baggage was reduced one half upon each animal. By law, the arriero may charge full price in descending the eastern side of the Andes for half the load carried on the roads of the table lands. The train followed a white mare with a bell hung to her neck. Four arrieros were accompanied by a number of women, carrying jars of chicha. The party seemed to have been drinking over night, and bent upon a frolic. They succeeded in seducing José, who rode along with our tent pole on his shoulder, and hat pulled over his eyes, ordering about men and women, until I was called upon to settle a difficulty between him and the chief arriero's wife. Richards was carefully guarding Mamoré for fear we would lose him. After some trouble in keeping the baggage mules from escaping up the cross streets, we bid farewell to Cochabamba. On the river bank the women seated themselves in a row to take the last dram with the men who were going with us. They shouted, sang, and danced; then shaking hands all round, the arrieros called to their mules, and we all moved along single file on our way home through the river bed, which was now dry again, the wet season being just over.

The minister of state sent circular instructions to all the authorities on my route, *rubriconded* by President Belzu, by which they ordered the prefects and governors to facilitate the expedition.

The President usually signs public documents with his peculiar mark or flourish alone, without writing his name. No man's signature in the country is valued without getting him to "*rubricar*" the document also. The custom is a Spanish one. They have been known to use their own blood or red ink, but the black ink does as well and is lawful. Our receipt book is a most *flourishing* volume. After José signs his name for his monthly wages, he straddles his legs, turns his head sideways, and gives a most gallant dash, occupying the remainder of the page, often through the paper on to the next leaf, with the point of the pen. We observe all along the route that the people generally *dash* better than they write. The rule may have originated for the advantage of those who could not write.

Passing over a level road and through the small town of Sacaba, we slung our hammock on the piazza of a hacienda at the foot of the ridge of mountains. Mamoré whipped the big house-dog and played with the small ones, while the fleas retaliated upon us. The mule drivers laughed among themselves when they saw us washing our faces in the morning, while they were snugly wrapped up in their ponchos. The country girls are quite pretty. The drovers we met on the road with horned cattle for the Cochabamba market, said they came from Villa Grande, in the department of Santa Cruz, to the southeast of us. The cattle come up with the winds. They are of good size and condition.

We turned to the northeast, rising up on the mountain. Leaving the valley of Cochabamba, the road lies through a gorge in a range where the Indians were digging potatoes and reaping barley. Descending again, we encamped for the night by an Indian stone hut, amidst the harvest fields. Don Cornello, our head arriero, purchased a sheep in partnership with us, and his men dressed it for the journey. One of them, who suffered with chills, Cornello dosed with a solution of cinchona bark from a bottle he carried with his bread in his saddle wallets.

In this small mountain basin, the thermometer stands at 52°, at 6 p. m., and wet bulb, 53°, with heavy frost in the morning. From the last ridge of mountains we see that the waters flowing towards the northeast go directly to the river Mamoré, and those which run to the southeast are tributary to the same stream, winding around the ridge, at the end of which is situated the city of Santa Cruz, which has a population of six thousand souls. The department contains a population of

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forty-two thousand two hundred and eighty-four whites, and twenty-six thousand three hundred and seventy-three aborigines. Santa Cruz is the rice-growing state of this country; it being mostly situated in the bottom of the Madeira Plate. Its climate is truly tropical—both hot and moist. It is well wooded and watered. Among the level lands there are lakes, and on the road to the town of Matto Grosso, there are alternately forests and plains covered with a growth of herd grass on which cattle flourish. Tropical fruits are raised in the gardens of Santa Cruz. The weavers of Cochabamba receive their cotton thence, as well as sugar and molasses. Both coffee and chocolate are of excellent quality, and some of the tobacco is equal to that of Cuba. The Nankin cotton of China is produced of a bright color, and contrasts beautifully with the white. The vanilla bean grows by the side of the Indigo plant. The Indian cultivates the pea-nut along the sandy banks of the rivers. The white man reports signs of cinnabar among the mountains at the end of this ridge, where wheat, maize, potatoes, and grapes are found.

The skins of spotted and black tigers are exported to the cold departments, with hides of horned cattle, horses, and the sloth. The feathers and skins of rare birds, snakes, and lizards are gathered among forest trees of the most brilliant colors. The cochineal insect has its place, while different species of bees supply the inhabitants with honey and wax.

The distance from the town of Santa Cruz to Cochabamba is one hundred and seven leagues. The arrieros generally lag along the road thirty days with a cargo of chocolate, coffee, and sugar, or with cotton manufactures, glassware, and salt in return. The trip from Santa Cruz to Cobija is made generally within three months by the way of Cochabamba and Potosi; the distance by the road being three hundred and forty-five leagues. The return cargo may arrive in three months more, but it is not certain that two trips to the Pacific coast and back can be made in one year. It must not be supposed a very extensive foreign trade is carried on with the department of Santa Cruz, though a most dense population is found on its western border. When we look at the list of productions in that region of country, we are struck with the independence of its inhabitants upon all external trade. A breakfast table in Santa Cruz, constructed of beautiful cedar wood, is described, covered with white cotton cloth, silver plates and dishes, with silver cups, forks, and spoons; coffee, sugar, cream, butter, corn and wheat bread, mutton, eggs, and oranges, are all produced in the province. Beef is found on the pampa, game in the woods, and fish in the rivers. Potatoes and all the garden vegetables are raised upon the plantations. The arm chair

of the creole is made of the ornamental "Caoba," or mahogany tree. Eight guests may be seated, each one in a different species of mahogany. His Indian servants gather grapes, make wine, collect the tropical fruits, and tobacco; while his wife or daughter take pride in well-made cigars. The climate is such that horses roam about all the year; there is no expense for stabling the animals. No barns are necessary for the protection of his harvests during a hard winter. His house may be as open as a shed. What little thin clothing and bedding his family require are supplied by the soil, and worked into fine cloth by the hands of Indians, who spin, weave, and sew. Silver he cares little for except in table use. Gold ounces are melted into crosses and earrings for the Indian girls. The inhabitants of Santa Cruz are therefore the most indolent in the world; under its hospitable climate, few men exert themselves beyond what is absolutely necessary.

It may be well to give, from report, an outline of the daily life of a family in this town. Very early in the morning the creole, getting out of bed, throws himself into a hamac; his wife stretches herself upon a bench near by, while the children seat themselves with their legs under them on the chairs, *all* in their night dresses. The Indian servant girl enters with a cup of chocolate for each member of the family. After which, she brings some coals of fire in a silver dish. The wife lights her husband a cigar, then one for herself. Some time is spent reclining, chatting, and regaling. The man slowly pulls on his cotton trousers, woollen coat, leather shoes, and vicuña hat, with his neck exposed to the fresh air,—silk handkerchiefs are scarce,—he walks to some near neighbors, with whom he again drinks chocolate and smokes another cigar.

At midday a small low table is set in the middle of the room, and the family go to breakfast. The wife sits next to her husband; the women are very pretty and affectionate to their husbands. He chooses her from among *five*, there being about that number of women to one man in the town. The children seat themselves, and the dogs form a ring behind. The first dish is a chupe of potatoes with large pieces of meat. The man helps himself first, and throws his bones straight across the table; a child dodges his head to give it a free passage, and the dogs rush after it as it falls upon the ground floor. A child then throws his bone, the mother dodges, and the dogs rush behind her. The second dish holds small pieces of beef without bones. Dogs are now fighting. Next comes a dish with finely-chopped beef; then beef soup, vegetables, and fruits; finally, coffee or chocolate. After breakfast the man pulls off his trousers and coat and lies down with his drawers in the hamac.

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His wife lights him a cigar. She finds her way back to bed with her cigar. The dogs jump up and lie down on the chairs—the fleas bite them on the ground. The Indian girl closes both doors and windows, takes the children out to play, while the rest of the family sleep.

At 2 p. m. the church bells ring to let the people know the priests are saying a prayer for them, which rouses them up. The man rises, stretches his hand above his head, and gapes; the dogs get down, and whiningly stretch themselves; while the wife sets up in bed and loudly calls out for "fire;" the Indian girl re-appears with a "chunk" for her mistress to light her master another cigar, and she smokes again herself. The dinner, which takes place between 3 and 5, and is nearly the same as breakfast, except when a beef is recently killed by the Indians, then they have a broil. The ribs and other long bones of the animal are trimmed of flesh, leaving the bones thinly coated with meat; these are laid across a fire and roasted; the members of the family, while employed with them, look as if all were practising music.

A horse is brought into the house by an Indian man, who holds while the "patron" saddles and bridles him; he then puts on a large pair of silver spurs, which cost forty dollars, and mounting, he rides out of the front door to the opposite house; halting, he takes off his hat and calls out "Buenas tardes, señoritas"—good evening, ladies. The ladies make their appearance at the door; one lights him a cigar; another mixes him a glass of lemonade to refresh himself after his ride. He remains in the saddle talking, while they lean gracefully against the door-posts, smiling with their bewitching eyes. He touches his hat and rides off to another neighbor. After spending the afternoon in this way, he rides into his house again. The Indian holds the horse by the bridle while the master dismounts. Taking off the saddle, he throws it into one chair, the bridle into another, his spurs on a third, and himself into the hamac; the Indian leads out the horse, the dogs pull down the riding gear to the floor, and lay themselves on their usual bedsteads.

Chocolate and cigars are repeated. Should the creole be handed a letter of introduction by a stranger travelling through the country, he immediately offers his hamac and a cup of chocolate. The baggage will be attended to, and as long as the traveller remains, he is treated by the family with a degree of kindness and politeness seldom met with in fashionable parts of the world. No alteration will be made in their mode of living on account of his being among them, except that the dogs and horses are kept out of the house, and there is less dodging of bones. Pride and a natural feeling of good manners prevent the stranger from seeing such performances. The creole speaks of the wealth of his

country in the most exaggerated manner; he has so many of the good things of the world at his door, that he naturally boasts; he thinks little of other parts of the world; he has no idea of leaving his own fruits and flowers. The roads are bad; he cares little for their use. When he leaves his native city, it is more for pleasure than for commerce. He is not obliged to build railroads that he may receive at low rates of freight the tea of China; the sugar of the West Indies; the flour, iron, or cotton goods of North America. His own climate is so agreeable that he seldom wishes to travel; there is no place like *his* home! When the traveller inquires how he would like to see a steamboat come to the mouth of the Piray river, the water of which he drinks, his eyes brighten, and he smilingly says "he would be delighted;" at once telling what he would put on board of her as a cargo for the people who sent her. He is contented with the roads constructed by the hand of the Creator of all things; but the creole is honest in his desire to see what he has never yet seen—a steam-engine move a vessel. He is ready to sell his produce to those who come to him; yet when you inquire what he desires from other parts of the world, it is very certain, from the length of time it takes him to answer, that he seldom thinks he is in want of anything; and if asked how much he is willing to subscribe towards purchasing a steamboat, his usual answer is, that "he has no money, and is very poor!"

The Spanish language is more generally spoken in Santa Cruz than in other parts of this country. The Indians are taught and practise that language to the exclusion of their own. The people of Santa Cruz pride themselves upon their pure Spanish, and ridicule the speech of those of other towns. The teachers of most of the schools in Cochabamba are natives of Santa Cruz, as well as the most intelligent of the clergy, who are generally foremost to speak of the advantages of establishing trade with the Atlantic ocean by the natural river road, instead of looking constantly towards the Pacific. Santa Cruz may be called the frontier town of the Spanish race, who have swept over the country from the Pacific. The bay of Arica bears due west from Santa Cruz. As the coast of South America bends at Arica, so the Spanish have pressed far in towards the centre of the continent, placing those on the eastern border of Bolivia nearer to the Atlantic than the people of Peru; although they seem to be farthest from the markets of the world, they are the nearest, and are best prepared for entering into commercial relations with the United States of the North.

The industrial, agricultural, and manufacturing people of this country are principally among the aborigines. They plant the sugar-cane,

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gather the coffee, work the mines, and transport silver, copper, and tin to the coast of the Pacific. Looking on the map, and running the eye along the road from the town of Santa Cruz towards the southeast, the traveller finds a country nearly level. Among hills near the river Paraguay, in the province of Chiquitos, the inhabitants are composed of many tribes of Indians; some savages are warlike, while others are inoffensive and friendly to the whites. Those of the small villages of Santiago and Jesus are described as nearer the color of chalk than of copper, and to be a robust, intelligent people, willing to be taught the Spanish language, to cultivate the soil, tend cattle, and give up the life of wandering for that of the civilized man, under the instruction and labors of the Jesuits; while the tribes south of them, near the mouths of the rivers Pilcomayo and Bermejo, obstinately refused any such interference, and remain savage to this day. They are the Gran Chaco Indians, and are called Tobas. As they are unfriendly, we have no account of their number, and will confine ourselves to the Chiquiteños, who understand the art of planting and gathering a harvest, the management of cattle on the grassy plains, and the collecting of wax from the forest trees, with which, and the cotton they cultivate, they pay tribute to the State, as well as with salt from lakes found in the wild regions. In their little huts are carpenters, blacksmiths, silversmiths, shoemakers, tailors, and tanners. Their houses are usually built of adobe, and thatched with coarse grass; yet they were taught to burn tiles for the roof of their little church. For the purpose of manufacturing sugar and melting wax, they erected founderies to smelt, and fabricated their own copper boilers. The cotton of their small farms is woven by hand into ponchos, hamacs, saddle cloths, and the fine cloths of which their white frocks are made, after a fashion of their own invention, in bark. The women in Chiquitos are good farmers; most of the spinning is performed by them, as well as the manufacturing of chicha from corn and yuca.

They find gold and silver in the tributaries of the Otuguis river, with which they decorate the altars of their churches and hammer into crosses, ear and finger-rings.

The men make straw hats, more for sale than for their own use—for both sexes go bare-headed—a good sign of a delightful climate, as it is said to be. The baskets made of the leaf of the palm-tree, which grows in the plains, are carried on their backs as they travel through the country. On such occasions they are armed with bows and arrows. In the Spanish settlements, near the unfriendly tribes, they are permitted to attend church with war-clubs and other weapons, for the protection of

their wives and children from an attack while at prayers. The church bell is a signal to the savage, but he takes occasion at times to commit murder under its calling.

Their houses are very small, with but one entrance, so narrow and low that it is supposed the country was called Chiquitos, because of the little door-ways. When first the traveller peeps into the house all is darkness; on entering, the light from the hole he came through shines against a few earthen pots made by the women, an axe, macheta or cutlass, bows and arrows, pretty Indian girls, and dogs without number. The boys are rambling about; the old Indian and his wife are cultivating the chacra. Their great ambition seems to be celebrating the feast days of the church, playing ball, drinking chicha, and making love to the women.

These Indians are great musicians, playing upon the violin and tamborine, while the women sing and dance with grace. Few of them quarrel; should a difficulty take place, seldom more than three or four blows are struck. They all carry knives, but these are not often drawn. If one man kills another, his shame, compunction, and fear in after life is much worse than death, I am told.

The Chiquiteños are very apt in learning to read, write, and calculate. They have intelligence enough to know that knowledge is valuable to them, and the children speak Spanish with great ease.

Lime and plaster of Paris are found among the hilly portions of the province. Salt from the lakes is of great value where cattle are raised. There is a market for it in the Argentine republic, Paraguay, and in the Brazilian district of Matto Grosso. In all parts of this province saltpetre is found, of which the aborigines manufacture powder, to make fireworks for the churches. The rockets, they send up towards the heavens, under the dark shade of night, light the wilderness around, and was one means used by the Jesuits to attract the attention of the wild man to seek religion. The Chiquiteños are a peaceful race; their gunpowder is only used for the purpose of lighting the way towards Heaven—a lesson to civilized men who sometimes employ it too freely for the destruction of their fellows on the earth, of which they form a hell!

The Indians cast church bells. Brass, copper, and zinc are sent by the Aymara Indians from the Titicaca basin in exchange for sugar and wax. They are unacquainted with the process of casting cannon, or the art of making the brass armor of olden times.

The Indian of Chiquitos, like the creole of Santa Cruz, has his full share of the delights of this earth, which he enjoys in his own way. When he takes a fancy to wear striped trousers, he plants a row of

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white cotton and a row of yellow. These colors contrast without the trouble of dye-stuff; should he wish a blue, he plants a row of indigo; when he requires red, he gathers cochineal from among the woods, where he also finds a bark which produces a deep black, which the women often employ to dye their white dresses.

The heart-leaved bixa grows wild; the vanilla bean scents the doorway, while the coffee and chocolate trees shade it. The sugar cane may be planted in any part of the province, to be manufactured into sugar, rum, and molasses during the year of planting. The Indian understands the art of distilling. He cannot be considered intemperate, generally; considering his partiality for chicha, we are inclined to give him credit for self-denial, except when the saints' days of the Catholic church are celebrated, then it seems to be understood that much drinking is one of the conditions. Whatever good ideas may be instilled into their minds by the worship in the morning, are generally lost under the effects of strong drinks at night. This custom shocks the stranger. An excuse has been offered by some who resided among the more savage race of men, that in the exertions of the Jesuits to change the worship of these people from their own barbarous imitations of the actions of tigers and poisonous serpents, the priests were obliged to allow them to continue many of the most innocent popular customs, such as dancing, singing, and drinking, as well as fighting sham battles on a Sunday evening, until they were enabled to lead them gradually to perceive these were not the forms of worship which would most please the Almighty. Among these Indians, as among the people of Japan, "every custom is a part of their religion." Music has a powerful effect upon the savage, and therefore the Jesuits encouraged them to cultivate it, and as its influence over the limbs of the women was so great, that they could not stand still during that part of the church service, it was thought best to permit them to dance at the door, after which they quietly entered to say their prayers. But when the music commenced again they returned to dance in their savage fashion. They are naturally a good and tractable people, finally willing to do their dancing at home, or only on particular occasions at church after the Jesuits were long enough among them. At the present day there are times when the war dance is allowed in front of the church, performed by the able-bodied men of the nation with war clubs and hatchets in their hands.

The drinking of chicha was a portion of the primitive worship of the aborigines. They no doubt honestly believed that, the more happy they made themselves while paying respect to the Creator of all things, the better He was satisfied! They were sincere in their thankfulness to

God for the blessings they received at His hands. The Jesuits found that the Indian had adopted this means of praise, and the effects produced were so agreeable, that it was not an easy matter to persuade the old Indian to give up his liquor. If force were applied he undoubtedly would fight for it, so that a mild manner had to be pursued until *time* worked its wonders. The Jesuits were obliged to keep back an expression of disapprobation of this custom for the purpose of converting the savage in any way, and persuaded him to attend church in the morning, and to postpone drinking until after the service. The Indian entered willingly into this compromise, and after being fastened up in church under new forms, which he did not understand, he found it rather dry, compared to what he had been accustomed to. So the moment he got out he returned to his mode of worship, and in the afternoon became generally intoxicated. The women dance to music all the way home on the road; the frolic is kept up the greater part of the night. On Monday morning the congregation were generally complaining from the effects of dissipation. This was the time at which the influence of the priest was brought to bear upon them. They were taught the art of cultivation; there minds were diverted by novel undertakings. The women were encouraged to spin, attend to the cotton plant, and to make use of chocolate. There was little or no difficulty in keeping them from chicha during the week, as they seldom made improper use of it except at the time devoted to religious worship, and that had now become a fixed one by the Jesuits, namely—after six days of labor.

Among the forests are found gums, which are used at the altar; the Indians gather and sell them to the church for incense. They also collect the sponge plant from which they extract oil. They seek transparent copal with the copaiba balsam, the gum of the storax-tree, and roots of the jalapa, ipecacuanha, and sarsaparilla.

"Mate," the tea of Paraguay, is grown in Chiquitos, with a number of species of the palm tree. There are ornamental and dye woods, many of which are only known to the Indian; few of them have been brought fairly to the notice of the mechanic.

Chiquitos is within the tropic of Capricorn. The natives enjoy the fruits of the banana, the plantain, and oranges, both sweet and sour. The grape yields wine, and from the wild apricot a pure vinegar is made. The much esteemed chirimoya is found there by the side of the pomegranate and granadilla, the pine-apple and water-melon, the mandioca, the sweet and other potatoe, guavas, pea-nuts, maize, and wheat. This is the agricultural district of Bolivia. Chiquitos will rob Cochabamba of its name "Granary," and prove a finer garden than Yungas. The

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hide and tallow trade of Buenos Ayres will be enlarged by the yield of the pampas of Chiquitos. The trade of La Plata must be increased when the productions of this beautiful land are sent out upon its waters, and floated down to the sea.

In the small town of Oliden, the Indian carries to market lettuce, onions, capsicum, tomatoes, the cummin plant, wild marjorem, parsley, mustard, radishes, and the sweet-scented seed of the anise, with a species of moscatel grape.

From what I can learn from persons who have navigated the upper waters of the Paraguay, there is every reason to believe that the navigation is open from Cuyaba, the capital of the province of Matto Grosso, in Brazil, down to the ocean. It is said there are no falls, and that if there should be too little water on the upper streams in the dry season of the year, the produce of these countries may be sent down with ease in the wet seasons, when the rivers rise several feet, and are not very rapid.

CHAPTER VII.

Diamonds—Animals of Chiquitos—Decree of 1837, and act of Congress—Señor Oliden's voyage on the Paraguay river—Salt—Fall of trees—Descending the mountains—Monkey meat—Coca plant—Espiritu Santo—Creole workmen—A night in the wild woods—Yuracares hunting—River San Mateo—Province of Yuracares.

It is a singular fact that no diamonds have been found on the Bolivian side of the Madeira Plate or La Plata basin, while among those streams, in Brazil, which flow into these rivers diamonds abound. The general opinion is that these precious stones do not exist in Bolivia. The streams which pay tribute to the Madeira and Paraguay, from the east in Brazil, are clear water rivers. In these transparent waters the diamond is easily discovered. The washing away of the earth on that side is not very great, even in the rainy season of the year.

All the streams on the western or Bolivian side bear muddy water; the wearing away on that side is very great. The filling up of the Madeira Plate is done from that side, just as the Titicaca lake is filling up the fastest on its western shore, so that the diamonds of Bolivia, if they exist, are lost in the mud. We were told by diamond hunters that in rivers where the divers descend some distance, they find the water coldest on the bottom where they pick up the precious stone, and the men are so chilled when they returned to the surface, that they require to be warmed by the side of a large fire, even under the heat of a tropical sun.

In the woods, and on the pampas of Chiquitos, roams the Tapir or Brazil elk, the meat of which resembles that of the ox, and is considered a delicacy by the Indians. In the forests, the fields, and about the rivers, birds abound. The wild boar pushes his way through the grass, and the American lion or jaguar leaps to fight the spotted tiger for the fatted calf. The bear and wild-cat prowl through the tangled creepers, while monkeys and parrots chatter their own peculiar idioms. The fox and armadillo inhabit the hill sides; near the river banks the turtle deposits its eggs. Large and small snakes require no search.

From the Pacific coast to the Paraguay river, on the parallel of 18° south latitude, there are three different climates; that of Oruro, cold, with an unproductive soil, thinly populated, and the inhabitants generally poor; the towns becoming every year more and more depopulated, and the resources of the country less valuable than in former years.

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The ruins of the ancient Peruvians there stand as truthful memorials of "the Past." Descending the steppe of Cochabamba, the climate is temperate, the soil more productive, the inhabitants increasing in numbers, and the Spanish race in their strength. Here are found the most intelligence and the greatest improvements. In the heart of the nation are living examples of "the Present."

Proceeding to the bottom of the Madeira Plate into Chiquitos, we find the means of agriculture, commerce, and manufactures on the very top of steamboat navigation, presenting to us elements of the blessings of a peaceful "future."

The nation of Bolivia now stands facing the Pacific coast. The appearance of one little steamboat on the Paraguay river, anchored on the coast of Chiquitos, would turn the whole "right about."

On the 27th of December, 1837, Andres Santa Cruz, President of the republic of Bolivia, issued a decree by which foreign merchandise should enter the province of Chiquitos and Mojos free from all duty or tax whatever, and that all the productions of these provinces should be exported upon the principle of free trade.

On the 5th November, 1832, the Bolivian congress, as compensation for revolutionary services, had granted to an enterprising citizen, Don Manuel Luis de Oliden, a tract of land, twenty-five leagues "in all directions from a point on the river Otuguis."

Señor Oliden sent me a short account of an exploration made by his relative, Señor Don José Leon de Oliden, in the year 1836. Mr. Oliden launched a canoe in the river Cuyaba, from the town of the same name, in the province of Matto Grosso, in Brazil. It was during the dry season, in the month of October, when the river was shallow. Descending he found the banks low, and the country as level as a floor in some places, while here and there the land swelled up like a smooth heave of the ocean in a calm. During the wet season of the year, a portion of the journey from Cuyaba to the frontier of Paraguay can be made in canoes over the same road, travelled in dry weather on horseback—the whole country being overflowed, except on the higher grounds. On the seventh day after leaving the town, the canoe touched the waters of the Paraguay river, the banks of which are inhabited by a nation of Indians called "Guatos," who came off in a friendly way to offer fish for sale, and were delighted to receive payment in a glass of rum. On the Bolivian shore, opposite the mouth of the Cuyaba, the land is hilly, the elevations range with the stream, and also stretch back into the Bolivian territory. Among these hills is a large lake, called Gaiba. Descending the stream of the Paraguay river for two days, brought the canoe opposite the ancient town of "Alburquerque," which was abandoned, the people having moved off to another part of the country. Two days farther down was the mission of the "Guanas," inhabited by about fifty families, who formed the new settlement of Alburquerque. Near the frontiers of Brazil and Paraguay, he passed the fortress of Coimbra, erected in 1775.

Mr. Oliden then entered the territory of Paraguay, searching on the western shore of the river for the mouth of the Otuguis, which he desired to ascend to the town of Oliden. He suddenly came in sight of the Forte de Borbon, with twelve pieces of iron cannon, from which several shots were fired at his canoe. He pushed on and landed at the port, where a soldier met and conducted him up the bank. He sent his compliments to the commanding officer, and requested permission to enter; the soldier returned with permission. His passport was demanded; in handing it to the commander, he told him he had a letter of recommendation to his Excellency the Supreme Dictator of the State from the Governor of the Brazilian province of Matto Grosso. The commander replied, that he could not allow him to descend the Paraguay without *special* permission to do so from the one man who ruled the country. Mr. Oliden requested that he might continue down to Assumption, the capital of Paraguay, and present his letter in person to the "Dictator." The commander replied, that he could do "ni uno ni otro"—neither one nor the other.

Mr. Oliden, finding his requests fruitless; that the gates of Paraguay were shut in his face, and that the great highway cut through the earth was closed up by this one man's power; that the trade of Chiquitos and all of Bolivia was blocked by this passage, and that the people of his country were cut off from the path of peace and commerce, took leave, and returned to his canoe to await a passport giving him permission to *retrace* his steps. The logs of wood that floated by on the stream of the river excited envy in the heart of the enterprising Oliden; they were free and he was chained; for he was forced to go where they would not go—up the stream again. Had he dared to push his canoe off and let her float quietly down by the sides of the logs with the current, there were one hundred soldiers ready to take arms against him, and insultingly turn him back. He remarked that the soldiers had very expressive faces, were tall, well-made, handsome-looking fellows, stout and white. They spoke the "Guarani" and Spanish languages. They brought him "mate" and tobacco, for which he exchanged a little gunpowder and a cotton handkerchief.

The soldiers were nearly in a state of starvation. The government had

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in the Argentine republic, in latitude 27° south, through the mountainous regions to Lima. She is the admiration of all good judges, from the arriero down. The reason she has kept in good order, while the mules throughout our route, from Lima to Oruro, look so miserable, is because José constantly gives her salt, and I observe it is not the general custom of the country to do so. The good old padre we met in the montaña of Cuzco was an exception. He called his cattle from the woods to offer salt. The moment they heard his voice the bulls came rushing out as though they were angry with him. It was a beautiful sight to see the fierce-looking animals halt in front of the old gentleman, robed in his clerical garments, and gratefully lick salt from his hands; afterwards rubbing their horns against his legs by way of thanking him. He did not seem to like this much. It may be mentioned in confidence, padres in these countries sometimes go about without trousers.

I met an intelligent gentleman, Mr. Mauricio Bach, who had spent some years in the province of Chiquitos, and to him I am indebted for much information.

Mr. Bach travelled by land from Rio Janeiro to Bolivia; he was fresh from his own country, and was so much impressed with the value of the lands, productions, and climate of Chiquitos, that he remained there some years, during which time he had a fair chance of judging it. He told me that the route through Brazil is inhabited by some savage Indians; on the plains herds of cattle are raised, and there was much wood. He passed over with a large party, who were prepared to protect themselves from the unfriendly Indians; but at the present day the mail from Rio Janeiro reaches Cuyaba every month.

The town of Santiago, in the southern part of Chiquitos, is situated on a hill of the same name, and has a population of 1,380. The climate is delightfully fresh, healthy, and compares well with Chiquisaca, with the difference that the air is not so dry in Santiago; it is free from all troublesome insects also. The country is well watered. The streams which flow into the river Oluquis contain gold, silver, signs of cinnibar, and a suspicion of precious stones. In the forests are ornamental woods and medicinal plants. To the south of Santiago the country is thickly wooded with a great variety of palm-trees. In the plains the pasture affords a plentiful supply of cattle and horses already there. The soil is so fertile that the products of both the torrid and temperate zones may be produced, from chocolate to the wheat and sugar crops. On the river Agua Caliente Mr. Oliden, in the year 1836, established a town, and called it Florida, over the ruins of the old settlement of Santiago, where the Jesuits first established themselves in this wilderness.

The Indians built large wooden houses, cleared the land, and raised an abundant crop of rice, superior to that of Bengal.

From the size of the streams which empty into the river Otuguis, their slow, steady current and deep water, Mr. Bach considers that a steamboat could come up from the ocean to these rice lands, but neither he nor Mr. Oliden could descend to examine, partly from the fear their Indians had of the savages, and want of knowledge in the management of canoes, which they did not use like the Brazilian Indians. Mr. Oliden gave up his residence, returned to Sucre, and finally to Buenos Ayres, through the Argentine confederation, leaving his valuable lands and their productions to the Indians, who live an easy life, in plenty and in an hospitable climate.

There is dispute at the present day between the Brazilians and Bolivians with regard to the boundary lines between their two countries. Bolivia claims to the middle of the Paraguay river; but one of the Brazilian commanders observed to a Bolivian that the Brazilian government claimed as far west as the cattle of Brazil roamed, so that it is rather a difficult question to determine exactly where the initial point shall be, and then whereabouts a line could be drawn.

By treaty between the Spaniards and Portuguese, made more than a century ago, the southern initial point was marked at the mouth of the Jaurū river where it empties into the Paraguay; thence in a straight line to the nearest point on the Guapore or Itenez, should be the eastern boundary of the territory of Bolivia, which certainly makes the middle both of the Paraguay and Guapore, or Itenez, the division line between the two countries. The question was not, however, of much importance formerly either to Brazil or Spain, but now, as the South Americans are beginning to awaken to the importance of commerce and steamboat navigation, the Bolivians raise the question how far they are entitled to these natural communications and necessary outlets. This is a matter of interest to Bolivia; for if she gives up a right to the Paraguay river, she has nothing on her southern border to fall back upon, except the river Otuguis, which may not be navigable. After the Paraguay leaves Bolivia and Brazil, it then flows over the soil of Paraguay and the Argentine confederation. Each claims the ownership of the *navigable* waters at the head of the La Plata, which God made for all.

We began to descend the great ridge of mountains to the northeast, with a hope that we may not be obliged to retrace our steps. The moment we touched the brow of the mountain, a thick fog-bank stood before us, thrown up like a great fortification. The wall was distinctly marked along the ridge, while on the southwest side the sun shone

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brightly. The mules, one by one, entered the thick mass of steam vapor with great hesitation. It was with difficulty the arrieros could push them in, so much did they dislike to descend. As they had travelled the road before, they turned and ran back into the light, but the men finally succeeded in getting them all in.

In the sunlight behind us, there was a short growth of short grass, with a portion of the soil burnt into a hard and scaly crust, like the outside of a steam-boiler. As soon as we had passed under the fog, the earth was found covered with a green sod; flowers bloomed by our path, and the foliage of the bushes covered the sides of the ravines, while the forest trees lined the bottom. The green surface looked like the waters of the sea as they flow up on the land, pushing towards the top of the mountain ravine in some places, while in others, where a bluff stood out, the foilage was forced back, as if the elevation was too high for the green wave to cover it.

Under this thick cloud the Indian finds fire-wood; here he burns charcoal, which is used by the silversmiths, the blacksmiths, and the city cooks. In the valley he gathers ornamental woods for the cabinet-maker. After he has cut down trees and sold them, he finds that his corn crop will yield him a plentiful supply without the trouble of leading water through the fields with his hoe, for the rains come down on the land so plentifully that he has nothing to do but to admire what they do for him; while his neighbor, on the other side of the mountain, eats only by the sweat of his brow.

For his comfort, the Indian must build himself a house for protection against the rains. He cuts four forked poles, and stands them up as supports to a thatched roof, slings his cotton hamac from post to post, and there enjoys his rest, swinging in a cool, pleasant climate, while he looks out upon the growing maize, and listens to the dashing waters of the mountain streams.

We halted and asked permission to encamp on the third night from Cochabamba, and to pitch our tent among an orchard of peach trees. We cooked supper by the Indian's fire, roasted a wild goose, shot during the day in a small lake, while José made tea and traded with the Indian for fodder.

May 14, 1852.—At 5 p. m., thermometer, 58°; wet bulb, 57°; cloudy and calm. This observation is made in the peach orchard, not far below the gorge through which we passed. After spending an uncomfortable night in our tent, which we find rather close in this dense atmosphere, we loaded up and pushed down through the forest-trees over a most dangerous road. In some places the mules jump down

frightful steps, where trees stand so close together that the baggage catches on both sides. I have constant fear that the instruments will be ruined, or that some of the animals will break their necks or our own. The water in the mountain streams being very low, we cross some of them by wading. The rapid ones we pass on miserable bridges made of long poles thrown over, and then covered with the branches of trees. Their wide dry beds indicate great floods in the rainy season. The arriero mentioned having lost half his train, with all the baggage, in an attempt to cross during the wet season.

Our route from Tarma to Oruro was south. We travelled ahead of the sun. In December, when we arrived in Cochabamba, the sun had just passed us. As soon as he did so, the rains descended heavily on this side of the ridge; it was impossible to proceed. The roads were flooded, the ravines impassable, and the arrieros put off their journey until the dry season had commenced. After the sun passed the zenith of Cochabamba, and had fairly moved the rain-belt after him towards the north, then we came out from under shelter, and are now walking behind the rain-belt in dry weather, while the inhabitants are actively employed in tending their crops.

After travelling all day through the woods, we encamped near a house owned by a white man, with a wife and large family of children. The place was called Llactahuasi. On the road we shot a wild turkey, which was fortunate, for the woman declined selling us the only old hen she had, as her brood of little chickens were too young to do without parental attention. The only other living things about the house, besides the children, were two dogs. The question first asked by our people on arriving at a house is for provisions, so as to forestall the same question from the poor settlers, who are found along the road at uncertain distances. The country may be said otherwise to be uninhabited even by wild Indians.

May 15.—At 4 p. m., thermometer, 73°; wet bulb, 71°; clear and calm. An increase of 15° of heat since this time yesterday. Temperature of a stream, 56° Fahrenheit. As the mountains dwindle into hills, the trees increase in size and the undergrowth thickens. Thousands of creepers are tangled in the most confused manner. The branches of the woods are loaded with a thick growth of moss, and immense masses are heaped up on the tops of the trees. The creepers run up the trunk, coated with moss on the south side, crawl out on the branches, and thence grow down to the ground from the end, on which another creeper ascends, until the branch becomes so loaded that it breaks down with the weight. The tops of the trees grow up, and then are pulled

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down by these huge vines, which hang like hempen cables. While the climate and soil encourage the forest trees, the creeping parasites seem determined to drag them downward. There is a constant cracking noise of snapping branches, accompanied by a thundering roar, when large trunks are brought down. Great logs cross our track, and we dare not look aloft, for fear of seeing increased danger. A creeper runs up the trunk of a large tree, and out on a limb, descends to another large tree, and turns itself round the butt as if done by hand; then it wound its way up to perform the same effort again, while the branches or roots were all pulling like so many braces, until the limb was broken from the tree. As it drops to the ground, there is a thick moss ready to grasp it, and the log is soon covered out of sight and rots.

Some of the larger trees have been torn up by the roots, and have fallen to the eastward, as if done by a sudden gust of wind rebounding from the side of the mountain. All the easterly winds that strike the broad side of the Andes do not glide upwards, but the current is sometimes divided. The lower half turns under, sweeping down over the forests with such force back towards the east as to break down the trees and place them in the position referred to. The winds cannot rebound horizontally, for they would meet each other and produce a calm. Their only means of escape is either close down on the surface of the warm earth, or up into the more rarified regions. When the heavy gales, which sometimes blow in the rainy season from the eastward, strike these lofty Andes with a force that uproots the forest trees, destroys the crops, and sets the ocean in a rage, they accumulate here, and must burst their way out. They would split the mariner's heavy canvass sails and blow through; but here the gigantic strength of the mountains resists them with a composure that makes the forest the sufferer. These heights of the eastern side of the Andes are among the most terrific portions of the earth. They seem to correspond to the rocky shores of the ocean, where the waves beat heavily against their banks. The trees, bushes, vines, creepers, and mosses are heaped up just here, like we find sea-weed hanging on the rocks of the sea-coast. The fisherman paddles his canoe into the calm ocean beyond the troubled breakers that strike against the land. Here we find no inhabitants. There never were any. We discover no ruins or marks of bygone ages. These primitive forests are not inhabited by the savage of the present day. Here are no birds among the trees, except the wild turkey; he walks through the bushes and feeds on berries. There are very few of this family, much to our regret. Few wild animals roam about.

While descending the mountains to the east of Cuzco, we found what

we see here, numbers of land shells. This, then, may be called the snail district. They are certainly in the majority, and the only thing with animal life, which seems to flourish in these inhospitable places. If our poor mules were not so very sure-footed, we would never be able to descend by this road, which is so precipitous in some places that horses could not travel and carry a man. The short-legged donkey would be lost in the deep mud holes, which the mules jump into and then leap out. At night they are turned on the path to devour leaves from the bushes, or seek some palatable herb among the trees; there is no shelter nor pasture for them. Our party encamped in the wilderness as much exhausted as the animals. The climate is damp and sultry, and when we lie down to rest the season is so gloomy, it seems like a long and tedious trance. Our old arriero proves to be a polite and amusing character. He is a creole; makes a living by travelling down this road with salt and returns with chocolate. Every now and then, after we have passed a difficult part, he turns with most downcast expression and says, "Ah! Patron! your boxes are very heavy for my mules." We tell him the roads are bad in his country. "They are much better than they used to be." He said when he travelled on the table lands, we became very tired of riding all day, but here we went so slow that he did not feel fatigued, particularly on his way up, when his mules were poor and could scarcely climb back. He told us that it required at least six weeks rest for the mules in Cochabamba, keeping them well fed on lucerne all the time, before they were fleshy enough to load again for another trip down. His full name is Cornelio Cespedes; he had been engaged travelling up and down the Andes for a number of years, and appears to be an honest, worthy man. Cornelio begs me to sell him Rose. I object, because she would have to travel this dreadful road.

Descending some distance, the first sign of active animal life was a perfect swarm of ring-tail monkeys. They travel along among the tops of the trees at a rapid rate, first swinging to a limb by the feet, and then by their long tails. A little one, who looks in the face like a young negro, sometimes gets frightened and calls for his mother, who promptly runs to his assistance, when the cunning rascal jumps on her back, holds on to her hind leg with his tail, and gallops her off to the next tree. The noise they make deafens us, particularly after a shot is fired. They are not easy to kill. The men are very fond of the meat, probably because there is not much other to be had on the road.

Our beds became wet by the rains during the night; this encourages the fleas in our blankets to annoy us, and although we were tired

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enough to sleep, we were not able to do so. We mount very much exhausted, while our animals stagger with the weight.

The arrieros pile the baggage up in a heap at night, and cover it with the pack-saddles. Our boxes were well covered with tarpaulins before we left Cochabamba, and I had them lined and soldered inside with tin, to be water-tight. We find this a good plan. No doubt we should have been wanting in provisions had our boxes leaked, for the rain ran off the sides of the hill, flowing round the baggage. Travellers supply themselves with biscuits baked hard, without salt, as it melts in this moist climate and the bread spoils. We carried cheese, tea, sugar, rice, cakes of chocolate, and sardines, with two biscuits a day, and what we could gather with our gun in geese, turkeys, and monkeys. We worked along much better than our poor animals. The article we found most valuable was rice. A wild turkey, cut up and well boiled with rice, seasoned with a small quantity of ajé, a lump of Potosi salt scraped with it, was most refreshing after a hard day's travel. The greatest favor to a traveller met on the road in the forest, is to present him with a biscuit. The patron who shares his bread with the men will always get through. The arrieros generally carry a bag of roasted or parched corn. It is amusing to see them luxurating on the hind leg of a ring-tailed monkey, taken alternately with a grain of parched corn. They say the tail of the monkey is the most delicate part when the hair is properly singed. If our game gave out, and it became cold monkey or nothing, we opened our box of cheese. Monkey meat keeps longer than any other in this climate; carried on the side of the baggage, it becomes tender during the day by beating against the trees as the train passes along. Of the skins the arrieros make pouches, in which they carry coca beans and parched corn, suspended by the tail to a strap round the waist, with the legs tied one to another, hair side out. This is thought ornamental, and a greater protection from wet weather than the best tanned leather. The arrieros are generally cheerful fellows, and are always anxious to point out game, generally looking for turkeys, knowing that the four-leg kind will fall to them alone.

There is great trouble in getting a fire; the dead wood is so much soaked by rains that José has to inflate his cheeks till the tears run out of his eyes. Every man carries a flint and steel with him. Arrieros sleep soundly with their heads in the rain and feet in the ashes.

On the evening of the 7th May, we reached the Espiritu Santo; following it for some distance we came to a lonely house, situated in a beautiful and romantic spot. Standing at the door, looking up the ravine, through which a stream dashes, the great Andes appear in might, wrapped in their misty robes. The freshness of the foliage and thickness of the leaves present different shaped clusters, so heavy and massive that there seemed to be a difficulty on the soil for the crowds of trees and little saplings to find room to grow. At the foot of the steep hill on which the Indian's hut stood, a small piece of flat land, by the side of the stream, was thickly planted with sugar canes. We gathered some tobacco seed which was ripening on stalks nine feet high. The Indian was a Quichua; his only comfort appeared to be in chewing coca, and his only companions three tamed turkey hens. His house was well built, the sides being open work, and roof well thatched with wild palm leaf. A stick of wood with notches leaned in one corner towards the loft. This was his stairway. As we sling our hamacs in the lower story, the old man went up to bed. I told José to inquire why he slept up there, and we found he was in the habit of doing so not to be at home to the tigers, who troubled him by repeated and unwelcome visits during the night. He had no objection to their calling in the day time, as then he was ready to trade saltpetre and lead for a tiger's skin, which became valuable at the Pacific coast.

Looking down the ravine we saw the Espiritu Santo descending with the land, thickly coated in green. The forest trees are not so large as we expected them; none of them are equal to the oaks of North America. The old Indian pointed out the cinchona leaf on the opposite side of the ravine, but said there were few trees in his neighborhood, that the bark gatherers entered the woods farther towards the northwest of us.

The descent here is not near so precipitous as to the east of Cuzco, though the difference in height between it and the last ridges we crossed was very small. The road near the Espiritu Santo is over ridges of hills which run parallel with the range of mountains, decreasing as we descend. We rise up a short distance, and then descend on the long side, like a boat forcing its way seaward through the rollers of the coast, which, as they approach the land, become mere breakers. We passed a comfortable night in the hut, which protected us from heavy rains accompanied with lightning.

Farther down, at a settlement called Espiritu Santo, about one hundred creoles were cultivating land on both sides of a ravine, which widens as we descend. They were clearing coca patches of weeds; looked ghastly, thin, sallow, and distressed. The climate did not agree with them. I never saw so miserably weak, broken down a caste of men. The women looked more healthy, but there were few of them.

The coca plants were small and unthrifty; the moss gathered about their trunks gave them the appearance of trees placed in uncongenial

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climate and soil. The patches looked beautiful on the distant sides of the hills; rows were planted on steps formed by little stone walls one foot high, one above the other, with a platform to plant the trees upon of a foot and a half in width. The place was too wet and cool, and the soil not sandy enough. The Indians say the Yungas coca is better than this of Yuracares, and that of Cuzco a superior quality to either. The coca tree of Cuzco is larger; these grow on an average four feet in height and produce fewer leaves. Near Cuzco the trees are planted in a flat country, where the climate is warmer, more regular and not so damp. There the mats on which the leaves are dried are spread on dry ground flats. Here a pavement built of stone is walled in with an opening on two sides, so that when it rains the water may pass through, and wash off the pavements placed below the surface of the ground for the purpose of protecting them from sudden gusts of wind that come down and sweep away the whole crop, the more easily after the leaves are dried. In the lowlands of Cuzco the winds are not so violent, and the coca grower may tell when a storm is approaching and carry his leaves under shelter. The air is dry enough there even when it rains not to injure the leaf, while here the atmosphere is so damp that the coca curer must carefully secure his leaves against it, or they lose their flavor, diminishing their market value. The Yuracares coca planter is too high up on the side of the Andes. If he would condescend a little, he probably could find as congenial a climate and soil as those in the lowlands of Cuzco. In Espiritu Santo there are several patches which have run out; they are constantly planting new crops, which show that the tree is short lived.

The coca is a great favorite of the Quichua Indian; he prizes it as the Chinaman does his opium. While the one puts to sleep, the other keeps awake. The Indian brain being excited by coca, he travels a long distance without feeling fatigue, while he has plenty of coca, he cares little for food. Therefore, after a journey he is worn out. In the city of Cuzco, where the Indians masticate the best quality of coca, they use it to excess. Their physical condition, compared with those who live far off from the coca market, in a climate equally inhospitable, is thin, weak, and sickly; less cheerful, and not so good looking. The chewers also use more brandy and less tamborine and fiddle; seldom dance or sing. Their expression of face is doleful, made hideous by green streaks of juice streaming from each corner of the mouth.

The coca leaf has a very bitter taste to those unaccustomed to it. The Indians chew it with a little slacked lime, which they think eases its way down, and makes it sweeter.

The Incas employed the coca leaf, and it is said introduced it into their church worship. Great attention was paid to its cultivation. They were careful in the choice of land, descending to the eastward of Cuzco, until they found the proper soil and climate.

The Indians have a curious custom with regard to the coca. After the ball in the mouth has lost all its flavor, they throw it against a rock. Along the narrow roads on the Andes, where the rocks stand out in the way, we have noticed their faces besmeared with the coca leaf after it had undergone a thorough mastication.

The men tell me they gather a crop of coca leaves every three months; sometimes the season fluctuates. As soon as the trees are stripped of their leaves, fresh ones sprout out again during the lifetime of the bush, which in the montaña of Cuzco outlives a man.

Among the workmen was a negro, and I never beheld a more cheerful face in any of his race. When he saw us, he grinned till it attracted our attention particularly to him. He was fat and hearty; his black skin had a clear, ebony color, while his teeth were so white and lips so red, it was plain to see he had no partiality for coca. He was excessively polite in getting us seeds from the plant, fetching us water and oranges. We are among fruits and flowers now—a congenial climate for the black man. His wool was curled in most glossy locks and his heels projecting. He was dressed in a white jacket and trousers, straw hat, but without a shirt.

The creoles chewed coca and smoked tobacco. The negro luxuriated upon oranges and bananas, which he guards from the ring-tailed monkeys, who fancy the same food. This was his only annoyance, for he naturally sides with the white man.

Of the three colors of men, the cold country suits the red, the hot the black, and the temperate the white. On the steppes of Cochabamba the white man flourishes best. In the snowy regions the Indians seem to be less sensitive to cold; while in the heat of the tropical sun the black shows his teeth to most advantage.

Crossing the Espiritu Santo, we encamped on the chocolate plantation, Minas Mayo, near the bank of a stream of the same name. We had to wade; the current was not very rapid, but with some danger of losing our baggage, for the bottom was filled with round slippery stones, whith made it difficult for the mules to keep their feet.

The family on this plantation were gathering coffee in bags slung by a strap round the neck, like the Brazilians gather it. The coffee-trees here are about the same size as those of Rio Janeiro, and loaded down with grains. There were only a few trees; the amount raised is suffi-

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cient for the consumption of the people in the neighborhood. The chocolate-trees are larger than those of Northern Brazil, and seem to be well supplied with a plentiful crop of green nuts. Plantain and papaya trees stand thick about a wooden house thatched with palm leaves. While I was sketching, Don Cornelio looked on, with a sugar-cane stalk in one hand and a long knife in the other. He cut off large mouthfuls which swelled out his cheek. A Yuracares Indian stood by who had overtaken us on his return from Cochabamba. The frock he wore was the uniform established among the Indians by the Jesuits. It is of white cotton cloth, after the fashion of a dress made by the savages from the bark of certain trees. When this Indian and his companion first arrived on the top of the mountains, they suffered much from cold. They doubled their "camisas," but the winds whistled about their legs so freshly they say they were taken sick. When they had delivered their despatches to the Bishop of Cochabamba, from a padre in their country, they hid away in the warmest ravine they could find, and remained there several days waiting clerical orders. As soon as they received permission to return, they scampered back to warm weather as fast as they could. They left Cochabamba after us. We have not delayed a day, so that they have travelled faster than our mules. On these terrible roads the Indian moves up or down at a steady pace, while the mule stops to blow and to rest.

The poor Indians had brought nothing to eat on the road, and the first thing they seized here was the sugar-cane. We gave them some provisions. They cannot bear the coca, and laugh when they see the Quichuas poking green leaves into their mouths. They were examining their bows and arrows to be ready for game and for fish, which they said were plenty farther down the country. We gave them fish-hooks they were delighted to get, and promised if we overtook them in the morning, they would shoot us a turkey or some fish. After they slept for a few hours, Cornelio says they rose up and travelled at midnight, single file, by the path we afterwards followed by the light of day.

Their forms are straight and well made, but they were not strong men. The expression of face was feminine. They looked bleached by the side of a Quichua Indian, who was much stouter built. Their hair is worn long, like the Quichua and Aymaras, wearing it in a long trail behind. The Yuracares had rather a pleasant face, but not a very bright eye. Besides his knife, he carried a cane fife, showing a taste for music; and from the variety in a bark camisa, he certainly is fond of fancy colors, which he procures from the dye-woods of the province. His bows and arrows were the same as the Indians use in California;

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YURACARES PLANTATION

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both long. Those designed to shoot fish were beautifully made and fitted; the points or heads of hard black wood; the arrow a reed, with colored feathers.

José is again at a loss to understand the Indian language, so we make use of Cornelio, who is an old friend among these people, and seems to be popular. They see him often on the road which passes through their hunting grounds. The cap the Indian wears upon his head, Cornelio says, was purchased in Cochabamba, Indian like, instead of buying corn for the road.

Maize and yuca serve the men here as bread. Coffee, chocolate, and sugar are their groceries; beans and pepper their vegetables; oranges, papayas, plantains, and bananas, their fruits. The creole is constantly pulling at the tobacco-leaf to roll up in a corn-husk as a cigar. He imports rice, and flour when he can get it; gunpowder, shot, fish-hooks and lines.

This coca business is superintended by a person who employs men from the valley of Cochabamba, willing to seek their fortunes in the wilderness at the rate of twenty-five cents a day. One of the workmen was kind enough to swing my hamac under a shed; he and a companion slept in a bed close by. The contents of a pot were puffing up; the man ran through the dark to its relief; taking the pot from off two stones, he politely invited me to join them at supper. Our light was from the burning chunks of wood, and a hungry dog kept watch around us, and barked when he heard a noise in the woods. The employer of this hospitable man paid him fifteen dollars per annum; clothed him in coarse cotton, lodged him under a shed, and we found his supper of rice very good. Our host was a mestizo, from the town of Sacaba, in the valley of Cochabamba. He expressed great desire to return home. "The climate is more agreeable," he said; "there is less sickness, and there we have nothing to do. The life is a gay one; we play upon the guitar, dance, and sing with the girls, and live an easy life. The girls won't come down here for fear of los animales (wild beasts). We get no mutton for our chupe. Ah, Señor! above all, we never see a cup of chicha; but with hoe in hand, we go to the coca patch at sunrise in the morning, and there remain during the day, only leaving it in case of a heavy rain."

We tried to convince this honest laborer he was doing a better work for his children and his country by cultivating coffee, chocolate, and sugar, than by dancing, music, and drinking chicha. He laughingly shook his head, and said, "the children must take care of themselves as I have done; and as to the country, we are yet without law in Espiritu

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Santo, except the law of our Catholic church, which exacts of us an annual contribution, which has to be deducted from fifteen dollars a year."

The Espiritu Santo is joined by a smaller stream, Minas Mayo. The two form the river Paracti, which being the main branch of several tributaries on the opposite side, presents quite a formidable stream of seventy yards wide. Its greenish waters flow more sedately, less rapidly, and through a country with less declination than some others. At the head of Paracti the thermometer stood at 73° fahrenheit, and the temperature of the river water, 70°. The small lakes on the ridge have a temperature of 59°, and as we are now at the base of the ridge, we note the difference, 11° fahrenheit. The waters which flow down the sides of the Andes in the dry seasons are partly from the melted snow, having undergone the process of freezing into glaciers, which melt again, and the waters form small lakes near by. As these lakes fill up, the water overflows either on the one side or the other, sometimes on both; if the latter, and the lake be upon the highest ridge of the great range of Cordilleras, that which flows over the west side of the lake is a tributary to the Pacific ocean, and that which comes to the eastward goes to the Atlantic. The main branch to the Mamoré river does not become navigable for canoes until it turns towards the north, and has come fairly under the rain belt, which pours down heavily to latitude 17° south. The navigation of that stream is marked by this edge of the rainy region so plainly, that the river Piray, which is a tributary of the Mamoré and close by it, may be descended in a canoe from Puerto de Jeres, while the main stream throughout its length, south of latitude 17°, is passed on bridges or forded.

On the side of the Paracti the hills are small, and our road during the day's travel is often over flats or slopes, for we are still descending over what may be termed the great breast of the Andes, which swells out magnificently towards the morning sun to the delightful tropical breezes that blow over its productive soil.

Our train of mules are much harassed climbing over the hills, on the east side, one of them, exhausted, lost his footing and rolled over, baggage and all.

We encamped by the side of the Paracti in the wilderness; not a house near us. We passed our acquaintances, the Yuracares Indians, on the road. They marched slowly along, with bows and arrows in hand, dressed in their bark shirts, bare-headed and footed; true wild men of the woods. They had no fish or game. Cornelio said they were treated so well by us they would not exert themselves to hunt,

but as soon as they felt hungry, would get fish from the river or turkeys from the woods.

We slung our hamacs between two trees, a fire was made, our mules were turned out in the woods to roam, picking up whatever they might find, under charge of the old white mare, "the mother," as she is called, of the train. Rice is boiling without turkey. The moist climate has affected the gun-caps. Cornelio begins to look thin and haggard. The mules have fallen away so much, it is very doubtful if they will be in fit condition to return.

After supper we lay down to sleep in the rain. The noise of the neighboring stream was musical. We felt we should make headway when once launched upon the river. Though roughly used, our health keeps good, and every day we gain a little. The farther we go the slower the animals move; they are too weak to bear pushing. The men help them up steep places by the after-part of the baggage, changing cargoes every day. The mule that carried a heavy load to-day takes a lighter one to-morrow. Our saddle-mules do better, as they carry a living man with more ease than dead boxes. One of the baggage-mules ran under a tree fallen across the road, struck the end of the box of instruments and knocked it off, and away it rolled down the bank.

The musquitoes bothered us during the night, and the vampire bats bit the mules. One struck Mamoré on the tail, and another Pinto—an arriero—on the big toe.

At the head of the Paracti, we find birds of beautiful plumage. As soon as we come where fish are found in the streams, there the woods are filled with birds; the air with musquitoes and flies. Ants and bees are more numerous, as well as wild animals. The wild Indians do not permanently reside here; they only come on hunting occasions for fish and game in the woods. The wild duck is seldom found above where the fish reach. The different species of animals seem to be joyously feeding on each other. One bird robs another of its eggs, while a third carries off the young of the second. One bird feeds upon the berries of the trees, and prepares himself as food for another of greater strength. Some fowls feed upon the fish of the river, while the snake is busy entrapping their mates. Bees make honey, and the bears eat it. While the arriero preys upon the ring-tailed monkey, the vampire bat sucks the blood from his toe or his dog's tail. The ants are disturbed by our fire; the whole race seems to be in a rage; and while the Indian can travel all day without shoes, these insects crawl into our boots and sting us most unmercifully.

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May 20, 1852.—At 5 p. m., thermometer, 78°; wet bulb, 74°; cloudy and calm. As we reached the foot of a hill, we met a train of mules ascending with a cargo of cacao. The animals were miserably poor. They had carried down salt and foreign dry-goods. One of the arrieros unloaded a mule to get at a bundle of straw-hats, one of which he wanted to sell to Richards. When they called to the train to go on, it was with difficulty the animals were assisted to rise, who had laid down under their loads.

As we quietly wind our way through a flat country, the lofty tree-tops are thickly habited by the monkey tribe. One of our baggage-mules became entangled in a creeper. The animal was wound up in it. It struggled with all its might, became frightened, stripped itself of the baggage, and applying all its strength, down came the whole tree over our heads. The branches switched the poor mule severely. It looked almost distracted, and so much wound up that no one could understand the ropes. The only way by which the arriero could extricate it was by cutting the creepers on both sides of the mule, who looked as if within the turns of a serpent hanging from a limb, and winding himself round the body of the animal. The tree by which we were standing protected us. The falling one was caught in its descent, so that we escaped a severe whipping, if nothing worse.

Cornelio was ahead, and halted while the baggage-mules passed by. When we came up, we found him shaking hands with five most wild and savage-looking men. Their faces were painted in stripes of red, green, and blue, which gave them the appearance of being tattooed. Their hair was short; dirty bark cloths were suspended round their waists. The feet, legs, breasts, arms, and heads were bare. In their left hands they carried bows and arrows; in a belt a long knife of English manufacture. Their teeth were much worn and dirty. They had holes in their ears and noses, but no ornaments in them. They were middle-sized men, stoutly built, but lazy looking. Their natural color was concealed by dirt and paint. We were unable to tell, upon so short acquaintance, what it was. Their eyes were blood-shot, and their general appearance showed to most advantage when viewed from amongst friends. Each one came up and shook hands in an awkward manner that plainly showed the habit was not natural. They smiled, however, and quickly asked for bread, fish-hooks, and knives. Cornelio told them to bring us game and fish to the next stopping-place, and when we unloaded our mules he would have something for them. They at present received bread and ate it up greedily. Rose started at a noise in the woods, and on looking round, we beheld three more younger Indians

and one woman. She carried an earthen pot slung to her back, and was dressed like the men. Her head was large, nose flat, and altogether such a hideous being, I shall not pretend fully to describe her. She was small, and appeared like a child by the young men, who were better looking, and with more pleasing expression of face than either of the others; they were less painted, and carried smaller sized weapons. This party of Indians were of the Yuracares tribe on a hunting excursion. They roam through the woods and along the streams seeking food. The woman accompanies them as cook and help; she carries their game, and acts as the servant of these savage men, following them in the hunt with the old smoked earthen pot hanging to her back. When a turkey falls, or a fish is drawn from the river, or the tiger-skin is taken, they are tossed to the woman, who lugs them along with her pot until they encamp for the night, when she builds a fire, cooks the game, and all seat themselves in a ring and feast, after starving a day and a half. Should it rain, a few large green leaves are spread upon some branches of bushes, sloped on the weather side of a ridge-pole, supported by two forked stakes. The ground underneath is bedded with more green leaves from the forest; the seven men and one woman retire for the night, with their feet towards the fire, which is a protection against musquitoes and bats. When rain falls at night the air is cold, and these wild men are kept warm sleeping close to one another. In the morning, before the break of day, they are all on their feet; not a word is spoken; a death-like silence pervades before the waking up of other animals. The moment the ring-tailed monkey opens his eyes and gapes after his night's rest, the watchful Indian draws his bow; the screaming monkey falls to the ground pierced by an arrow; he twists, turns, and calls for help from his fellows; the Indians stand perfectly still, knowing that the curious family will rush to the rescue, and, as they one by one crawl down to see what the matter is, the arrows fly silently through the trees, when the screaming is terrible. The wild turkey, however, is not disturbed, for the racket made by the monkey family is only a little louder than usual at that hour of the morning, and as he shakes the dew from his wings before he flies from his roosting-place, the well-aimed arrow brings him to the ground. Tigers that roam about for their breakfast, scent the Indian's resting-place by the gentle breezes that blow from it; they growlingly approach the rude habitation, but the arrow meets him, strikes inside his fore-shoulder, penetrates his heart; his claws tear the earth, and his teeth clench the slender arrow in his dying agony.

As the sun shines brightly upon the happy waters of the river, the fish begin to jump and play. The Indian takes his stand on the rocks

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in the stream, and with an eye that seems to penetrate the depths, shoots; his arrow is drawn up with a breakfast for one, sometimes a foot in length.

As the Indians do not inhabit this region, the game is undisturbed, except on rare occasions. The animals increase and multiply without being frightened by the sound of a rifle or the noise of a shot-gun, except when the white man appears.

The Yuracares Indians are half-civilized, or, more properly speaking, are half friendly to the white man. We may pass among them without danger. The creoles are careful to treat them kindly, well knowing they would silently draw their bow-strings if they did otherwise. Cornelio was exceedingly polite; gave them part of what they asked for, and promised more when they brought us game, which appeared reasonable to them, so they came anxiously after us. We were equally as polite. I was obliged to be unusually particular, as one of them inquired after the health of the "Patron." After they had looked at us, it was plain they distinguished a difference between us and the Spanish race. One turned to the other and quickly disclosed his discovery. They then drew near to examine the North Americans. When Richards remarked "We were among the savages at last," they all laughed and talked among themselves in quick succession. They examined our boots and gloves; pointed to my stirrups, which were English, and differed from those used in the country, which are formed of painted blocks of wood, with a hole cut in one side to slip the foot into and protect the toes against rocks. The creoles prefer this stirrup because it provides against rain and mud; but they are clumsy, particularly in the woods, where they are constantly catching in the trees and bushes, that I do not think them an improvement. The mountain saddles with high backs and pommels are indispensably necessary on the eastern slope of the Andes; but on the table-lands and along the roads, among the Cordillera, the plain saddle is more confortable, though probably it is not so safe. Cornelio uses nothing but his bedding, over which he slings his saddle-bags attached to a strap, with two great wooden blocks slung to each end, and a crupper to which he often turns and holds on as the mule jumps down a steep place in the road to the risk of the animal's tail.

On the evening of the 21st of May, we sat straight in the saddle, the mules walked leisurely along over a level road to the bank of the beautiful river San Mateo, flowing swiftly to the northward to join its sister, the Paracti, which runs east. The stream was from sixty to seventy yards wide, with an extended rocky bed, which shows that during the rainy season it is a large one, though less rapid than the Paracti.

The Indian lives by the side of the San Mateo. Brighter days and clearer nights are found here. The soil is rich, the country undulating. The Indian has an uninterrupted view of the valley of the San Mateo, until his eye strikes the Andes.

We halted at a place called San Antonio, composed of a single shed, very neatly built and thatched. Our hamacs were slung up and baggage put under cover. We bathed in the waters of the stream, and were refreshed by our suppers. We felt grateful we had crossed all the mountains in safety, as we look up at their heads among the clouds.

The evening is like that of spring. As we found everlasting winter on top, so perpetual summer is here. The flats are covered with a growth of forest trees, besides which there are cane-brakes, bamboo, and coarse grasses, sappy bushes, and plants that prove the soil to be of the richest kind. This is the place for the axe, the plough, and the hoe. The axe has never touched one of the trees, except when the Indian wanted its coat. The face of the country is a true picture of nature. The hand of civilization has not yet touched it, though probably it contains a soil and a climate that would produce as well as the richest spot known, and would astonish the planter, not only by an enormous yield, but encourage him in planting a variety yet unexampled.

A log canoe lay fastened to a stone near the bank of the San Mateo. This is the first *wooden* vessel we have seen since we left the steamship "Bolivia" at Callao, begging pardon of the wooden spoons, plates, stirrups, and other ware along the route.

Cornelio has unpacked a small bale of cotton goods, and is measuring off several yards of white cotton cloth for four Yuracares Indians' pay in advance for their services in the morning in helping us cross the river. The trade is interesting; the Indians have thrown down their bows and arrows in confusion, and stand watching with eager eyes the unrolling of colored cotton handkerchiefs, knives, needles, &c. When they see the fish-hooks there is a shout of joy. They crowd so close round old Cornelio that he has great difficulty to keep the savages from trying on all the colored cotton caps he has brought. These Indians have no gold ornaments to trade for what strikes their fancy; they are nearly distracted with desire to get what they see. They own nothing but bows and arrows, a little yuca, and a few ears of corn to offer in exchange. Animal food is so plentiful here that they are not obliged to cultivate the soil, however productive it may be.

The province of Yuracares belongs to the department of Beni. It comprises the sides of the ridge from head to foot, and therefore within its borders the climates are cold, temperate, warm, and hot. Gold is

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reported to have been found in its streams, though we were unsuccessfull, after washing all the way down from the top. We did not see the people gathering cinchona bark, prohibited by a decree of the government. Few of these trees are on our way down, yet we saw trains of mules loaded with bark crossing the Andes on their way to the Pacific, and workmen packing it up in bales in the bank at Cochabamba. Unless a different system is followed in the gathering, this valuable article of trade will be lost. The lands wooded with cinchona trees belong to the government. Private individuals have no control over the preservation of these parts of the forest. All who desire to gather may do so; this is a destructive plan. Every man in the country has an interest in the trade; yet, those who reap the greatest benefit by it, destroy every tree they meet, chopping it down, and stripping every inch of bark from its trunk and limbs.

CHAPTER VIII.

Cinchona forest—Indians shooting fish—Department of the Beni—Vinchuta—Small pox—Canichanas boat's crew—Cotton cloth and silver coins—Our faithful servant José Casses and the mules—Trade at Vinchuta—A night on Coni creek—Embarkation at the base of the Andes—Chapare river—Canoe life—Floods—Bark cloth—Pick up the sick—Indians at prayers in the wilderness—Lassoing an alligator.

The cinchona trees of Bolivia are found in that boisterous uninhabited region on the east side of the Andes which we have just passed through, in a sort of belt all along the side of the mountains, stretching from about half-way down to the feet of the Andes; a beautiful green skirt, which clothes these lofty mountains and protects their nakedness from the heavy east winds and beating rains. The general impression on the other side of this valuable forest is, that the cinchona tree may be found many miles to the eastward of where the bark gatherer has penetrated. This is not so; probably most of them have touched the lowest edge of this rich dress. On the road to the head of the Madre-de-Dios, in Cuzco, I passed beyond where the bark gatherers went, and Leechler, who made his living by collecting bark, was constantly saying to me, after we got fairly down into the bottom of the Amazon basin, "I see no cinchona trees, sir, and I am looking out for my fortune down here." When we returned to the boisterous region, there he was calling my attention to the shining leaf, clearly distinguished from the other foliage.

The impression in Bolivia is that the Yungas forest is giving out, and the bark gatherers are turning their attention to the Yuracares forests. There is no doubt that the forests of Yungas have been nearly stripped of this valuable tree. The only way to save the cinchona tree is to take the bark off in strips, so that the tree will cover itself again, and then the supply will be constant. The decree issued by the government, prohibiting the cutting of bark for the next three years, is no remedy. The forest does not become enriched by a new growth of trees in that time. It requires a man's life, and probably more, for the cinchona tree to become of full size, and after the first growth is cut down that species of tree may be forever lost to the land where it was originally found in such abundance. The cinchona tree requires care and protection.

At daylight in the morning twelve or fourteen Indians came to San Antonio's shed to see us. Three of them were on their way to a lake

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for fish. While the mules were loading for the ferry I accompanied the three savages. As we walked along they asked me all sorts of questions, none of which I could understand. When they saw a bird they called my attention to it, and made signs for my gun to shoot. They seemed to admire my gun as much as I did their bows and arrows. I drew from my belt one of Colt's revolvers and showed the number of balls it carried. By way of trying one of them, I offered it to him; he shook his head, no; patting his hand on his arrows, as much as to say he admired his own invention the best. As we neared the fishing place they quickened their pace and walked single file, like soldiers marching up to a fortification. The lake was small and deep, with water so clear that the bottom was plainly to be seen. The stream that fed it ran off the side of a hill, thickly wooded. Long stakes had been driven into the muddy bottom, and to the heads, which stick out of water, poles were fastened by means of creepers, so that the Indians could walk out upon a platform just above the surface of the water. As they did so they arranged their black spears, which were about twelve feet long, and silently watched on the bottom, one at each end of the lake and one in the middle. Their arrows were pointed down into the water; when one fired and missed there was a general shout of laughter, and he good naturedly talked to them and to the fish as he caught the arrow when it rebounded to the surface, between the bow and its string, a stout cord, neatly twisted, made of white cotton. The next one that shot caught his arrow in the same way, which was shaking with a heavy fish, a foot in length. He killed it by sticking his knife into the back of its head, took out the arrow, and threw the fish on the shore. Turning up the point of his weapon he sharpened it with his knife, and made ready the second time. The knife was fastened to a string suspended round the neck; after using it, he threw it over his shoulder, where it hung on his back out of his way till the next fish was caught. The knife looked like a table knife broken square off, and sharpened at the end like a chisel, and was used as such, not like a common knife.

As the fish were thrown out one after the other, in quick succession, the excitement became very great; they chatted and laughed all the while, and appeared to be joking one another. Their faces brightened pleasantly as they drew out the fish, and whenever one of them missed, they all shouted in loud laughter. Each man shot five fine fish, and one of them one more. They then repaired their fishing scaffold and left the lake. After we had returned some distance they stopped, cut fresh green leaves from a sort of cabbage plant, and rolled them one by one therein, after their entrails had been taken out. One of them made

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By Lieutt L. Gibbon U.S.N.

Lith. of P.S.Duval & Cº Phlª

YURACARES INDIANS, SHOOTING FISH.

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a little willow hand basket in a moment, and the game was secured from the heat of the sun, which by this time was shining down brightly. A part of their morning's labor was presented to me. I returned fish-hooks, which pleased them more than anything that could be given to them. A little aboriginal came for the fish, and while he took them home to the women, the Indians went with us to the ferry.

These Indians are much more cheerful than those on the mountains. They have a great fancy for bright colors, and live after their own fashion. Their manners and customs are their own, and have never been changed by the influence of the white man. Like the country they live in, they are as the God of nature made them. Their natural disposition is a peaceful one, with a decided character, which shows that the Spaniards may come among them and live with them if they please. But the happy life of the hunter is not to be given up for the more laborious work of cultivating coca patches.

These Indians occupy about the same district of country here that the savage and unfriendly Chunchos do in Peru, on the tributaries of the Madre-de-Dios; but have a different expression of face, now that we know them better. They are more manly in deportment than the Chunchos, who are described to crawl through the woods with wilful determination of assassins.

They loaded the canoe with our baggage, and in a smooth place in the San Mateo, below a very rapid fall, paddled across. By several trips, they safely carried all our boxes over, and then swam the mules. One of them led the old white mare into the stream; the mules followed; the Indians dashed in after them, and the train swam to the opposite shore. The canoe came back for us, and we embarked at the foot of the Andes on a voyage across a stream, which was not navigable, even for a canoe, except where we passed. The color of the water was milky.

We met another train of mules, loaded with cacao, on their way to Cochabamba. The Indians transported them over the same way they did us.

Our mules were so much exhausted that they stood upon the rocky beach hanging their heads. As the water dripped from their sides the hot sun dried them, and the swarms of sand-flies troubled them as much as us. Cornelio told me his animals could not proceed—they were nearly worn out; so that we had to spend the day on the bank of the river, while the mules roamed into the woods and along the wide flat, which overflows in the rainy season.

The department of the Beni is the ninth and last in Bolivia. It

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comprises the northeastern portion. This and the department of Santa Cruz are the two largest and most easterly parts of the country. They stretch from the Andes to the Brazilian territory.

The great Beni river, which rises among the mountains of La Paz; the Mamoré, from the department of Cochabamba; and the Itenez, whose headwaters commence in the mountains of Matto Grosso, in Brazil, all flow through the department of the Beni; yet it is the wild country of Bolivia, and probably the most wealthy of the States of this confederacy.

That part of the Beni which lies on the eastern border of Yungas is called the province of Apolobamba. The chocolate, coca, and cinchona bark from Apolobamba are superior.

The southeast trade-winds from the South Atlantic ocean meet, and are checked by the great Sorata mountains. The town of Apolobamba, on the river Tuiché, is situated half-way between the gold mines of Tipuani and Carabaya. There is no such cinchona as that known as the "calisaya" of Apolobamba. At the feet of these trees are found the richest gold mines of Bolivia; and on the other side of the mountain range are said to be the richest gold mines in South America.

The southeast trade-winds are uninterrupted, after they rise from the ocean and pass over the beautiful "Organ" mountains in sight of Rio Janeiro, until they strike the slope on which the town of Apolobamba is situated.

The same wind that propels the sailor from the equator towards Cape Horn, on the South Atlantic ocean, on his way for the Peruvian bark, carries the moisture from the same ocean to give life to the trees from which the sailor receives his cargo. No man is supposed by seamen to have a right to the privileges of grumbling at the world or the winds until he has doubled Cape Horn.

Having rested our mules, we pushed on for eight leagues over a level road to the port of Vinchuta, which is composed of six sheds, or Yuracares houses, one of them two stories. As this was the governor's, we dismounted and walked up stairs. On gaining the upper floor, a young creole stepped forward and politely invited us to a seat, from which we could overlook the town. We were told that the governor and the inhabitants had deserted the place—they took fright at the small pox; and, the young man, pointing to a little Indian boy with a most ghastly stare, who was wrapped up in a poncho laying near me, said, "my servant, sir, is suffering very much with that disease, and down the country the Indians are being swept off at a terrible rate." This was not the most agreeable news, particularly as we were obliged to remain here

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By Lieut.t L. Gibbon. U.S.N.

SAN MATEO FERRY. Bolivia.

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until the governor came to his post to discharge a large canoe which was ready to leave for Trinidad, the capital of the department, and in which consisted our only way of proceeding.

A message was sent to the governor, who was at the small town of Chimoré, where the Indians had collected as a retreat from the small-pox, and where there was a padre.

Vinchuta is the point at which the traders in the cacao of the province of Mojos reach those of Cochabamba with salt. A cake of salt, cut out of the Lakes of Oruro or Potosi, brought down to Cochabamba, is worth thirty-seven and a half cents. When that cake reaches Trinidad, it is worth two dollars. A mule carries eight cakes, or six arrobas—one hundred and fifty pounds. Salt sells, therefore, in this department at a little over ten cents a pound. The freight to Vinchuta from Cochabamba is eight dollars the mule load. We have made the journey in ten days, which is about the average passage; the return train is a couple of days longer, but it has been made in ten days back.

Cacao is bought in Trinidad at from one dollar and fifty cents to two dollars and fifty cents the arroba, or twenty-five pounds. The market price in Cochabamba is usually six dollars. Chocolate may be had, then, in Trinidad at six cents a pound, while in Cochabamba it costs twenty-four.

The houses were surrounded by the primitive forest, the only land cleared being the space of ground in the centre, where there was a growth of grass showing what beautiful pasture lands these flats would make were the forests cleared away. We observed a single papaya and a few pepper plants by one of the houses. The mules were turned into the woods, and we towards our baggage for supper. As the young creole and his sick "servant" were without provisions, they appeared glad to see us.

We found the creole was a schoolmaster, going down to one of the small towns in the country, to teach young Indians Spanish. The government supports, upon a very small pay, teachers in all the towns to instruct the Indian.

The next morning the governor made his appearance, read our passports, and said there was a large canoe ready for us; that she might go off to morrow. He seemed to be an active little man and very obliging; wanted to know all the news from Cochabamba, and was constantly complaining he had nothing nice to give us, besides which he was very particular to let us know he had the roads put in fine order, as he had been ordered to do by the prefect of his department, as they knew we were coming. We found the roads at best shockingly bad.

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While he was talking, a man came in who had been to Potosi and back for the purpose of getting the governor's place, but the government refused to make a change, so the disappointed expectant governor had to present his passports to the one in office, which he seemed to dislike.

The crew of the canoe was sent for; they were fine, stout, open-countenanced, respectable-looking Indians of the "Canichanas" tribe, from a town in the province of Mojos, near the Mamoré river. These polite mannered men stood before us with straw hats in hand, dressed in a bark-cloth "camisa," listening to what the governor said to our interpreter—that the President of Bolivia wished them to take particular care of us; that we wanted to go down and look at the great rivers, and stated how many yards of white cotton cloth he would give them apiece, namely, three yards, about enough to make each a shirt. They promised to do their duty and obey my orders.

Had I known at the time what I discovered afterwards, I should have made the bargain with the men myself. It appeared that the governor paid them in cotton cloth, while I paid him in silver money. The honest laboring Indian, who was supposed to be ignorant of the act, felt the injustice and saw its wrong more clearly than he was supposed to do. One day, long after our first meeting, I happened to ask the interpreter which the Indians cared the most for, silver coin or cotton cloth, thinking of course they preferred the latter, but I found they knew how to make cotton cloth with their own hands. So little do they care for it, that the governor had every one of their canoe paddles standing up in a corner of his bed room for fear they would leave without a cargo and go home with an empty boat, after landing the chocolate which a creole sent from Trinidad.

José was to leave us here. The good old man had performed his duty in the service of the United States very faithfully. He had not heard from his wife and family for the nine months he has been with us. We engaged him as a guide, but had passed beyond his knowledge of the country before we got to Cuzco; his fluency in the Quichua language made him indispensably necessary to the expedition; he made himself so useful to our small party we shall long remember his kindness. As he was nearly 60 years of age, with a large family in the Juaja valley, in Peru, we could not persuade him to go farther with us; we shall miss him very much. I gave the old man "Bill," as Richards called his mule, to return home, in addition to his pay, and an honorable discharge, in writing, from the *naval* service of the United States.

José had two faults, more or less natural ones—he had a standing rule to get intoxicated periodically, every six months; and, when he had time, he would also slip into a gambling house and lose his month's wages in a few moments. I have often persuaded him to let me keep back his pay, and told him he should not throw it away; when he would gently answer, "Ah, señor, there are very few perfect people in this world." We became much attached to him; Richards would often say, "if we could only persuade José to go down the rivers with us, we would be certain to get through."

I also regretted to part with my faithful mule, Rose. She had carried me nearly two thousand miles over the worst roads known to the white man, without having fallen once during the whole route. This was the *third* time she had descended the eastern side of the Andes into the montaña, without injury to herself or others. When she saw danger she came to a stand-still, and never would proceed until I dismounted, and then she would often refuse to go on until some other mule went before her.

The horse may be driven into danger by the rider; with the spur a horse may be made to break his neck over a rickety mountain bridge; he is man's favorite; is stabled, fed, combed, and watered, in health; when sick he has a doctor. But the jackass will not cross a dangerous place; whip him, he hangs down his head, lays back his long ears, and lets fly both heels at whoever attempts to force him. He will turn round and bite; in this he shows a higher order of intelligence than the horse. Man beats the jack; uses him all day, and at night turns him out on the road-side to feed upon thistles, and to find drink where he can.

Rose has the characteristics of both animals. In gentleness of disposition and intelligence, she takes after her sure-footed father, the jack; in activity, beauty of form, and liveliness of spirit, after her mother, the mare, of the Argentine pampas. This cross is the only animal valuable as a beast of burden in these mountainous countries. The horse would fall or be worried to death where the mule passes with ease. Their backs are short, and therefore can carry a load better than a horse. The jackass is too slow for a long journey, but like the llama will serve the purposes of the Indian, who suits himself to the gait of those animals.

The best mules are thought to be the females; they are better tempered, work easier, carry heavier loads, and keep in good order upon less food than the male mule. The females are invariably the best saddle mules.

Vinchuta is the eastern commercial emporium of Bolivia, but foreign manufactures come down from the mountains of the country instead of up the rivers from the sea. After the cotton goods, glass ware, and

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cutlery of Europe and North America are disembarked at Cobija, they traverse the Cordilleras over rocky roads, through the desert of Atacama, the barren plains of Oruro, over the Andes, and down those terrible roads we have just travelled. After worrying and tugging for more than eight hundred miles, all of that part of the cargo not ruined by such a journey on the backs of mules, arrives at the most important commercial port this country possesses.

There is very little trading going on here, because the outlet on the one hand is such as we describe, and the people seem to be ignorant of the advantages offered to them from the Atlantic direct, instead of the round-about way of the Pacific.

But the business under these sheds in the wilderness attracts attention. We find the Aymara, Quichua, and Spanish languages mingling with the Yuracares and Canichanas; we are pleased to add the Anglo-Norman. The arriero and the canoe-men meet in friendship with each and with us.

On Tuesday, 25th May, we descended the steep bank of Coni creek, stepping into a canoe made of a log forty feet long and four feet wide. The model of this canoe appeared to us a beautiful one as she sat upon the water. She was one of the largest used by the Bolivian Indians, and the contour of the vessel resembled a model frigate more than any other. Her cargo was piled up on the bank under a rustic house built by the crew of the leaves and branches of trees. The boat-keeper was washing out the canoe; she was open fore and aft.

The creek was fifty yards wide, with a swift current. As we stood in the canoe and looked up the stream, we could see the great Andes far back among the clouds. This was to be our last view; they were nearly out of sight, and we were to enter upon a new life. José and the mules had left us. Our party was composed of Mamoré, Richards, and myself. As the crew came one by one from Vinchuta, with parts of the cargo carried on their backs, Mamoré barked; his loud voice made the wild forest ring. The crew became attached to him at once, and laughed at the fear expressed by those who came up last. We found him to be valuable, and rated him as sentinel both by night and by day.

The boat's crew was deficient. There were ten men here, four had been left along the banks of the river on their way up with the small-pox, and one of the ten was taken sick here; therefore our crew was reduced to nine working men. The sick boy lay on the bank with this horrible disease, shaded by a few green leaves from the hot sun in the day, and partly protected from the rain during the night, without medi-

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cal attention or any relief whatever. The poor creature seemed to bear the pain with patience, but his stare was sickening as he looked up from under the bushes.

Two of the crew were engaged with small iron axes cutting sticks of wood long enough to rest the ends on the inside of the canoe across the bottom, so as to leave an inch or two space under this flooring for any water to pass clear of the baggage. Five of these floorings were laid at equal distances apart, wide enough to place two trunks lengthwise, and two more on top of them, with space between for two canoemen to sit and paddle. Raw-hides were placed on the platforms, and on them the baggage was neatly laid. Our trunks and boxes stowed very well, and were covered with raw-hide. As the bottom of our boxes were water-tight, we were satisfied that unless we upset or filled, the baggage would go perfectly dry—an important matter in a wet climate under the most favorable circumstances—and more so when there is no stopping-places on the road from town to town, where the traveller can pick up a dinner.

Vines and creepers were bowed and fastened by the ends to the sides of the after-part of the canoe, and over them were spread raw-hides, hair side under, for the length of twelve feet. This was the cabin. Our gun was slung overhead, powder-flask and shot-bag to the bows. The instrument box was safely stowed inside, so that we might get at the ruled paper, and chart the river. We set our compass inside also. The floor of the cabin was a rustic grating made by one of the crew, with small straight sticks fastened to a heavy cross piece by means of a slender creeper. Our beds were kept in India-rubber bags. After getting nearly ready, we found there still remained another load of salt in the governor's house, and as night had come on and the rain began to fall, we would be detained until the next day. Then, too, the schoolmaster and the disappointed ex-governor were to take passage in the same canoe; it was their only chance like ours, and as there was no telling when another canoe would be here, all claim a right to go. Of course I could not object, under such circumstances, although they would be very much in our way, as we were about to explore a critical part of navigation on the upper waters of the Madeira.

So our tent was pitched on the bank; it had been our house on the barren mountain-tops, and now it was put up in the wild woods. There the climate was cold, and the tent protected and kept us warm. Here the climate is hot, and when the tent is closed and the canvass became wet, we found the heat oppressive. We could not sleep, so we threw open the door-way and in swarmed musquitoes. It was evident that

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the tent could not accommodate so many comfortably; we were therefore driven out. The rain-storm increased. I found my way down the clayed bank to the canoe. Richards joined the schoolmaster under the rustic hut. The musquitoes soon drove me out, and we all gathered round a large fire built by the Indians, and watched their mode of passing such a night.

A large pot of water was put on the fire. It was midnight; the wind roared through the forest trees, and the rain beat heavily at the feet of the Andes. The Indians drew knives and gathered round the light of the fire to skin the yuca. Some divided them into small pieces, and pitched them into the pot with a piece of salted meat. After the pot was properly hung over the fire by a strong raw-hide rope, they lay down under their green leaf roof, and with their feet to the hot ashes, and heads covered with an extra shirt, stretched out for a nap. One kept awake as cook to attend the boiling pot.

All slept soundly for a while. We were then disturbed by musquitoes and the rain. The Indians were snoring; the cook was talking to his pot as it boiled over, and the water caused a hissing noise in the fire. Suddenly all jumped up, leaving their bark-cloth camisas under cover, and joined the cook in the rain.

We carry a tin wash-basin, which happened to be close by in the light of the fire. I did not understand why it had not been put into the canoe with other things. One of the naked red men picked it up and placed it near the cook, who turned the hot yuca soup into the basin. A satisfactory expression shone in every face as they squatted around our tin wash-basin. Each man formed his fingers into spoon-shape, and dipped in; thus they laughingly passed the remainder of the night. One hand was actively playing between the basin and their mouths, while the other was constantly in motion flapping the musquitoes, who came up from the darkness behind. Our dog rose up from his sleeping position to look on. The men were constantly calling him by his familiar name, and dividing their share of the supper with him. We were obliged to be resigned to our fate, not knowing where to go for comfort, or how to get to sleep. These wild men accommodated themselves perfectly to circumstances. We looked on as long as we could keep our eyes open, and at last fell asleep. At day-break I found myself refreshed; but on opening my eyes, saw my pillow had been the body of the poor sick boy, who was so weak with the small-pox that we had him sent up to the governor.

These kind-hearted men pay all the attention to the sick they possibly can; but they are at a loss to know what to do for the small-pox.

They wait patiently until it passes away. I believe they think it is a punishment sent to them, and they must bear it the best way they can.

The Yuracares Indians are not navigators, but hunters, and are less under the control of the church than either the cultivators of the soil or our canoemen. I was unable to find out the number composing the Yuracares tribe, but there are not many of them. Chimoré is the capital of the province, and in the list of "villas," which are given for all places containing over three hundred inhabitants, Chimoré is not found. The Yuracares tribe are scattered along the base of the Andes in this province in little bands of from seven to twenty; and there may be in the whole province six hundred Yuracares Indians. The present productions of Yuracares are confined principally to the cinchona bark and coca.

As the streams and soils have not been carefully examined, we are ignorant of its mineral wealth. Yuracares is an extensive province, well wooded and watered, with a very sparse population throughout. At the base of this ridge of mountains appears the most inviting place we have met in Bolivia for the cultivator of the soil. It is within the rain-belt. The coffee tree of Yuracares is much more heavily loaded with grains than those seen at Rio Janeiro, in Brazil.

The small-pox was brought by the Indians of the low country, who in turn had it from Brazil, and finally bore it up the mountain-side into the city of Cochabamba.

A warehouse should be constructed in Vinchuta in the most careful way, to avoid the dampness of the climate. Flour spoils quickly, particularly that made from grain produced in a cold climate. Southern grain lasts the longest there. White cotton goods must be covered to avoid the wet, as well as all other articles which are in the least injured by damp weather. All valuable goods should be well packed in bales of seventy-five pounds weight. A mule carries half a cargo up the eastern side of the Andes. Two bales, weighing one hundred and fifty pounds, are taken at the same price three hundred are carried for on better roads.

The Indians bring up quantities of chocolate from Mojos enclosed in raw-hides. They stow four of these bails on one platform in a canoe; but when they arrive here, the arriero must rip the bales open and divide them, to form suitable loads for each of his mules. By this means, some is wasted, and all exposed to the climate.

Pieces of machinery, boxes of wine, or valuable articles, are often left behind by not being of proper weight. Even if the animals were

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strong enough to carry them, the roads are not wide enough to admit a passage.

We saw an elephant travelling on the table-lands of Bolivia, who walked through the Cordillera range of mountains at the pass of Antarangua, sixteen thousand feet above the Pacific ocean. When he came to the Apurimac suspension bridge, the tollman shut his door, and refused positively to allow the elephant to attempt to cross over, even if he could have done so. The keeper, a Yankee, swam him over the stream. There were many places on the mountains where the rocks were cut to admit a mule-load to pass, where the elephant scraped his back and sides.

Goods covered with raw-hide are preserved best from rain. It is frequently thus used to protect bark, chocolate, sugar, and coffee.

At the national convention of 1851, a grant of twelve square leagues, in the province of Yuracares, excepting the cinchona trees upon the soil, was made to Don Carlos Bridoux, upon condition that he would exert himself to raise the indigo plant, cotton, tobacco, sugar, cacao, and coffee; provided he would take possession of the land within a certain time.

By the same law, the executive was authorized to make grants to citizens or foreigners of from one to twelve square leagues, in consideration of advantages to be offered for the public benefit in working the lands. Señor Bridoux has selected his lands near the port of Vinchuta. This gentleman was very kind to the expedition in Cochabamba. We are indebted to him for personal attention at his hospitable house. We owe him many thanks for aid and assistance offered in a most generous spirit.

Citizens or foreigners wishing to cultivate the public lands of Bolivia, may do so by a formal application to the prefect of the department in which the lands are situated, and the prefect has authority, by custom, to secure to the settler one square league.

For the want of laws touching the sale of public lands, citizens or foreigners are deprived of the advantage of purchasing, but are at liberty to settle where they please, so long as they do not interfere with others, or the public treasury.

So extensive are the public lands of Bolivia, and so few emigrants enter the country, that the government has thought it policy to make liberal grants to actual settlers, as well to citizens of other countries as to their own. These valuable lands lie idle for the want of population.

The men of intelligence in Bolivia received the idea of exploring their

rivers to the Atlantic with enthusiasm. In Cochabamba the whole population have been aroused to the importance of the enterprise.

When the rivers are swollen in the low lands, the arms of the canoemen have not power to propel their vessels against the current. Trade, for half the year, stands still; human strength is not equal to the requirements of the trade that is carried on.

There are supposed to be at least ten thousand silver and gold mines abandoned in this country; one-third may have been exhausted, and the remainder have been left because the miners struck below the waterline.

Respectfully taking off our hats to the gigantic Andes, we push on in our little canoe. As the men dip their paddles in the water we glide rapidly along with the current of Coni creek. After being tossed up and down on the mountains for a year, the change is enlivening. We feel this water-carriage is put in motion by the All Powerful, in whom we have placed our trust and confidence in a long journey through the wilderness towards our homes.

The Indians suddenly began to work hard at their paddles; the fine-looking old captain talked to the crew sharply, and we went dashing over rapids at a most furious rate; the waters roared against the great trunks of trees that stuck up in the shape of snags; the logs were in constant motion, like sawyers; the channel was narrow; one little mistake of the pilot would have dashed us sideways among the snags, and our canoe must have rolled under. Every man's eyes seemed, for the moment, half a size larger, for the reduced crew of the heavy and long canoe had to exert themselves to the utmost of their strength to manage and keep her clear of danger.

Our cargo was bulky—cakes of salt brought her down so deep in the water that she moved sluggishly. Richards, seated on the baggage in front, guarded Mamoré, who was unaccustomed to the water, and it was with difficulty he could be kept from jumping overboard.

Coni creek is not navigable for a steamboat; the lands on both sides are flat and thickly wooded with a rich growth of bamboo; these lands are all overflowed in the wet season, and therefore are uninhabitable. Temperature of water, 74°. We saw a small lion or puma on the bank, besides a number of wild turkeys, and shot a wild goose. The banks break down perpendicularly with rich black surface soil one foot and a half thick.

Our canoe was soon launched into the waters of the river Chaparé, one hundred yards wide, and where we entered it twelve feet deep; we have scarcely lost sight of the Andes. The canoe was stopped that we

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might repeat the soundings; as we descended the soundings increased to two and a half fathoms upon a current of one and five-tenths of a mile per hour. The muddy stream wound its way through the forest trees and thick cane-brakes like a great slow-moving serpent. We find, at the foot of the most lofty mountains, that the lands on both sides of this navigable river are semi-annually deluged; that the rise of the waters in the wet season is about thirty feet, and by the marks on the trunks of the trees, the appearance of the undergrowth, with the information gained from the creoles and confirmed by the Indians, the banks are overflowed about two feet deep. In the rainy season, the bottom of the Madeira Plate would have been found covered with water, so that we might navigate over the land in a canoe drawing less than two feet; our canoe draws but six inches when fully loaded.

The forest trees here are not so large as higher up the country, nor is vegetation heaped up in such luxuriance as we saw it on our way down through the boisterous region. The climate is more mild and gentle in its action. As night comes on, thunder roars and lightning flashes above us towards the southwest among the mountains, while here the sky is clear, and winds gently blow from the northwest. The winds strike heavily against the great elevated side of the earth, and the storm there is raging from the southeast.

The sun passes from our view behind dark clouds, and cuts our day short by setting below the great ridge which stand between us and the Pacific. We have watched the mercury in our thermometer as it fell by the application of boiling water in ascending those mountains from the great western ocean, and saw its indisposition to rise or to fall as we travelled along on the table lands of the Titicaca basin. As we descend on this side it gradually ran up again, until now we have arrived on a level. The observation of yesterday was the same as that of to-day, at our journey's end.

Turning to the table of observations, in Lima, 22d April, 1851, at 3 p. m., boiling point, 209, 250; temperature of air, 77°. Here on the Chaparé river, May 27, 1852, at 9.30 a. m., boiling point, 209, 500; temperature of air, 75°. These show how near the bottom of the Madeira Plate is on a level with the ocean. They tell us we are below Lima; but Lima, according to our barometrical measurement, was 493 feet above sea level. On the river we are 28 feet below the general level of this part of the Madeira Plate.

The Indians paddle their canoe for a short distance with a will, and then let her ride along on the current. They lay up the paddles on the gunwale, put one leg over the handle, and drawing from among the

baggage a piece of corn husk, cut it into squares, and rolling tobacco up fine, make the husk serve as a wrapper for their cigars.

Each one carries a little spunk in the hollow end of a cow's horn, which indicate cattle ahead somewhere, and with a piece of flint rock strike light with the back of a knife. We noticed that the crew carried small bags filled with flint rocks, which they gathered about Vinchuta, and were taking down to the province of Mojos for sale. We have just passed the rocky formation, and find the soil alluvial for over thirty feet.

We camped on a low sand beach on the west side of the river. The crew gathered a number of canes from the brake, and the captain made a frame-work, over which an India-rubber poncho was hung; underneath the leaves of the cane were spread as a protection from the dampness of the soil on which the bed was laid, and over it a musquito net.

The crew made a house by stacking cane leaves and branches on the side of a ridge-pole, like farmers make a shed of corn fodder for cattle. The open side of this shed was facing the east. A fire was soon made, and our disappointed governor proved to be as good at cooking as the schoolmaster at eating chupe. The only provision the ex-governor had made was a bladder filled with what sailors call slush, a few cakes of chocolate, a pot, and some bread turned green with mould. The Indians pealed yuca, and we supplied rice and goose for the chupe, and sugar, and tin pots for the chocolote. The schoolmaster came unprovided with grub; it is presumed he was usually "boarded out."

The Indians gathered around their fire, while the captains of the boat saw the patron's bed attended to. When the chupe was made, the cook politely informed the captains, and after they had seated themselves by our tin basin, the others gathered round. All in turn talked and joked as they enjoyed their suppers. The crew elect their own captains; the most active, energetic, and intelligent man was chosen, without regard to age. Should he prove incapable, or misbehave, he is broken and placed in the seat of the paddle-man selected over him. Every man obeys his orders, and is particular in his mode of addressing the captain and his mate, or rather a second captain, who helps to steer the canoe, and generally encourages the men to keep good time with their paddles by stamping his foot upon the floor of the canoe where he stands behind the cabin. The captain only stamps his foot on particular occasions, when the crew work unusually well, laying out their whole strength when he speaks to them. The captains do very little but steer the canoe, and attend to the wants of the person who employs them. Every man attends to his duty according to the usages of their service. They take turns at cooking or bailing out the boat, and while one or two

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secure the canoe, a number of others run up to the woods and bring fuel for a fire, and cut cane for the house. While one cook fetches water, another breaks out from a platform in the canoe their provisions for supper.

As they all sat joking about the arrieros, while they smoke tobacco, they laugh at the Quichua Indians they saw at Vinchuta, with the arrieros, chewing coca leaves "like horses," as they said.

At midnight the captain called me, speaking in the Canichana language, which I could not understand, however; when a man is called up in the silence of night in such a wild country as this, he soon gains his feet.

We found that the storm on the mountains had flooded the river; the canoe floated in close to my bed, which was gathered before the flood passed over the spot, where a few moments before we were sleeping. As the river was rising very fast, we were obliged to embark or be driven into the cane brakes, which is the bed of the tigers, who growl if disturbed by gentlemen at night.

We all took our seats in the canoe and slept sitting, as well as the musquitoes would let us. The bow was made fast to the root of a tree, which was fastened to the bottom by its branches.

These Indians are very careful people, constantly on the look-out. We were aroused from a sound sleep in a moment by these watchful fellows. Had the crew been an inexperienced one, the canoe might have been carried off by the flood and we left in the canebrake. The Indians expected a freshet. In the evening they carried our cooking utensils far from the boat to the most elevated part of the beach, which was not highest near the bank. When the flood came, the water passed between us and the bank, leaving us on a sand island, which was afterwards completely overflowed.

At daylight the Indians begin at the paddles. They work best early in the mornings and in the evenings.

As we moved slowly down stream, rain began to fall; the winds were variable. Some four or five different kinds of monkeys kept up an excited chattering. An awkward, thick-set, ugly, bay-coated fellow was bellowing out a noise not unlike that made by a large bullfrog. The black ring-tailed squealed as he scampered off among the tree-tops. The little white-whiskered tribe come down close to the river-bank among the canes, and seem quizzically disposed to examine the character of the craft that intruded upon their morning sports. There goes a chocolate-colored little family, as though frightened to distraction. Richards shouts at them in English, and the Canichanas roar with

laughter. The crew desire a ring-tailed monkey for breakfast. Their bows and arrows lay on the roof of the cabin, but they prefer to see one fall by a shot from our gun.

The captain suddenly called to the men, and they all shouted. Looking down the river, we discovered two canoes well peopled, working manfully against the current close along the bank. Canoes going down keep in mid-channel, where the current is most rapid. These canoes were from Trinidad on their way to Vinchuta, with orders from the prefect of the department to report themselves to me for service in the expedition as soon as they landed their cargo of cacao, sugar, and passengers.

A basket of fine oranges was passed on board of us, the compliment being returned in biscuit. Our captain received news of some men he had left on the banks of the river with small-pox.

We pushed on by islands in the stream. Though the river is flooded, there is little or no drift-wood. Along the beach large trees have been left as the rain-belt passed north. These trees lay on the inner side of the turns in the stream. That side is a flat sand-beach, while the long or outer side of the turn breaks down perpendicularly. The current of the river strikes the bank; the drift-wood beats against the alluvial soil; undermines the forest trees; the roots are washed clean, and the tops fall down into the river; their branches sink; the heavy green leaves go to the bottom loaded with mud; become entangled or anchored. Drift-wood and rubbish collect about them; and while an island is built up on the small frame-work of one single log of wood, the bank gives way for the river to pass on.

The turns in this stream are very short. We are at one time heading northeast, then northwest, and often southwest, when we turn round northeast again. The distance between the upper and lower turns, in a north direction, is constantly decreasing; for the perpendicular bank on the upper turn is being dug away towards the north, and the same bank on the lower turn is caving in on the south side. When the work is done, the upper waters flow straight through to the lower; and as the river grows older, like a well-drilled soldier, it straightens.

The southwest turn is deserted by the waters, and the bed of the river lies uncovered, and becomes a proof to us that, while rivers travel, they do not always sleep on the same side of their bed, but shift from one to the other, as suits their convenience. The speed of the current of the river, after it has straightened itself through the land, instead of winding down, as the llama descends the side of a mountain, appears to us the same. That the older the river grows the more rapid the current

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would be a work directly in opposition to the natural purposes of navigation, for which it was intended.

As the upper country wears away, and the heavy load of earth is carried down towards the mouth of the river, the head of the stream is deepening, and being constantly cut down towards a level with the bottom, which is filling up at its mouth. This will be best explained by the sounding-line, cast from a vessel entering the mouth of a river. The pilot is taken on board to carry the ship safely over the bar, or that bank of earth which has been carried down from the head of the streams and deposited at the river's mouth. As the ship crosses this shoal, the man at the lead-line calls deeper and deeper soundings as he enters the river. He will continue to do so some distance up. From this point back to the bar, the bottom of the river is an inclined plane, sloping from the edge of the sea towards the mountains, down to the last deep soundings of the leadsman, from which place to the ocean the river may be said to be running up hill; a hill made by its own action, and which is stretching farther and farther up stream.

We find some snags and sawyers in the channel that should be cleared out to make this river in a condition for steamboat navigation.

As we descend, the Chaparé widens in some places two hundred yards, and from two and a half to three fathoms water. The river has risen three feet by rains in the up country, though the current remains about the same, which is not half the rate of the Gulf stream between the Florida reefs and the Bahama banks.

After paddling from daylight until 9 a. m. the crew were ready for breakfast. Mamoré sported over the beach. We made after ducks, geese, and wild turkeys as the only safety-valve to our boiling pot. The beautiful pink and white spoon-bill skims the insects from the surface of the river, while the proud-looking but homely tall white cranes survey us like some bodies with very stiff shirt collars. Temperature of the river water, 74°; air, 75°; and wet bulb, 74°.

We have been unfortunate at fishing. As the Indians pay no attention to it just here, we are inclined to believe there are few fish, while in the rocky formation we found the Indians pursuing them. There the water is not so muddy as here. In Lake Titicaca the most fish are found on the east side of the lake, where the water was limpid. We found more fish at the southern end of that lake when the waters were settled than at the north, where they come in turbid.

The air at night seems to be filled with musquitoes and bats; by daylight birds appear in proportion. Thousands of parrots keep the woods in a constant din.

The forest trees decrease in size and thickness; as we descend the canebrake takes their place. Some of the logs on the beach and snags in the stream are larger than those we generally see. These large trees are found in the upper forests as the exception rather than the rule.

The general course of the Chaparé is north; its bottom is sandy and muddy. There are no streams flowing into it, nor are there any appearance of beds of streams to be filled in the rainy season. We judged, therefore, the country on both sides of it, as far as we have come upon it, is a dead level.

After breakfast the men entered the woods, cut down some trees, stripped off the bark twelve or fourteen feet long and two feet wide, rolled it and brought it on board.

The common percussion lock shot-gun is the proper arm for the traveller in this country; the shot will keep him supplied with game. In case of necessity, a ball carried in the pocket can be slipped in over the shot, and answers all purposes, as the ball does execution much farther than an Indian's arrow. The most serviceable and important arms are double-barrelled shot-gun and a five-chambered revolver of Colt's.

The men pull irregularly. When they pull a moderate stroke, by our log they make about two miles per hour; but going with the current they only pull half the time, because on their upward passage they are obliged to pull incessantly, except when they stop for breakfast, or for the night. The down trip is the resting one. They work hard when they meet with obstructions, and overcome the difficulties. When they find things in their favor, they slide through them as easily as possible.

After supper they commenced manufacturing bark cloth by the light of the fire. The end of the piece of bark was laid over the end of a smoothly-barked log, and they commenced beating upon it with mallets, beginning at the corner and striking diagonally the piece to the middle, where the mallet was turned to the same angle at the other corner. They beat the bark regularly along. The fibres spread out, and the piece two feet wide was beaten out one foot more, to the thickness of stout pilot cloth. After all is beaten out, it is rolled up. The cloth is afterwards spread out in the sun to dry; the sap which has been so thoroughly pressed out from among the fibres by the beating, soon becomes dissipated by the sun, and the cloth is left with quite a woolly feel, and is painted in figures to suit the fancy of the wearer. By his own peculiar process it is cut out to form a very simple garment, and the Indian is dressed in a fancy-colored shirt, which reaches below his knees. This, with a hat of grass from the river-bank, is his wardrobe, except an

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extra shirt of foreign manufactured cotton, worn in the heat of the day when not at work, or in the evening when the musquitoes are troublesome. The bark cloth is most frequently used at night, when they particularly protect themselves. In the middle of the day they take off their clothes, carefully fold them up, and place them aside until they are required. When it rains very heavily they always undress, but as soon as the storm is over, or after the weather has been unpleasant for some time, and the air becomes cold, they dress again. They undress while at their seats in the canoe. As soon as we stop to breakfast, every man puts on his shirt before he leaves the boat; the captains always wear their clothes. The men seem to be very careful about the temperature at night. I have seen them put one shirt over another, and double their garments.

May 28, 1852.—The night was cloudy, and morning foggy. At daylight we were under weigh again, after sleeping comfortably in the woods on the bank, which varies its height from four to five feet. During the night the river rose three feet and fell again one. A short distance below we ran into a canebrake, and there, to our astonishment, stood three men belonging to this crew. The poor creatures had been here seventeen days, with the small pox. A little shelter of canes shaded them from the heat of the sun, but rain beat in upon them as they lay helpless on beds of green leaves, with no one to attend them. A knife was their only protection from the savage tiger, unless the stench from the disease kept wild animals at a distance.

Their faces brightened as they saw their friends; but there were only three. Where was the fourth, inquired the crew? Their answer was, that during the fever, in the middle of the night, he had rushed into the river; they heard a splash and never saw their companion after; he was carried down the stream by the current and drowned.

One of them was still quite sick; the others could work. Their usual seats were in the after part of the canoe, but as the odor from their bodies was great, I sent them as far forward as they could go. One of them, called the padre of the crew, became very much affronted at this order, and was disposed to disobey it, but the captain insisted, and he moved. His duties were lighter were he was sent, and there he was not so confined among us and the men. The idea of all being afflicted with the small pox in this little canoe, was an unpleasant one. We were in constant expectation of seeing some others taken sick.

The first symptoms, as described to us, were fever with pain in the back, which lasts three days. Then the breaking out commences, with inflamed lips. At the end of six days the disease has attained its height,

when the case of life or death is decided. After six days more they begin to bathe, if they are well enough. This is the course the distemper takes when the patient lies out in the woods, without medical aid or shelter from the weather.

One of them had employed himself in making a white grass hat, after the fashion of a Panama. They were delighted to get on board, and as we paddled along, the one with the new hat was telling the crew what sort of a time they had. The schoolmaster gave us the amount of what he could understand. The crew were silent while Straw Hat was speaking, but kept him going by questions when he held up. They seemed very much affected, and, one by one, gave expression to his feelings at the loss of the missing man.

At 9 a. m. we came to, as usual, for breakfast. Thermometer, 76°; wet bull, 74°. Temperature of water, 71°. The channel, as we descend, is less obstructed by drift-wood, snags, and sawyers. The banks are three feet high, the trees smaller, and the wind light from the north.

We passed an Indian slung up in a hamac between two poles stuck in a mud bank. The crew called to him, and saw the hamac move, which was our only sign that the poor creature was alive. He had been left with the small pox by one of the canoes we met. The flooded river had reached the under part of the hamac last night, and now the hot sun was shining over him. The old captain shook his head when we wanted him to go and see what could be done for the man. The crew pulled rapidly by.

The beach here is mud. On the shore of San Mateo, the beach was rocky, with large and small round stones, such as are used for paving streets. After we got below the rocky formation we found sand beaches, white and grey. The banks of the river were high. Here we have low banks, and run out of the sandy region into the mud. For the first time we saw an alligator.

The waters of a stream, as it increases from a mountain torrent to a large river, performs the labor of a system of sifters. The earth and rocks are broken away; stone, sand, and earth, are carried down the side of the Andes by the floods in the rainy season. The large stones are thrown out on the sides of the stream, as it reaches the base of the mountains, while the sand and earth pass through. Finally, the sand is separated and deposited in another place below, and the mud, in its turn, settles through and leaves the sifter clean. The water at the mouth of a muddy stream is the clearest. When river water meets the heavy salt water of the ocean, the river current comes to a stand, and it is there, while standing still, that dirt settles from water the quickest; there

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careful navigators look out for the bar across the mouth of the river as they come in from the sea.

The muddy waters of rivers seem indisposed to mingle with the salt waters of the sea, or rather the salt waters of the ocean turn the muddy waters on the one side or the other of the mouth of rivers, until they have deposited their mud, and then the clear new water cordially joins the older, briny ocean. Where a large river empties into the sea, if the current of the ocean flows parallel to the coast, and strikes the river current at a right angle, all the mud is carried with the ocean current, and is quickly placed on the bottom. By the arming on their lead, navigators may tell, at night or in a fog, on which side of the mouth of the river they are as they near the coast, provided they study the ocean currents. This is, however, not always the case. An ocean current, sweeping by the mouth of a navigable river, may not have sufficient force to be of this service to the mariner; but it is the case in a very important river on this continent. Where sand is found on the south, and mud on the north side of the outlet, the former is washed from the bottom of the sea, the latter comes down from the highlands, and is carried out by the river.

While floods are constantly shifting the soil from the mountains to the low grounds, and the land is pushed out into the sea, its waves are regularly heaving back all the earth which has gotten over the shore line. Between the currents of rivers and the waves of the sea, the earth is found growing.

We encamped for the night on the east side of the river, where the thick forest trees prevented my getting latitude by the stars. This is the first clear night we have had for a long time. I doubt, even if the branches of the trees were out of the way, if the swarms of musquitoes would allow me to observe. Richards generally stands by with a bush when the sand-flies or musquitoes are troublesome, but they bite through the holes in a man's boot in spite of his stockings.

We entered the woods some distance with the gun, just before dark, and found that as we left the river the trees became smaller, and in some cases the land was even now covered with water, long grass, and cane-brakes.

The banks of rivers that flow through a low, flat, newly-made soil, are thrown up high by deposits, so much so that the surface of the water, at times, is above the general level of the country near it. When the river rises, it breaks over the banks and floods the back lands.

The largest forest trees are found immediately on the banks; these trees are most frequently undermined and carried down stream by the

currents. It will not do to judge of the general character of a country by the size of the trees found driving out of the mouth of a river. When the first navigators on the Amazon saw great logs floating out of the mouth of the river, in whose tributaries we are, they called it "Madeira." This fact set us all looking about for the largest trees in the world, but they are not to be found here.

After supper the crew knelt by the light of the moon in prayer. "Padre" gave out a hymn, and they all sang according to the teachings of the Catholic church. The scene was a solemn one. Their voices echoed over the waters of the river, and through the woods to the listening wild beasts of the wilderness. Dressed in white cotton "camisas," they kneeled down with faces up, praying with hat in hand. We were able to look at their countenances, which were grave and serious, with an expression of truthfulness and honest devotion.

The prayers of the evening being over, the captain, a tall, well-built, noble-looking old Indian, stood up and made a speech to the others who lay upon the hairy side of raw hides on the ground. It was an obituary address of some length for the lost member of their canoe. This fine featured Indian had naturally the powers of an orator; he was fluent and spoke fast. When he reached the winding up of his harangue, he was overcome by his feelings, and speaking of the unhappy news they were called upon to convey to the mother and widow, he shed tears. His manly arm was reached out to point towards the paddle of the lost man, as the last and only token left by the father to the son.

When the captain finished, they all uttered "buenos noches" to each other, and we slept by the side of the river.

At daybreak in the morning, the monkeys began the usual chattering. We were struck at the ease with which an ugly, cheerful Indian, who looks out for snags in the bow, and is generally laying on his belly keeping watch ahead, repeated English words after Richards. The English language, the schoolmaster decided, came much more easy to these people than Spanish. "Nig," as Richards called him, was the droll one of the crew. He pronounced clearly each word as it was spoken to him; and yet this man was one of those who could not speak Spanish, generally considered the most easy to learn. The language of these Indians sounds like German. The Yuracares speak fast and constantly, like the French. The Aymara has the sound of English more than any. The Quichua, both in tone and notes of the words corresponds to the Welsh or Irish, which I have heard spoken.

The Indians beached the canoe, and for the first time had a general bath. As we passed a cross standing on the bank, the crew took off

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their hats; this was out of respect for a friend who had been buried there. We passed several of these wooden crosses; near some of them plantain trees were growing.

The wind is very light, and generally from the north; the current of air seems to follow the bed of the river up-stream. The river widens to two hundred and fifty yards. We find the current by holding on to the end of a snag in mid-channel while we heave the current log. We have no anchor and chain.

The Indians look on with some astonishment at our work; and as Richards was drawing in his sounding-line, with a two-pound lead upon it, "Padre" very knowingly informed him it was useless to attempt to catch fish in that way in the Chaparé? We were sorry to find the "Padre" was the ill-natured one, and frequently quarrelled with the men during the day. He spoke Spanish, and always addressed us in that language. The schoolmaster said, when an Indian became the leading man in religious pretension, he invariably was quarrelsome and overbearing in his manners towards others, who seem to treat him with contempt, except when called upon for ceremonial formalities.

We had seen cattle lassoed on the pampas of Buenos Ayres, and boys in Mexico practise the art upon chickens, but to-day "Nig," our bowman, gave us a treat.

A good sized alligator lay by the mud beach, with his head just on the surface of the water. The canoe was run into the canebrake some fifty yards below. One man cut a long cane, while "Nig," modestly smiling, with eyes shut and mouth open, drew a hide rope from under part of the baggage. Making a noose in one end, he hung it on the end of the pole, and wound the rope round to the other end, so that he could grasp both pole and rope in one hand. He pulled off his camisa, lowered himself into the river, where he could walk on the bottom with his chin just out of water. The noose was carried by the pole near the surface, and "Nig" slowly moved towards the alligator, who seemed to be somewhat doubtful of results. After watching "Nig's" eye for a while, he disappeared; by the motion of the water it was evident he was swimming away. The men laughed, but "Nig" stood perfectly still; the stream rolled on in silence. In a moment the alligator's head appeared again nearly in the same place, only he held it higher, as he attentively looked "Nig" full in the face. He moved slowly and steadily towards the monster of the river, and put the noose over the alligator's head; when he jumped, it looked as though he wanted to jump through the noose. "Nig" let go the pole, and in doing so lost the line also; and while the alligator swam off with one end of the rope, "Nig"

swam after his end, to the great amusement of our party. "Nig" reached the line, and putting it over his shoulder walked up the beach. As the alligator was led to the edge of the water, "Nig" stood grinning at one end of the line on shore, while the alligator lay quietly awaiting a ball from my gun or a stroke from the hatchet in the hand of a man. But we were disappointed; "Nig" had no weight to sling to the under part of the noose to keep it under water, so when the alligator jumped he caught the noose in his mouth, and while "Nig" was grinning, his eyes closed with delight, the alligator cut the rope and swam away.

There are parts of the alligator near the back bone which the Indians eat. This is the only manner in which they take alligators here; their arrows will not enter the scales, which often turn a rifle ball. I have seen a boat's crew in Mexico fire a volley of musket balls into an alligator and not kill him. The alligators here are much smaller than those found on the rivers in Tobasco. The Indians make buttons, beads, fancy birds, and animals, of their teeth.

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CHAPTER IX.

Pass the mouth of Chimoré river—White cranes—Rio Mamoré—Woodbridge's Atlas—Night watch—"Masi" guard-house—Pampas—Ant-houses—Cattle—Religion—Sugar-cane—Fishing party of Mojos Indians—River Ybaré—Pampas of Mojos—Pasture lands—City of Trinidad—Prefect—Housed in Mojos—Don Antonio de Barras Cordoza—Population of the Beni—Cotton manufactures—Productions—Trade—Don Antonio's Amazonian boats—Jesuits—Languages—Natural intelligence of the aborigines—Paintings—Cargoes of foreign goods in the plaza.

We ran down the river by the light of the moon; sounding in from three and a half fathoms to four; half the crew pulled at a time, until we passed the mouth of the Chimoré river, which empties into the Chaparé from the south. We were obliged to come to as the morning became cloudy and dark, which made it unsafe for us to pass through the drift wood flowing from the Chimoré.

Canoes ascend the Chimoré in the rainy season to the town. Near its mouth, the river resembles the Chaparé in width, color of water, and swiftness of current; but, from what I can learn, the Chaparé is the largest stream, and deeper at the head.

The rains have been to the southeast; therefore we find more drift-wood coming out of the Chimoré than we have in the Chaparé.

The country at their junction is all low, uninhabited, and unfinished. The current of the Chaparé continues the same below the junction. Unless we had seen the Chimoré enter, we should probably not have known that the quantity of water was nearly double, the width of the river and soundings being the same.

Lightning flashes to the south during the night; and, as the clouds thicken, thunder roars among the distant mountains.

May 30, 1852.—We have a strong wind from the east this morning, with light rain and thunder to the south. The drops are small compared with those which beat against the Andes in the boisterous region.

Files of white cranes of equal size stand in good order on the mud-beach, with a tall one at each end of the file, of from fifteen to twenty individuals, like sergeants. As we approach, a sergeant steps proudly out, gives orders by a "quack," and the party either faces back over the mud-beach into a hollow, or flies down the river. The manners

and habits of these birds are very amusing. A large crane walks through the drizzle, holding his head and body as straight as possible, which gives him the air of an elderly gentleman leisurely walking out for his health, with hands crossed under his coat-tail.

We entered the river Mamoré, which, at Cochabamba, is called "Grande;" and where the Chaparé empties into it, is named Rio "Sara." It seems the inhabitants upon the banks of this great stream call it by a name to suit their own neighborhood. Those who lived on its more slender parts called it "Grande," probably without knowing where it flowed, or if it was a tributary to the Paraguay or Madeira; while those inhabiting the lower waters changed the name again and again. "Grande" is the Spanish, and "Mamoré" the Indian name.

We find it interesting to see how the people on the Andes supposed the rivers of South America flowed towards the Atlantic. The Beni, for instance, is represented as the source of the Amazon, while it is only the second tributary of the Madeira. The headwaters of the southern tributaries of the Amazon, over which we passed, are laid down in ordinary maps too far to the westward. They are made to appear to the student too near to the Pacific; there is a mountainous strip of land between the headwaters of the Amazon and the Pacific shore.

The long travel of Lieutenant Smyth, of the royal navy, before he reached the navigable waters of the Marañon from Lima, and the still longer journey taken by Lieutenant Maw, royal navy, over the mountains from Truxillo, in Peru, to the same point, show that these officers did not find the head of navigation as soon as was generally supposed they would, by the appearance of the maps they had studied in 1829.

Not only the Beni, but the Mamoré, is made, by recent publications, to flow into the Amazon, not through the Madeira, but by an imaginary course, through a ridge of mountains, distinctly laid down. This map represents the Paraguay and Madeira both flowing from the same source in Brazil, while the source of the Madeira is on the Andes, in Bolivia. Some credit is due to Mr. Woodbridge for endeavors, twenty-four years ago, to lay before the schools a map, which is useful and truthful, with only such errors as are consequent upon an existing want of information.

The Mamoré, at the junction with the Chaparé, being the smaller of the two streams, surprised us; but the rainy region explained the difference. All the tributaries of the Chaparé are within the rain-belt, while most of those forming the Mamoré, above Santa Cruz de la Sierra, are beyond the rain-belt.

Canoes ascend the Mamoré to the mouth of the Piray river, and up

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that stream to Puerte de Jeres, or "Quatro Ojos," as it is more frequently called. Thence travellers mount on horseback, by a road through the forest, to the city of Santa Cruz, where the Mojos cacao is sent to Market. During the latter part of the dry season, in the month of November, travellers from Trinidad to Santa Cruz go on horseback entirely through the country, in preference to *poling* and paddling against a rapid current, which in the descent often endangers the safety of the cargo by upsetting the canoes against snags.

The banks of the Mamoré are the same as the Chaparé. Our soundings are now thirty feet, and the Mamoré has a width of four hundred yards below the junction; this stream flows in a northerly direction. The current of the Mamoré runs at the same speed as the Chaparé—one mile and a half per hour.

While the porpoise bows his back in the air above the surface of the river, and spouts like the porpoise of the sea, small parties of seal whirl round and bark at us daringly. The seals are very small; not near so large as those we have seen on the river La Plata.

At 9 a. m., thermometer, 73°; wet bulb, 70°; river water, 75°. As we passed near the perpendicular bank a moderate-sized tree came down with a terrible crash just before us. The bank broke and the current washed away the earth, and we left the tree struggling with the river, which in time will either give way and follow us down, or stand stubborn as the foundation of another island.

We met with a fishing party of Indians in a canoe, with two women as cooks for twelve men. As we had been feasting on wild turkeys, ducks, and geese, we offered to purchase fish, but they were as much in want as we, and showed a disposition to keep at a distance—very likely on account of our cases of small-pox.

The river was so clear of snags and drift-wood that the men wanted to continue on all night, which promised to be clear, though the day was wet and unpleasant, with an easterly storm, which seemed rather to encourage the musquito tribe. We therefore had dinner cooked early.

After the sun went down the bright moon lit up our water-path through the wilds. The earth seemed asleep as we watched the nodding Indians at their paddles, which hung dripping over the sides of the canoe. At one moment a rustling noise was heard among the canes. We swept close in towards the bank by the current. The burning piece of wood which the old captain kept on his part of the boat disturbed the black tiger, or a serpent slipped softly from a cluster of canes into the water to avoid us. As we turn, the moon shines directly up the river, and the sheet of water appears like a silvery way. We think

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By Lieut! L. Gibbon U.S.N.

Lith of P.S.Duval & Co. Phil.ª

DESCENDING THE RIVER MAMORÉ. Bolivia.

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of obstructions, and fear we are not going fast enough to see the glad waters of the Atlantic.

In the dead of night the owl calls, as though surprised at our daring, and a fish, by mistake, jumped into the boat. As it flapped its tail in the water, on the bottom of the canoe, every Indian was roused from his sleep. After joking awhile, they dipped their paddles into the stream, and away we went again.

Midnight passed; the watch was called, and while Richards fought musquitoes, the first watch slept. The sounding line was kept going by night and by day; the turns of the river mapped by the points of the compass; the distance made marked down at the end of each day, and all the streams entering the one we navigate carefully drawn in.

May 31.—At sunrise we ran alongside of a perpendicular bank of red and blue clay, eighteen feet high; by steps we ascend to see a great pampa stretching out before us, or an ocean of grasses, herd-grass from five to seven feet high, gently waving to and fro by the morning breeze, which came from the east. As we stood upon the bank the sun got up behind us; we looked towards the west over the bottom of the Madeira Plate, which is shallow and extensive.

A shed stands upon the bank, and as there was nothing under it, we took a well-beaten path leading from the river, and walked over a level, among ant houses built five feet high and three feet in diameter at the base, made of clay and shaped like sugar loaves.

The ants ascend to the tops of their houses when the pampa becomes overflowed, and there await the falling of the waters. This pampa, however, is not flooded every year, and we have pretty certain information from the ants that the rise is never as much as five feet. Every house is exactly the same height, though they may differ a little in thickness.

We came to a large wooden two-story building, the "Masi" guard and custom-house, at which all traders and travellers must show their passports and papers. We walked up the wooden steps to the second floor, to call upon the commander of the station. In the lower story was a sugar mill, and we found the commander of the guard in bed groaning with stomach-ache under his musquito net. He seemed glad to see us, and while he sat up in his night-cap reading our papers, we walked out on the balcony to look round.

To the north was a row of small trees which gave the pampas the appearance of cleared lands, but the commander came out and explained to us that those trees grew immediately on the bank of the Securé river, and that they marked out for me the true course of that stream as far

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as I could see, showing that the rivers in this low country are beautifully curtained in with thick foliage, while behind the curtain is a great flat, an extended stage on which wild animals roam. The tall crane stands admiring his reflected whiteness in a pool of clear water, which lies like a mirror on the bottom of this magnificent green floor.

The lands are beautifully hedged in by the line of forest trees. Man has set before him here the hedging and ditching of nature. This pampa looks like a great pasture-field, enclosed by the Mamoré ditch on the south, and the Securé on the north. Under the shade of those trees stand the cattle of the field. They have gradually clambered over the Cordilleras from the flats of Guayaquil, through the table lands of Oruro, and from the salt district of Charcas. The creoles drove them down by the side of the Mamoré river, and let them out into the grassy prairie lands of Chiquitos and Mojos. From this balcony we see one Indian holding a calf, while another milks the cow.

When the cattle came among the Indians, they knew not what to make of them. There were no such animals in their wild lands. The fierce tiger, which they worshipped along with the poisonous serpent, were outdone. The cow interfered with the belief they previously had that the largest animals were God's favorites, particularly those which had the greatest means for active aggression or self-defence.

The cow helped to change such a religion. She was larger than either; and to be attacked by a bull on the open prairie was quite as dangerous as the tiger or the serpent. Great horns stood out boldly in defence of a powerful body.

By degrees they learned that she neither bit, clawed, or stung; that she carried a bag full of milk; that her teeth were given her to cut the pampa grass, and not to devour the flesh of a human being. That she was docile and friendly to man, and not his enemy. The Jesuits taught the Indians how to milk a cow, and how to use its milk. They soon learn how to tend cattle; to lasso them; yoke them by the horns, and fasten long poles to them, so that they might drag along a bundle of drift wood from the edge of the river to the middle of the plain, and to give up their first impression that the tail was the most appropriate and convenient part of the animal to attach the sticks of fire wood to.

In this way they kept gentle cattle by them, while herds roamed through the pampas, became wild, and are now so scattered through the lands that it is difficult to count them.

The horse travelled the same way from Spain with the horned cattle. The ancestors of the five mares with their colts, which we see grazing before us, crossed the Isthmus of Panama more than three hundred years

ago. This beautiful and useful creature caught the eye of the Indian, but as he had never seen an animal fit to straddle and ride, he little knew the true value of the horse who fattened on the pampa grass. When he mounted and found himself flying at full speed across the plain, he must have been quite as much pleased with the invention as more civilized people are with the movements of modern machinery.

The introduction of these animals among the Indians by the Spaniards had a powerful influence over them. It is said that when first the South American Indians looked at a man on horseback, they supposed both *one* animal, and it was not until they saw the man dismount that they knew his distinctness from the horse.

Accounts have been written of an Amazonian race of women defending their country with bows and arrows in their hands. The dress of the Indian men of this warm climate is the same as that worn by the women. The Indians use bows and arrows altogether. It seems reasonable to suppose such was the origin of these stories.

A few Mojos Indian families occupied the only habitations on this pampa. Around the bed-room door of the commander were very light-colored Indian children. One of the several dogs running about, being impudent to Mamoré, received a thorough shaking.

We obtained a large bunch of plantains and bananas, with some yucas and jerked beef, and a cow was milked for us. As we were from Cochabamba, the native place of the bald-headed commander, he was exceedingly kind to us, hoped we would come back and remain with him, as he found it very lonely on the pampa. He says it is very seldom that the lands are completely covered with water, though he lives up-stairs for fear he might be caught asleep. Like the ants, he keeps in the upper part of the house until the water falls, and this is the most elevated land in the neighborhood.

On the wave of the land along the river bank the Indians are encouraged to cultivate sugar-canes. The government has put up a mill under the custom-house for the accommodation of such as choose to pay contribution in sugar. The route of the sugar-cane was originally from China, by the way of the Cape of Good Hope, into Brazil at Rio Janeiro, thence across the interior to the head-waters of the Paraguay river, where the Mojos Indians got it, and carried it up stream to this pampa, and even bore it to Yuracares.

The best sugar-cane in Peru, it is said, came from the South Pacific Islands. So did that of Yungas, which adjoins Mojos at the base of the Andes in the Madeira Plate. The inhabitants there have received this

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plant from different sides of their continent, and the sugar-cane emigrants have met nearly in the centre of it.

The sugar-canes which have travelled from the West India islands, over the Isthmus of Panama into Peru, are thought not to be of as good a quality as those from the South Pacific islands. We suppose this is owing to the difference of soil and climate. The best sugar-canes on the plantations in South Peru come from the Society islands on a parallel of latitude due east through longitude. The plant kept in nearly the same latitude on the same side of the Equator. The line of longitude which passes through the Cuba plantation, runs due south into the Peruvian field, with a great change of latitude. The Cuba plants, in 20° north, were carried through 35° of north latitude, from near the Tropic of Cancer towards Capricorn. Yet, from personal observation while cruising among the Pacific islands, the richest sugar-cane and the most beautiful white sugar was produced among the Sandwich islands. The midshipmen of our mess declared they never saw such molasses as the caterer purchased at Maui—it was like honey.

As the Island of Maui is in the same latitude as the Island of Cuba—both near the Tropic of Cancer—we judge that the canes of Cuba are not less sweet than the canes of the Society islands, until after they are transplanted into South Peru.

The Mojos Indian never would have known there was such a plant in the world, if the sugar-cane had not been carried to him. He does not travel abroad himself, but remains in his own district, as the wild animals do, living upon whatever may from time to time be passed over into his plate. The hand that brought him sugar was the hand of the Ruler of the winds—those winds, the southeast trades.

The old Indian seems perfectly comfortable now that he has milk and sugar. If he was wise enough to know anything about the advantages of commerce, it is doubtful how far he would exert himself. He is rather an indolent fellow. The Indians *want* nothing particularly; clothing they get from the bark of the tree, or the produce of the cotton plant. Yuca is their bread; there are fish in the stream, and beeves on the pampa; coffee, chocolate, and sugar.

The kind old commander said they only produced a little sugar for house use; "there was only one other Creole with him; he had no guard, and the Indian population was but a handful."

There was a time when this pampa was unfitted for man's habitation; when the water lay deep over the land. We are led to believe that the bottom of the Madeira Plate was a great lake. It appears to us like the

bed of an uplifted sheet of water. Water flows into it all round the edge, except at the head of the Madeira, its outlet to the sea.

All the streams that flow from the mountains are confined between high banks; the water is deep; cultivation and navigation join hands. Here we found the first signs of trade and of a friendly exchange.

We floated down the stream, passing the mouth of the Securé, which was two hundred yards wide, flowing in from the westward, and landed to enjoy breakfast. The disappointed governor distinguished himself this morning by making excellent coffee, with milk which we brought along in an earthen pot, manufactured by the Indians from clay of the pampa.

On the sides of the river there are several bays, which the schoolmaster calls "Madres." Some of them are quite large. As the water falls in the dry season these madres supply the river, and in the wet season fill up again. From the name they are considered mothers to the river, from which it obtains sustenance when it gets dry.

We encamped for the night on a sandy beach, from which I judge the Securé river is not navigable far up, and that the distance between its mouth and the rocky formation is not very far. The lands to the west of the mouth of the Securé are wild and little known. Cattle roam upon the plains, and the cinchona trees grow in the woods.

We found a party of fourteen men and boys encamped on the beach. They had been up the river fishing and hunting. A fire was built by them; their canoe lay by the shore, and their white cotton hamacs were slung to poles stuck in the beach in a circle. They all go to bed by word of command, otherwise the hamacs would all come down by the run. They hang their hamacs out where the night breeze, as it comes sweeping up the river, will drive the musquitoes away. Near the trees they are very troublesome, and in the bushes insufferable.

The intelligent bright faces of the boys pleased us. They looked like little girls in their long cotton frocks of white, standing round the campfire watching yucas roasting. The youngsters noticed us much more than the men of the party, who were generally from twenty-four to thirty years of age. These were Mojos Indians, from the town of Trinidad. Our Canichanas crew spoke a different language, though they only live a short distance apart on the pampa. The Canichanas came from the town of San Pedro, and yet these people do not understand the language of each other.

When our men landed, I noticed they said nothing to the others. Our fire was built and camping-ground was near theirs, but the Mojos boys and North Americans were the only ones disposed to be sociable. Mamoré seemed the favorite of both parties; they both fed him, and as

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he ran back and forth, receiving kindness from all sides, the dog became the cause of jealousy between the two crews.

The boys had little bows and arrows and small paddles, but they carried no game or fish—nothing but yuca to eat and water to drink. They were fat, straight, well-built figures, with a clear molasses-and-water-colored skin. When they smiled, their white teeth and handsome black eyes gave them an agreeable and healthful appearance. They were washed of dirt and paint. The savage custom of boring great holes in their ears and noses had been cast aside, and they appeared neatly in simple frock, with straw hat, bows and arrows. The dress is certainly an awkward one for a man, but it is a great protection from the musquitoes, while it keeps off the sun and night dews; they are cool and comfortable also.

The ancient bark dress seems to have been the custom all through the interior of this plate. The Indians of the lowlands dress in bark and cotton cloth, while those of the mountains use wool and the skins of animals. Leather is best in a dry climate and rawhide in a wet one. Straw hats are seen in the truly tropical regions, while cloth caps and fur hats are wanted in the mountains and cold countries. Where there are the greatest diversities of climate, there are required the largest assortment of goods.

Soon after leaving Masi, the banks of the river are seven feet high, with the appearance of an overflow of as much as five feet.

One of the Mojos Indians informed the ex-governor we could get up to the town of Trinidad by a small stream which flowed by the town. This interested our men, as they would be obliged to carry the baggage some distance over the plain on their backs.

They pulled with a will, and entering a small channel we crossed, with the current, from the Mamoré to the river Ybaré. The channel was four fathoms deep and just wide enough to pass.

The Ybaré is sixty yards wide, and has very little current, with twenty-four feet depth of water, though it is said this stream becomes very shallow in the dry season. Descending the Ybaré a short distance, we entered a stream only twelve feet wide, where the men found great difficulty in forcing the canoe against the current. The land on the left hand side of the Ybaré is an island formed by the channel we came through from the Mamoré.

After the men had been working for some time up stream, they rested, got breakfast, and cut several long poles, which were carefully stowed away in the canoe for the purpose of carrying baggage. A trunk is slung to the middle of the pole, and each end is placed on a man's shoulder.

At 9 a. m., June 1, 1852, thermometer 77°, wet bulb 72°; a short time after breakfast, we suddenly came where there were no trees. The men took their bow and stern lines and mounted the bank, and we followed; on gaining the top, there, stretched out to the far east, was a perfect sea of herd grass. As far as the eye could reach the land was as level as a floor; scarcely a tree to be seen except along the little stream we had been following, with a belief we were amidst a great wilderness of woods; but the clear light of day shone down upon an open pasture-field.

While the Indians towed the canoe by the path, "Padre" turned to inquire whether we wanted to go farther down the country; if so, the captain and crew still desired to serve us. But, señor, said he, "should you engage us to take you, please pay us and not the authorities, who keep the silver themselves and make us take cotton cloth." Here, for the first time, I discovered the crew were dissatisfied with the way the governor of Yuracares had treated them. Under the circumstances, I considered it a duty to pay them extra, in silver coin, for valuable and faithfully-performed services.

There are two characteristics in the Indian we particularly notice—his honesty and his truthfulness. We have never lost the least thing from our baggage or persons by dishonest Indians; whenever they offer information it must be asked for, and what they say may be relied upon as correct. We have never found this to be otherwise among any of them—of the high or low countrymen—these traits are observed among all the tribes.

The schoolmaster told me he never knew a boat's crew volunteer to take passengers; that they preferred to go alone, and no doubt they offered to take us because we did not interfere with them. He said it was customary for the prefect of the Beni to "whip the Indians" when they delayed on the voyage up the river. This reminded me that on the way down the disappointed governor told me, if the men did not work fast enough, by threatening to have them whipped at Trinidad they would pull more rapidly.

We arrived at a wooden bridge thrown over the narrow stream, where a number of canoes and Indians were collected. The bridge is on a road leading from a plantation to the town of Trinidad. It was arched ten or twelve feet above the prairies, to prevent its being washed away. In the rainy season the lands overflow every year two feet deep. The road travelled by horses and on foot may then be navigated in

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canoes nearly up to the town. It is now a dusty road; then it is a narrow channel through the herd-grass, which grows eight feet high. The floods come loaded with earth from the mountains, and overflow these lands. The mud settles on the surface of the soil as it filters through the herd-grass. The clean water gradually drains off, leaving a coat of earth behind. The old crop of coarse grass has fallen; the seeds are planted in the old deposite, and up it grows again. Here we have an annual deposite of earth and one of grass-stalks.

The bridge stands so high we can see afar off in all directions. There are a few clusters of trees here and there where the river upheaves the land.

Thousands of birds that fly in the air or walk on the plain are *water*-fowl. Away on the eastern horizon we see a long black line. As it approaches we hide in the grass, for the motion of the wings are those of the wild duck. As the gun goes off, wild geese rise up with cranes, as they do from the edge of a great lake. Snipe and signs of snakes are visible.

Mamoré enjoys being let out of the canoe. He dashes through the grass after the cattle; while he chases the calf, the cow rushes after. Suddenly he comes to a stand in front of an angry-looking bull. Some of these cattle are in good order, while others look small and thin. The land is all new formation; not a stone is to be seen in the soil nor a grain of sand. We now understand why the Indians gather up flint from rocks about Vinchuta. Here is a great market for salt and flints.

We find the sun warm as we walk along the stream. In the distance we see the red-tiled roofs of the town of Trinidad.

Flocks of large blue pigeons are flying by us, and feeding upon the seed of a weed that grows in marshy places. These pigeons are wild, yet they are the same in appearance as the common tamed pigeon. There are a number of large birds we never saw before. One of them I supposed to be an ostrich; but it flew up in the air, spreading a larger wing than the condor, and of a spotted gray color. Among the grass-tops are some of the most beautiful little scarlet and blue birds, all feeding upon the seed.

A deer bounded through the grass; the country seems to be alive with animals.

If we had come down the Andes in the wet season, we have some doubts if we should have found much of the province of Mojos above water; for, from the accounts of the men, they cross the country in every direction in their canoes, while the horses, cows, and other anti-

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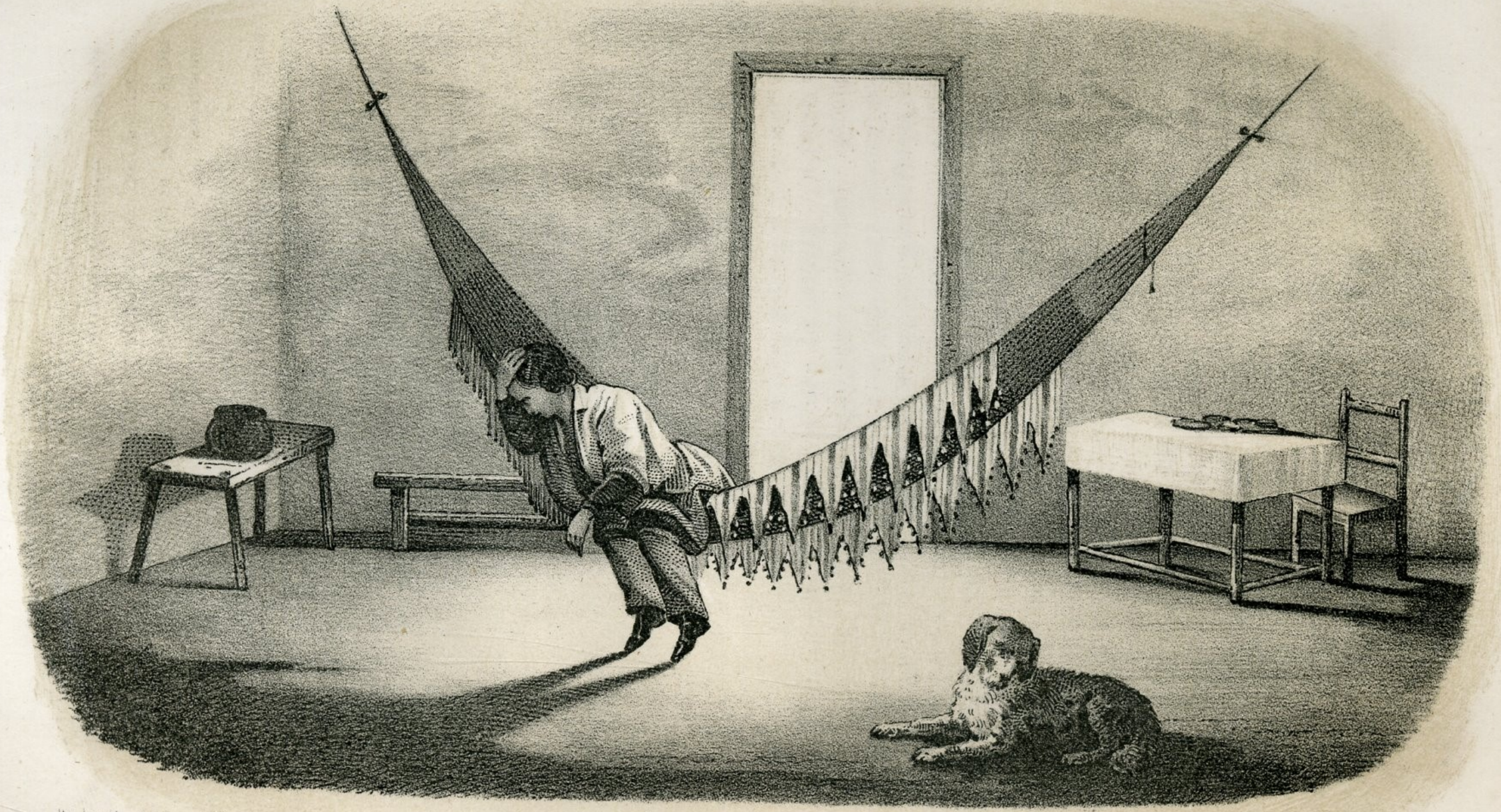

HOUSED IN MOJOS

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amphibious creatures, take to the high spots for safety. They remain on what, in the wet season, become islands, there patiently to wait the going down of the annual deluge. Many cattle and horses are lost by not knowing where to go.

As we approached the town of Trinidad, the canoes lying at the bank of the stream, logs towed up from the wooded country, with the resemblance of the cathedral to a ship-house, added to the number of white cotton hamacs hung under sheds by the canoemen, reminded us very much of a navy yard.

The Indians were all dressed alike, in white cotton frocks; some carrying jars of water on their heads from the stream to the houses; others washing. Carpenters hewing logs for houses, or digging out canoes with North American tools. One of the men was somewhat astonished at the interest we took in his chisel, manufactured in New England, and from hand to hand passed to this Indian carpenter, who used it tolerably well, and took great care of it. He had no idea from whence it came, except that the canoemen from Vinchuta brought it with them. His mallet was of home manufacture. His adze came with the chisel. He had no nails for fastening his timbers; wooden pegs were used. Some of the canoemen were loading with chocolate and sugar for Santa Cruz and Vinchuta; others were unloading salt, flour, and foreign goods. Women were digging clay out of the bank for pottery. The men are industrious, and the women quite as good looking and as pleasant in expression of face as they are active and handsome in figure. The exterior of the town and people was remarkable for neatness. There was life and activity here. What particularly pleased us was, that no shabby-looking policemen came to demand our passports. We walked into town undisturbed by the side of a fine-looking Indian driving a yoke of oxen.

The streets were cleanly swept, wide, and perfectly level; they ran at right angles; each square had been nicely measured by the Jesuits who came into the wilderness, called the savages together, and instructed them how to build a city.

The houses are all of one story, roofed with tiles, which extend over the sidewalks and supported on a line of posts, by which arrangement every house in town has a piazza, and, in the wet season of the year, people walk all round one block under cover, or all over town, only exposed to the rain at the crossings. The floors are on the ground, raised a very little above the level of the street. The hollow of the square is open to all on each side, so that oxen or horses may be driven through. One of these squares is the market place, with buildings all round. One

square in the centre of the town is perfectly open—it is the plaza. A large wooden cross stands in the centre, directly in front of the cathedral. At each corner of the plaza there stands also small wooden crosses, roughly hewn. Next the cathedral stands the government house, the only one of two stories in the place. Here we met the prefect of the department of the Beni. As we knew him before he was appointed, in Cochabamba, he received us as old acquaintances.

One of the government houses was put in order for us, that is to say, a small table, three chairs, and bedsteads, with hide bottoms, were put in, with a jar of water, and the floor well swept. Our baggage was brought up by those of the crew not sent to the hospital, some distance from town, where numbers went every day with the small pox. Our hamacs slung up, Mamoré lay down at the door, and we were housed in Mojos. The crew came to take leave after every thing had been brought from the boat; they were going home to San Pedro, to their wives and families, after being absent on a voyage of over a month. We have been seven days descending from Vinchuta; they were twenty days on the river from this place up.

The old captain made a short speech of thanks for the crew, who seemed perfectly satisfied with what they received in addition to the cotton cloth. "Nig" was more pleased than any when presented with the hide rope he used to lasso the alligator. "Padre" was sent to the hospital; the remainder left immediately.

The doctor of the town is down with the small pox a few doors from us, and one hundred cases at the hospital. We have come into the midst of it, and are obliged to remain to make arrangements to get out of the Madeira Plate, which is considered difficult. There are three ways to reach the Atlantic ocean; one by the Paraguay river; the other across the empire of Brazil, from the town of Matto Grosso to Rio Janeiro, and the third by the Madeira to the Amazon. These roads all pass through tribes of savage Indians. We must try all three before we turn back towards the Pacific.

We dined with the prefect and all the officers of the prefectura, besides some of the correjidores of the neighboring towns in the province. The correjidor or governor of Trinidad, under the immediate eye of the prefect, is an Indian; but those of the smaller towns are creoles, appointed by the prefect, and approved by the government.

The beef was tough and insipid; yucas watery. The correjidores particularly fancied boiled cabbage, baked plantains and yucas served as bread, except on particular occasions, when corn-cake, made of grain mashed into paste between two stones, was presented. The corn is

raised on the pampa near the river banks, and the stones sold in market, after being transported from Yuracares.

A row of large glasses containing chicha was set in the middle of the table, to which the government officials paid particular attention. One of the young men at the table had the goitre very badly, though the swelling was so low down on his neck that he could tie his cravat over it, which gave him a most strange expression. We attribute the insipid taste of the beef of dinner, and the swelling in this man's neck, to the same cause—the want of salt.

The coffee was excellent, but the tobacco not so good as some we found in Cochabamba from Santa Cruz, where the plant grows under a a drier climate.

Don Antonio de Barras Cordoza, a native of Pará in Brazil, came to see us. Don Antonio seems a clever person. He had more resolution in the expression of his face than any man we had met with, while he looked as if he had seen some hard service as a sailor on the Amazon. The quick and pleasant flash of his eye, when I told him I wanted to descend the Madeira and Amazon to Pará, gave me hopes. He told me he had been seven months on his voyage here from Borba on the Madeira river; that he had dragged his boats over the land on rollers by several of the falls on the Madeira, unloading his cargo at the foot of each fall, and, after carrying it by the fall, launched his boat and embarked again. His father had made a trip of the same kind some years before. He advised me not to take a Mojos canoe or crew; that the boat would be broken among the rocks, and that the Indians of Bolivia were so inexperienced they would be of no use to me, even if they did not desert me as soon as they came within the sound of the roaring of the waters of the first fall, as they had already done with some Bolivians who attempted to descend the river with them. It was very clear that our only way was to give up all idea of aid from the canoemen of Bolivia in this respect, and look to Brazil. The prefect might order men to descend the Madeira, and we might go at once; but Indians are unwilling to go a great distance from home. One month to them is considered a long voyage, therefore they would want to return in that time; but, by Don Antonio's account, it will take them at least seven months to return alone. The Indians keep count of the number of days absent from their wives by cutting a small notch in the handle of their paddles every seventh day, and a crew that returns with over four notches has been absent a long time from Trinidad, it is thought.

Don Antonio explained to me how it was that the canoes of Mojos were not fitted for the route down the Madeira. They are all hewn or

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dug out of one stick, long and narrow. When the crew drag the canoe over shallows in the river, she may lodge on a rock under the centre; the heavy weights fore and aft, on a boat forty feet long, break her back in two. The heft, as well as the length of these canoes, make them unmanageable among the rapids. When we come to navigate the land, he said, she might go along as well as other boats, but they were unfit for the waters of the Madeira.

Don Antonio was a trader; he had brought up a cargo of fancy glass-ware; liquors of different kinds—French wines, brandy, gin, and sweet wines. The Indians drink chicha; they are unaccustomed to the taste of good wine, and care little for it; they also use earthenware. For four months he has been here with goods exposed to view in a house on the corner of the square. He has sold but little. The iron he brought sells at eighteen and twenty cents the pound. He has but a few pounds that is not sold. Sweet oil is used among the few creoles, but they refuse to take it by the bottle; so he retails it out, six cents a wineglassful.

He invites the people to purchase fire-rockets by setting off a few now and then at the corner of the plaza. A creole comes along and gives him so many pounds of cacao for so many rockets, which he takes, knowing he will have to send the cacao to Santa Cruz to get money for it.

I lived with Don Antonio, and mention with confidence and respect, that when we had eggs they were purchased with a handful of salt for two; a wineglass four times filled with sweet oil paid for a chicken; two glasses bought a pound of sugar. A jar of molasses was offered us as a present from the correjidor; and a lady sent a pair of ducks, for which a bottle of sweet wine was returned. In this act Don Antonio displayed the most exquisite gallantry and generosity, so considered by her lady friends next door.

Don Antonio owned the only two boats from the Amazon on the upper waters, which were of the proper build for the falls in the Madeira. He offered me one of his small boats when it returned from the Itenez river, but he had no men. I was obliged to wait and go with him to Brazil to get them.

We met an Englishman here who had made a voyage over the falls in the Madeira and back with Señor Palacios. He also advised me not to trust the Mojos Indians on such a journey. This was discouraging, for I was uncertain how long we might be kept without knowing whether we would eventually succeed or not. This was the dry season, and the proper time to move forward. Should we be delayed until December in this plate, our chances were over until next year.

The Department of the Beni has a population of 30,148 friendly

Indians and creoles, of which 6,732 Indian men, between the ages of eighteen and fifty years, and only 325 creoles, pay contribution to the government of two dollars each a year. There are 985 men in this department over fifty years of age, and they are excused from paying this tax, as well as the women and children.

The government of Bolivia settles accounts with the church for the Indians out of the annual income of $13,464. The Indians pay this tax in cotton table cloths, sheets, hamacs, towels, ponchos, and pieces of cotton goods made by their own hands. They cultivate maize and coffee, tobacco, yuca, oranges, plantains, lemons, and papayos; cocoa grows wild along the rivers; rice is raised in small quantities.

A home-made table-cloth is worth three dollars; there were over seven hundred exported last year from this department. A pair of sheets costs five dollars and fifty cents; a hamac, five; a towel, two. Over three thousand yards of Indian domestic cotton cloth were also exported last year, at thirty-one and a quarter cents a yard; dry hides are valued at twelve and a half cents; tiger skins, two dollars; straw hats, from fifty cents to one dollar; coffee, three dollars; tamarinds, two dollars; tobacco, one dollar and twenty-five cents; and cocoa, two dollars the arroba of twenty-five pounds; prepared chocolate is worth eighteen and three-quarter cents a pound.

It is difficult to estimate the annual yield of cacao—last year over eight thousand arrobas were sent to the people on the Andes. Horned cattle on the pampa are worth two dollars a head. A few Brazil nuts are brought into the market of Trinidad, where they sell at one dollar the arroba.

This is a list of the exports from the very bottom of the Madeira Plate—all of which are sent out against the current and up the sides of the Andes. There are a few Indians in Yuracares who pay contribution in cinchona bark; it has to be entered at the sub-treasury here; forty arrobas have come down in a year. The Indian is allowed eight dollars and seventy five cents the arroba when it is forwarded to the Pacific ocean.

While the door of this interior is at the head of the Madeira river, the people go back up-stairs, and pass their goods and chattels over the roof, down through the chimney, to the Pacific; stemming the current, and struggling against difficulties among the clouds, through storms and dangers, passing through cold, frozen regions, on the way to market; leaving a most productive country road, and passing through one less and less valuable, until they get into a desert, the off-side of which may be approached by a ship; while Don Antonio has brought his vessels

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from the Atlantic ocean, and is trying to sell them the very articles they are struggling for at such great expense from the other direction. He has brought a cargo of glassware and Pennsylvania iron up the Madeira, while they seem to insist upon getting New England tools over the Andes. He expresses to me the great difficulty he finds in selling his cargo. The creoles seem perfectly contented with the trade as it is; some of them have gone so far as to express an opinion that, should commerce be made to flow through the Madeira, it will *destroy* their present *prosperity*.

The department of the Beni is considered by the government the dungeon of this country. When a man's opinions are thought by the president to endanger the public peace, he is banished to the Beni. He leaves his domicil on the tops of the Andes, and comes down under the tamarind trees of Mojos. This band of exiles settle here amidst an industrious tribe of Indian planters. By their superior intelligence and greater recklessness, as a race, they out-trade the Indians. The Indian produces all the necessaries of life—he makes hats, cotton cloths, and leather shoes; tends the cattle; manufactures sugar; raises coffee and chocolate, yuca and plantains; builds houses; bakes the pottery, and lassoes the horse on the prairie for the creole to ride. He is brought under control, and obeys as a servant.

We find our enterprise less popular here than anywhere upon our route. The prefect of the department tells me he doubts if one of the people will consent to go down with me to the Amazon; that Señor Palacios was one of the government authorities, and the Indians did not dare to disobey when they were called upon to go on his expedition; but the Englishman says the men had such a rough time of it on that occasion, that when they returned and told their families and neighbors, it made such an impression they refused to go again, and deserted from the canoes. One of the correjidores fitted out an expedition for Pará; when the Indians ran, he confessed he had to run with them for fear of being left to starve in the wilderness. They have less fear of savages, it is said, than of the roaring sound of the falling waters.

I rode two leagues over the pampa with Don Antonio, to visit his vessels, which we found moored by the bank of the Ybaré river. The largest, the size of a line-of-battle ship's launch built upon, had a covered cabin, and a roof over the forward part of the hold, called by the Amazon sailor "Coberta." The second one was also covered, but smaller, called "Igarite." They are without masts, propelled on the river by paddles or poles, and prepared to pass over the land on rollers. The largest one mounted a small four-pound iron gun, which Don Antonio

fired off when the new prefect arrived; and the sound of that little gun was echoed through the whole of this country by the newspapers.

On the Andes we found two languages spoken by the Indians of the great tribes, the Quichua and Aymara, both in the days of the Incas under the same government. But in the Madeira Plate, the Indians living on the same plain are divided into small tribes, and speaking different languages, between the Inca territory and uncivilized tribes of savages below them. Here, in the city of Trinidad, the tribe is called *Mojos*, speaking the same language as the Indians of the three nearest towns—Loreto, San Javier, and San Ignacio. In Santa Ana the language differs; the Indians speak *Mobimos;* in San Pedro, *Canichanos;* in Exaltacion, *Cayuvaba;* in San Ramon, Magdelina, and San José del Guacaraje, *Itonama;* in San Borja, *Borgano;* in Reyes, *Reyesano;* in San Ivaquin, *Baures* and *Yuracares.*

Here are nine different languages or dialects in the same district of level country, and we recognise a difference in the physiognomies of the Yuracares, Mojos, and Canichanas tribes. The Yuracares are more lively, cheerful, and talkative; they are lighter colored, more fond of hunting and rambling through the woods than the others. The Mojos Indians are a grave, sedate, and thoughtful people. They are larger than the men of Yuracares. The women are considered handsome; those of Yuracares are very homely. Here the girls are large, well developed, and pleasant; there they are small and cross-tempered, looking as though they wanted to quarrel with men. Here they take their rights without asking. The Mojos Indians are particularly fond of cultivating the soil; they drive the ox-team well. The boys run away from school to the plough-field, where they seem to enjoy the labor, or paddle the canoe with a load of fruit to market. They have little fancy for the town or house; the older ones like farming the best, and the women seem satisfied to stay at home. These Indians carry no bows and arrows about with them, except on long voyages up and down the river. Since domestic cattle were introduced, they have put aside the arrow and taken up the lasso, which they handle well. They know nothing of fire-arms, never having used them. The Spanish race has stripped them of all means of defence, except the war-club, should they choose to cut one. They are civil, quiet, and peaceable; seldom quarrel among themselves, and are already taught the consequences should they do so with the creole, who treats them worse than slaves. The humble Indian obeys the meanest creole. The laws are made for the creole, not for him; he pays the same annual tax, yet he has no vote. He is ignorant of the laws by which he is governed. But one case has been known

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where the correjidor had been so overbearing and cruel in his treatment of them that they put him to death and burnt the government house. These sent to say they would obey any one else the President might appoint over them. They built a new government house, and were ever after quiet. These were the Canichanas, the same as our faithful canoe-men, who appear to be spirited fellows.

The province of Mojos extends to the east as far as the Itenez river, which is the boundary line between it and Brazil. The country is inhabited by wild tribes of savages, upon whom the Jesuits never could make any impression, for they will neither hold friendly intercourse with the Spanish race nor with the friendly Indians. They are warlike in disposition, and meet all overtures on the part of others at the point of their arrows.

The labors of the Jesuits, here, were much more difficult than on the mountains, where the whole nation seemed as one man to fall under the new order of things after the Spanish conquest. Here all the different tribes had to be approached with distinct care, for as their language and dispositions differed, their forms of worship also in some degree varied from each other. The Jesuits were untiring in their efforts, and made advances to them all. Many of the priests were murdered in their moral struggle with the red man.

The few Spaniards who followed down the eastern slope of the Andes at the heels of the priests, and settled near the line, have not assisted the workings of the church; for, wherever they have met the savage, a difficulty between them have caused continuous wars, and now the savage disposition of the red man excites a constant desire for revenge.

The Spanish schools are drawing the children of these different tribes closer together by teaching them lessons from the same language. The Bolivian government has adopted a wise plan to bind these ignorant people together. The fewer number of languages the more friendly disposed people become towards each other.

We have seen on the mountains the effect of the Quichua speech taught by the Inca family to the wild tribes that inhabited those regions. There remained but two languages from the equator to the southern boundary of Potosi, and the highest state of civilization. From what we see of the Mojos Indians they are quite as intelligent, and even more so, than the Quichuas or Aymaras, who never manufactured the wool of the alpaca or vicuña so well as the Mojos Indians do the cotton. The stone-work of the Quichuas or Ayamaras does not surpass the wood-work of these. The stone chisel in the hand of the Cuzco or Tiahuanco Indian was skilfully used; but we see at a glance in how

superior a manner the Mojos Indian employs carpenter's tools. The mountain Indians have been praised for their natural talent in painting. Some of the productions in Trinidad would amuse the critic; yet the highest taste is found here. The lesson in colors is nowhere more plainly set before the eye. We have seen in the hand of a Mojos Indian a bird the size of a sparrow, with seven distinct colors among its feathers; probably there is no part of the world where there are a greater variety of beautifully-colored birds than in the Madeira Plate.

The aptness of these people in learning is not second to those of the mountains. They cultivate the sugar-cane quite as well as the others do the barley, and when we examined the woollen goods of the mountain girls, and compared them with the white cotton dresses of the fair ones on the banks of the rivers in the lowlands, both made by their own hands, we must give preference to the manufactures of Mojos, with all deference to the memory of Manco Capac's wife, who taught the mountain girls to net and knit, to spin and to weave. The Mojos women are few in number, and the people of the next tribe being as exclusive as those of Japan, the manufacturers of the one tribe had no opportunities to exchange with them ideas.

The Mojos Indians have a natural fondness for painting human figures and representing birds and animals, particularly the common chicken and the cow. The latter seems to have made a deep impression upon them at first sight; they often paint the cow fighting or chasing a man. These Indians describe the novel sights. I have not seen a single painting of an Indian or of an animal which originally belonged on this pampa. The white man, the cow, and chicken cock, are their favorite studies. On the white walls of their houses, inside and out, such figures appear as a decoration. In the rooms of the government houses the best artist displayed his talent, and those drawings on the walls of the market-place are admired by all who go there. So much taste and caution have the boys and little children, that none of them are known to disfigure any of these paintings in the public market-place.

The Indians of Cuzco have had some of the most beautiful, large, and costly paintings hung before them in the churches of that ancient city. The church encourages this taste; yet we saw nothing there like what we find among these people who have never had lessons set them, and the natural scenery here is less calculated to draw upon the imagination. The whole country is a dead level; the view only extends to the horizon, the sky above, and one continued sheet of herd-grass below.

The Mojos Indian makes a scene for himself, and describes it with colored paints. On a windy day he strikes light and puts fire to the

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dry prairie-grass. As the wind carries the fire swiftly along, and the sheets of blaze shoot up under the heavy cloud of smoke, the Indian sketches the effect produced upon the cattle, who toss their tails into the air, and rush in fear with heads erect at the top of their speed in an opposite direction to that from which the wind comes. He decorates the inside wall of his house with this scene, which is a common one on these prairie lands.

The Mojos Indians have musical talent also, what the Quichua Indians want. The Aymaras have a little, but the Mojos are decided by natural characteristics: they play the guitar, violin, and flute; blow their organic pipes, and beat the drum. They accompany the instruments with a sweet voice, and read music with ease. They all take part in church music, while on the mountains a regular choir is employed.

The altar of the cathedral is beautifully carved out of ornamental woods, adorned with hundreds of dollars' worth of silver. The candlesticks are made of tin, and the candles are tallow. The silver and tin came from Potosi. The wood and tallow are close at hand.

We are ignorant of the means used by the Jesuits to incline the savages to collect together on a swell of the pampa, and plant the corner post of this cathedral. They could not understand the white man's language; they worshipped what they saw before them on the plain, in the heavens, and among the woods; and yet they were induced to erect a church, kneel in it, and worship the God who made them as well as the animals. All this was accomplished by a series of signs of the hand.

Don Antonio brought among his cargo some gold ornaments manufactured in France and Portugal; amidst other similar articles, a number of gilded beads. The Indian women of the town of Exaltacion fancied and purchased a quantity of them. They were sold as gold beads, just as a jeweller disposes of such things. The Indian women put one of them into the fire, and after heating it well and then cooling it, placed it by the side of some others. The change of color proved to them that the beads contained alloy. They were at once deposited in the hands of the police and sent back to Don Antonio, who had left for this place. He laid the case before the prefect, and informed him the beads had not been sold as pure gold, but as ornaments. The beads were forwarded to a jeweller in Cochabamba to determine their true value, which was as Don Antonio said. But the Indians would not receive them. They answered that the beads were not pure, and for that reason they did not wish them, nor would they wear such things if they were manufactured in Paris. He had to return their money.

Gold manufactured into ornaments in this country is generally worked up just as it comes from the river, without the application of any artificial alloy. The Indians do not understand this art of mixing. The Spaniards often do; and the Indians have their own way of proving the impositions sometimes practised on them. The Brazilian merchant was exceedingly annoyed at the idea of being considered dishonest by those he had been dealing fairly with. He tried in vain to show that he sold the beads for less than if they had been pure. It was of no use; the Indians had their ideas of what they should be; they did not want the reasoning, but pure gold beads.

Don Antonio made a young mestizo girl a present of a gilded chain, because she had purchased a number of ribbons and silk handkerchiefs from him. She brought it back a short time after, and thanked him for it, saying it was of no use. They had put it into the fire, and it very soon turned copperish. He was much displeased with her, because he had made it a present; but she answered, "Had your present been pure, I should have valued it."

Shot-guns are valuable; but the people refuse to pay coin for them; there is very little here indeed. The Amazon trader, who comes from a cacao-producing country, is invited to accept so many pounds of chocolate for a shot-gun, or to exchange shot for the same article.

The copper coin and paper money of Brazil are of no value here. The smallest coins in Bolivia are three-cent silver pieces. There is no copper currency. The metal is found on the plains of Oruro in too great abundance. Neither have they paper money in Bolivia as in Brazil.

The authorities mentioned to Don Antonio he would be expected to pay a duty for every thousand dollars he may collect in silver and gold in the country. The people seem jealous of the foreigner who brings them goods and carries off silver.

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CHAPTER X.

Horned cattle and horses—"Peste"—Salt trade—Church service—Bull-fight—Mariano Cuyaba—Rules and regulations of the town—Laws and customs of the creoles—A walk through the plaza at midnight—Scenes on the road to the town of Loreto—Annual deluge—The beasts, birds, and fishes—Loreto—Inhabitants—Grove of tamarind trees—Winds of the Madeira Plate—A bird-hunter—Trapiche—A black tiger burnt out—Departure in Brazilian boats—Enter the Mamoré river again—An Indian overboard.

Horned cattle and horses are scattered over the plains of Mojos far away from the settled parts, and are now roaming wild through the country, so that it is impossible to estimate their numbers. A creole returned to Trinidad from Reyes reported many thousand cattle roaming wild between the Mamoré and Beni rivers.

These cattle and horses are suffering under the effects of an epidemic, which the creoles call "peste"—plague. This disease is said to have been brought from Brazil, where the cattle are affected in the same way. The horse seems to suffer the most. Within the last few years nearly all the horses in Mojos have been swept away by the "peste."

The first symptoms are weakness in the limbs. The animal does not lose his appetite, but gradually falls away, until his strength is entirely gone, when he lies down and eats the grass around him even to the roots with a most ravenous hunger. The nearer death approaches the greater his desire for food, when he ceases to be able to hold up his head, and finally is lost. We have seen a fine saddle-horse in good order kept clear of the peste by placing a cake of Potosi salt where he might lick it when he chose. This noble animal seemed really to feed upon the salt. His coat was sleek, and he held his head up above the pampa horses, who are never supplied with this expensive article.

The cattle all look miserably thin and stunted, as though not well fed, yet the plains are covered with a fine growth of grass. This epidemic commenced in 1846. There is no telling the sweeping effect it has had upon the cattle. As to the horses, we judge they have nearly all been destroyed. We see them still dying about on the plain. Mules are affected in the same way, though they linger longer than horses. Salt dissolved in water will sometimes bring them to after they are unable to stand on their legs.

As we never heard the Gauchos of the pampas of Buenos Ayres

speak of this disease, there is reason to believe it is principally confined within the rain-belt region, where fresh water covers so much of the pasture lands. We have no account of this disease having destroyed the cattle and horses of Chiquitos, where evaporation is greater than the precipitation.

Throughout our route we have found more females affected with the goitre than males. In the deep mountain ravines, we were nearly led to the belief men never were troubled with this swelling of the throat.

While looking at a drove of cattle, which has just arrived from the plains, at the market of Trinidad, we noticed that while nearly all the cows, young and old, were miserably thin, many of the males were in good condition.

There is no trade at the present day in this part of the country so important as that of salt brought from without the rain belt. This rain belt is broken. At Lima, in Peru, it never rains, only sometimes drops. There the precipitation is very little, and the evaporation great. Lima is in latitude 12° 03′ south. A few leagues north of Lima, on the coast, are found the salt basins of Huacho. Sea-water is let into basins on the plain. In twenty months the sun evaporates the water, and blocks of salt are left, which supply the markets of North Peru. The government of Peru takes advantage of the break in the rain-belt, and leases the "Salinas," as they are called, to those who pay an annual rent into the public treasury.

The salt of Huacho is carried east, over the Cordilleras, to the valley Juaja, where it rains half the year, and where we found animals suffering for the want of it, though found in veins. The northeast and southeast trade winds carry rains from the north and south Atlantic up to the snow-capped Cordilleras to the west of Juaja valley. There the winds give out; after they have had all the moisture wrung out of them, there is none left to pass over the Cordilleras and rain down into Lima. The break, in the rain-belt, formed by the meeting of these two trade winds, drawn back and forth after the sun takes place on the very tops of the Cordilleras range of mountains, where the last drop of moisture in the winds freeze and fall in the shape of snow flakes. Just below this is found the native habitation of the Peruvian camel. The Indian who inhabits the valley of Juaja, in want of salt, drives the llama down to the Pacific coast, and takes it from a line level with the ocean. He goes to the sea for it in preference to collecting it from the mine. Should he go south, to Chile, he finds the southerly winds bring rain along the coast, and instead of a supply, he finds a market. If he goes north of

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Huacho to Equador, there northerly winds bring rain, and there is another market.

The Indian loads his llama with one hundred pounds of salt, and drives him up the western slope of the Peruvian mountains, through a gorge filled with snow, over sixteen thousand feet high, to the plains of Juaja.

While the Potosi Indian loads his argentine mule with three hundred pounds of salt, not from the ocean, but from the salt lakes on the plains of Potosi, made by the natural evaporation of the sun from a fresh water stream on the top of the Andes, running over rock salt; he, too, takes it under the rain-belt to the market of Mojos. If salt may be made so readily from the water of the sea at Turk's Island in the West Indies, why may it not be made somewhere on the west coast of Mexico? The scorching rays of the sun peel the skin off people's noses there just as they do on the table lands of Potosi, and along the shores of Peru.

The town of Trinidad is the largest in Mojos, with a population of over three thousand, few of which are creoles. The national creole guard musters about twenty soldiers and five officers, headed by the prefect with the rank of *General de Brigada*, armed with old flint-lock muskets. One common gun-flint will purchase, in the market, a basket containing one dozen delicious oranges. The flint part of Don Antonio's cargo was disposed of at once, and the silver willingly paid. He brought a supply for a long time to come, even at the risk of a revolution. External wars have never interfered with Mojos, except the war of exclusiveness.

On the 6th of June, mass was held in the cathedral, the day being called Santissima Trinidada. After mass we witnessed a grand procession, headed by the prefect and clergy, followed by the whole population dressed in white gowns, "camecitas," as they are called here. Whenever the Indians are performing church service, the women unplat their hair, and allow it to hang gracefully loose behind over their white dresses. The hair of the men is cut short.

At each corner of the plaza was an arbor, constructed of green foliage and flowers, with plantain trees and palm leaves. As they marched round to music and singing, the scene was beautiful and interesting. The red race dressed in white cotton cloth, following the catholic clergy in rich costume, bearing wooden images on their shoulders; three thousand savages, half civilized, were singing church music, and living under the laws of quasi white men. The few creoles who walked by the side of the prefect and clergy were but a drop in the plate.

After the procession returned to the cathedral, the Indians pulled

down the arbors and entered the plaza, bearing long poles, with which they built an enclosure on the corner of the square next the prefectura. A pen was erected adjoining, in which, one by one, were placed a number of savage bulls, wild from the pampas.

The people gathered round and on the balcony of the prefectura; musicians were comfortably and safely seated. As twelve or fourteen able-bodied Indians entered the enclosure, a bull was let loose on them, and the play was commenced. The bull rushed at the first man near him, and as he got away, ran headlong towards the crowd outside the poles. The people laughing jumped on either side and let the animal run his horns into the fence. He became furious, bellowed and tossed the poles of the fence into the air, but they were quickly put in place by the crowd outside.

Red handkerchiefs were shaken at his head; some pulled his tail, while one man, who was engaged talking to another, found himself suddenly raised off his feet by the horns of the bull under his camecita. He was not hurt, for by this time the bull had been teased so much he was tired down, when he was hissed out of the ring and let loose, to find his way back to the plain.

This was great sport for the Indians; they seemed particularly to enjoy the fun. Great jars of chicha had been provided by the authorities of the town, and passed round among those who wanted to drink. There were few who declined, and as soon as the bull was let out, baskets of bread, made of corn and yuca meal, were emptied from the balcony over the heads of the people, who scrambled after it. The manner in which this bread was presented to the Indians from the government store, was the same as throwing corn to poultry elsewhere. They scrambled for it amidst the dust that had just been torn up by the hoofs of the enraged bull.

After the scramble was over another bull was entered, and the sport continued, while a third was being saddled. An Indian mounted, holding to a strap placed round the breast of the bull; when they let him loose, the heaving and setting of the animal was most laughable; the man's head was heavily nodded and jerked backwards and forwards as the bull reared or kicked up behind. It was like the tossing of a small fore-and-aft schooner in a heavy seaway. The roars of laughter from the Indians were amusing; they highly enjoyed the saint's day of their city after the programme arranged by church and state.

The good order at all times maintained, the greetings of the people, and cleanliness of the city are owing to certain internal regulations.

Fratos, an old Indian, is considered the rich man of Trinidad; he is

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the correjidor and commander of the town; all the other officers among the Indians are under his orders.

Mariano Cayuba, another respected Indian, seventy-three years of age, holds the office of "casique," which is second in command. Cayuba receives all reports—how many sick, and all deaths; the condition of the town, as to cleanliness and good order; how many canoes in port; their arrivals and departures; and the state of the cattle on the plains. When Cayuba goes to prayers in the evening with his wife and children, he stops at Fratos's house and tells him all; makes a regular report of everything that is going on, be it good news or bad. Fratos is held responsible for the good order of things by the prefect, to whom he also pays a daily visit, for the purpose of posting him up in regular order by word of mouth.

Cayuba receives his reports from the following officers: one "intendente," who oversees portions of the public business, with one "alferes;" four "aguacils," (constables;) eighteen "comisarios," who carry orders, keep watch at night, and are employed on duty about the prefectura—one of them is head waiter at the table; two "policia" officers, whose duty it is to see the boys of the town supply water for drinking during the day. The boys are marched out of town early in the morning with earthen jars on their heads—in the wet season to the stream, and in the dry to the lake. Boys don't like such work, but they grow fast, when this labor falls to others. Four "fiscales" superintend the streets and houses; see that they are kept clean and in order. A fiscale, in olden time, was a ministerial officer—an attorney general. Sixteen "capitanos," who command gangs of one hundred Indians each—these are working men. Whenever the government of Bolivia requires a house to be built, a bridge made, or a sugar plantation and sugar-cane gathered and manufactured, an order is given to that effect to Fratos, who calls for one or sixteen captains' companies, as the case may be, and they muster their men into immediate service, for which they receive no pay, as it is for their country they are laboring.

A "teniente de estancia," or mayor-domo de estancias, overlooks the cattle in the prairie; keeps accounts, as near as he can, of their number; what their condition is; whether the floods and the tigers destroy them; what is the state of the pasture-lands. When he finds the grass dead, he fires it, and a young pasture springs up, as the rain begins to fall, and fattens the cattle. He instructs the Indians how to build enclosures for the calves, which keep them from running wild. This brings the cattle in from the plains, when their bags of milk pain them—so the calves and people are both supplied without the trouble of driving in

the cattle. An "alcalde" takes charge of all the canoes in the ports; attends to their repairs; gives orders when others are to be built or dug out; appoints proper crews to them, when, through sickness or otherwise, the men are called away. He reports to Cayuba the state of commerce; how much cacao goes up the country, and how much salt comes down—in fact he is the "old salt" of the tribe.

Under this system of regulations the city is kept in order; no quarrelling or fighting is ever seen in the street. As soon as a person is taken sick, those whose duty it is to attend to that department give aid and assistance to the family; people are sent to the hospital as nurses, and a doctor of medicine is furnished by government. The daily duties are performed by all with so much regularity that no one seems to be over-worked, and all appear to be accommodated, for every Indian man is obliged by the regulations to do something; there are no loungers here except the creoles. One Indian goes a voyage on the river; another is obliged to cultivate a chacra or farm, tend cattle, cut timber, or learn some trade; while the boys go to a school teacher provided for them by the government.

The women are free to do as they please, which suits them best. They are volunteer workers to pick cotton, spin, and weave it by hand. The frame for the weaver is a simple wooden one, which stands upright in a corner of the house, where the women work at it when they have the cotton spun, by twisting it suspended from the hand to a ball, the thread being wound on a slight stick; both spinning and weaving appear to us very slow work, but time is never considered by the Indian; he works as though he lived for the present, and thought more of the past than of the future.

The prefect has a secretary and clerk; a captain of police superintends the whole department of the Beni, and reports any internal disturbances; he keeps watch upon all people to see there are no revolutionary schemes, and receives twenty-five cents from every person wishing to leave, for a written passport granting permission so to do. When a traveller wants a boat and crew, he applies to the captain of police, who sees that the proper price is paid to the men, and no more. He is a creole, like the clerk of the prefect. The only other creole officer in the town is a justice of the peace.

For the last ten years the Indians of the Beni have paid annual contribution. Before that time the government supplied them with clothing, fed and lodged them, and received into the public treasury the whole products of their labors. The Indians very properly became dis-

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satisfied, and it was found advisable to change the order of things, and to tax them.

Cayuba was the wise man of the Mojos tribe. He was respected for his intelligence, while Fratos claimed rank over him on account of his wealth. This Cayuba thought unjust; while he performed his duty well, and his house was the gay one of the town, he was constantly reminded by the most important man about him that he should be made correjidor. He was a planter, and owned a large chacra on the opposite side of the lake. The prefect took me to Cayuba's and gave me a formal introduction to him. His first question was: "What is your name?" On being told, he sneezed, shook his head, and said, "Mucha questa."

When the arrieros reach the foot of the mountains, they point to the tops of the Andes, and describe the difficulties of gaining the summit with the cacao, by saying "mucha questa"—much up-hill. Cayuba used the same expression to explain to me in Spanish how difficult English sounded to his ear. He looked intently at me and said—"Another language? Where is your country?" I pointed to the north. "Ah," said he; "have any women there?" The Indians think strangers travel about alone because they have no women at home to take care of them.

Cayuba often came to see me. He spoke a little Spanish, and was so anxious to know all about my country, we became great friends. I asked him whether the people were happy. He said, "Yes; but we are all slaves to the white man; we used to have plenty of cattle and fine horses. The white man comes from Santa Cruz and drives them all away."

By the laws of the land, Indians are punished by whipping on the bare back with a raw-hide rope—twelve stripes for insubordination, drunkenness, or idleness. The custom among the authorities has been to punish whenever they deem it proper, with as many lashes as they please, though there is less punishment now than in former times. One prefect, who was exceedingly tyrannical in his behavior to these people, was recalled, as the Indians all signed a petition against him to the President. He was displaced and afterwards banished to Brazil. On the voyage down the Mamoré river, the crew filled the boat with water at midnight while the ex-prefect was sleeping. They swam to the bank, and he was drowned.

Cayuba introduced me to his wife—a fine-looking, fat, cheerful Indian. Juana Jua Cayuba was very industrious; she superintended the hired women moulding earthen jars, which are used in manufacturing

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MARIA NOSA. CASEMIRA NACOPEARU. JOSE VICENTE. CAYUBA. JUANA JUA.

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sugar; her house was kept in neat order; she was constantly employed weaving cotton hamacs, table-cloths, sheets, and bed-spreads; she wore two gold chains round her neck, to which were suspended a silver cross and a medal; she wore ear-rings of pure native gold, and on Sundays a very respectable man-like black beaver hat; she was a strict church woman, and kept Cayuba in that direction, who sometimes shyed off or overslept himself in the hamac, which was slung across the room.

The Indian men take to the European fancy of dress. On Sundays, before the authorities call upon the prefect, they take off the "camecita," and put on trousers, coat, vest, boots, and hat; each one carries a cane, the signal of his office. On such occasions they walk with the most amusing air of importance. Cloth clothes are very different from their usual cool dress, though they undergo the greatest amount of warming rather than take them off before sun-set. All the discarded black beaver hats, which have been battered and bent on the road down the mountains, find a market here. All the queer-looking black frock and swallow-tailed dress-coats, that are made in the country, seem to have concentrated and are displayed before the public on state occasions, in this place. The native dress, worn by the Indians, is well adapted to the women, but the men work quite as awkwardly in camecitas as they appear in thick cloth clothes.

Cayuba was kind enough to send us milk and fruits; when I asked him what I should present him in return, he said, "a black silk handkerchief." He was fitted out complete. The interest Indians expressed in sketches of their country, their town, or themselves, was remarkable. Cayuba was much surprised at daguerreotype likenesses of two ladies. He came to my room next day with a party of old men and his wife, to request they might be shown the women "of my tribe." He looked at the pictures, then at his wife, saying he would like to swap her off for the original of that likeness; and then turned to me and said—"Have you got plenty of them there?" pointing to the north, and looking very intent.

Before the break of day the whole population, except the creoles, are upon their feet; as day dawns, drummers, fifers, and fiddlers, assemble at the church, and beat reveille. The church bells are hung under the roof of a small steeple near by; as they ring, the Indians flock to morning prayers. The year round this form is gone through, as it was originally established by the Jesuits. While kneeling in church, the music commingles with their songs of praise, as the morning sun throws his light upon the city.

Every evening the same ceremony, as the sun descends over the An-

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des, at 8 o'clock, on clear nights, the boys of the town kneel by the large wooden cross in the centre of the plaza, and sing a hymn before the inhabitants retire. A band of music accompanies their voices. As the bright moon lights up their world, these little boys shout their verses of thankfulness for the blessings of the day just past, and pray that God will protect his people in their sleep. There was something agreeably impressive in these forms of the church to attract the attention of the Indians. This daily service was pastime for them; their true natures were worked upon, and we found them performing such religious duties in a willing, grave, sincere manner, while the rules permit them after prayers to frolic. We have never seen more sober faces than among these Indians, as they walk to and from church; nor have we ever heard a more hearty roar of laughter at a bull-fight than in the plaza of Trinidad after mass.

Marriage ceremonies are performed by the priests, according to Catholic form. Before the appearance of the Jesuits, such were not known among the Indians, except in their own hearts.

We had been detained some time in Trinidad. I became much troubled at the idea of being fastened up amidst disease during a long rainy season, doubting by which route we were to find an outlet to the Atlantic. Kept awake after midnight; to drive away thoughts of the morrow, I got up and walked out into the plaza. The night was clear and moonlight; the only noise at first heard was that made by the bats—the air was filled with different species of these night-birds, flying in all directions, feeding upon musquitoes; the tops of the houses were covered with them; and so clear did they keep the air, as they darted close about me, that there were no insects left to attack the inhabitants, except those protected from the bats in the bed-rooms of the families. I supposed the whole population was sleeping, but it was not so. As I walked slowly round the square, when I came to a creole's house, silver and gold coin were heard to jingle on the inside of the door-way. The silent dealing of cards was going on; bets were being made by counting out the coins. The creole portion of the population were gambling. As the comisario struck one by the bell at the cathedral, the working population slept. Indians have no time for such occupation; their games are played at the weaving-frame and sugar-field. The supply of bread-stuff is drawn from the laborer of the plains of Mojos; the silver is chiselled from the rocks of the mountains by the Indians; and yet the most intelligent people of Bolivia ask how it is there is so much progress and improvement in other parts of the world and so little in Bolivia.

The creoles of Trinidad are from all parts of the country. We never beheld such a rough-looking set—seemed to be the very outcasts of the nation. There are few married people among them; some of the men may have wives and families on the Andes, but they live here without them.

The creoles dress in calicoes and silks, straw hats and leather shoes, with silk stockings. They prefer the foreign manufactured goods to the white cotton cloths of the Indians, except for the table or hamacs, and towels, which the Indians make to perfection.

The Indians seem to take pride in acting as servants. They cook, wash, and bring firewood to the whites for a trifle.

On the morning of the 17th of June, the prefect made up a party, inviting a Brazilian, an Englishman, and myself to join him in a visit to Loreto, twelve leagues south-southeast from Trinidad. Our horses were small, but in good order, though badly broken. It is the custom to lasso a horse in the pampa, saddle, bridle, and mount him. Should a man be thrown, no harm is done; he lights on the grass or in the mud. Indians had been sent ahead by the prefect, at daylight, with our bedding, and table furniture,. The day was clear and pleasant as we rode along the level road over the prairie. One of the comisarios led the way on a little stunted mule. He rode well, with his big toes touching the large wooden stirrups; his legs and neck were bare; a scarlet skull-cap on his head, and white camecita wrapped gracefully round him. He made quite a picture galloping over the plain, which was spotted with clusters of bushes, palm trees, or a pool of clear water. Here and there the view was uninterrupted, and the eye fell upon a clearly defined grassy horizon. A wooden bridge in the road proved so much out of order, that we wet our feet in wading the lazy stream, when we halted to hear a distressing story from the Brazilian, who was the life of the party. It seems the evening before a fellow countryman had sent him a couple of bottles for his saddle bags, to be opened on the road. Don Antonio examined a bottle, which proved to contain *varnish*. His countryman was a cabinet-maker in Trinidad, and had evidently made an unfortunate mistake. It was not until long after that I understood why the prefect appeared so much displeased at the circumstance. The cabinet-maker had some difficulty, and the prefect had ordered him to leave the department of the Beni, and go home to Brazil. Don Antonio succeeded in persuading the prefect to let the man take passports for the department of Santa Cruz, as he had been a number of years in Bolivia. Owning property in both places, he was obliged to sell out at Trinidad at a great loss, and had the prefect insisted upon his

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going directly to Brazil, he probably would have lost what he owned in Santa Cruz. The prefect believed the cabinet-maker had sent the bottles of material used for mechanical purposes, instead of those for medicinal, on purpose to varnish him. The honest mechanic, it is supposed, took this opportunity of showing his ill-will towards the authorities, who have orders from the supreme government not to be too smooth with *foreigners*, but to send them to Brazil immediately upon the least suspicion of misbehavior. Liberty, property, and even life hinge on the will of the prefect of this department. The power of the prefects of all the other divisions of the territories in Peru and Bolivia are great enough, but none are so far from the eye of the government as this, which is geographically independent of the mountainous regions. The authorities have unlimited powers, over foreigners particularly.

Four leagues travel brought us to a hacienda; we dismounted, after having toiled through herd grass, mud, and water up to the horses' knees. The water is gradually drawing off the lands, it has settled among the grass, and now is perfectly transparent. For miles we waded through it a foot deep; then the land swells up and becomes dry. Where we find water, there fowls are in great abundance—flocks of ducks and long-legged cranes. As we rise on the dry soil, deer start from our path, and the ostrich walks slowly off, holding his head down below the tops of the grass, as though we did not see his tail of beautiful and valuable feathers.

The two houses at the hacienda were surrounded with plantain and papaya trees. There were several enclosures for cattle, one of which contained a great number of calves; they, with the Indian women and dogs, had used up all the morning's milk. The Englishman, therefore, drew the cork of a bottle of wine, the prefect produced bread, but cheese had been left behind. A large pot of beef was boiling on the fire; it was so tough and insipid, for the want of salt, we could not eat it; while the "peste" remains, we doubt whether it is healthy food.

After leaving the hacienda, with its two-storied houses, we waded one league through water two feet deep, spread all through the grass on the plain as far as we could see in every direction. Birds of most beautiful plumage flew up about us, and the party became pretty well ducked. We would have done much better in canoes than in saddles. Reaching dry land we pushed on foot, in single file, to the river Yvaré. An Indian from the opposite side obeyed the call of our guide. The horses were unsaddled; we all embarked with the riding gear in a canoe and paddled over, as the horses swam to the opposite bank. While the Indians saddled up, we bathed in the stream with the greatest

number of snorting alligators above and below us. The stream is narrow, without current, making it difficult to tell which was up or down. The banks were twenty feet high, and yet they are overflowed in the wet season. The water was dark colored, though clear.

At the house of the ferryman we met his old Indian wife, who cultivated a few cotton-bushes about her hut, with some tobacco plants. The cotton is produced from a bush eight to ten feet high. It is difficult to find a person who has noticed how long these bushes will produce without replanting. The impression is seven years. The same tobacco plant yields from two to three years. The hut was shaded by a number of orange trees, from which the woman gathered us most delicious fruit. There is nothing like them on the coast of Brazil nor at the Cape de Verde islands. The skins are thin, almost bursting with the juice. The trees were as large as a moderate-sized apple tree, and loaded with oranges, while the sweet blossoms bloomed for another crop. Plantains form the bread of this country; near every house the trees are found. This hut stands on the northern boundary of what are called the Plains of Loreto. Here the land is somewhat higher; the path is smooth, and as the afternoon is passing, we hurry on. To our right a drove of cattle look up; fierce-looking bulls stand between us and their mates; they are not very amiable fellows, and often attack the lonely traveller; but their numbers have been reduced by the thieving creoles from Santa Cruz, who come here and take them off by droves. There was a time when sixty thousand head of cattle were counted on these plains. As the doe leaped through the grass, following its young, the peccary—a sort of wild hog—jumped up under the horses' noses, and with his civilized grunt and short tail, rushed along the same path. Tigers are found in great numbers; their skins are sold in the market of Trinidad. As we rode by a cluster of trees on our right, we heard a bellowing bull, and saw the wild cattle rushing to his aid. I was told the tiger leaps from his hiding-place in the grass, catches the bull by the ear, fastens his fore-claws securely in the neck and his hind-claws to the fore-shoulder; his head is then just behind the horns of the bull, and his tail hangs down by the side of the fore-leg. In this position the tiger commences to cut into the great vessels of the neck, while the bull runs through the pampa, his head high up in the air, bellowing with pain. Unless the herd who follow to help, gather round and attack the tiger, he soon brings the prey upon his knees. The suffering animal bleeds to death surrounded by his kind, while the panting tiger prowls about at a short distance, knowing that when the bull dies the cattle will disperse, and he can then enjoy the feast. These tigers sometimes

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attack a man when he is alone, but seldom when in company. Few persons escape when engaged in the death-struggle with him. The Indians usually go together, or take dogs along, who attract his attention, and prevent his seeking an engagement with the man. The tigers make dreadful work among the calves when they are allowed to go abroad in the grass. They are generally kept up in the day and watched by the Indians and dogs. At night they are put with their mothers in an enclosure, where a tiger dare not go. His only chance of killing cattle is between the time he catches and when the herd come up to the sufferer, who rushes off at full speed the moment the tiger touches him. The work of death is speedily done.

As the sun was going down, we came upon a plain stretching far off to the west. Deer were grazing in pairs. We all put spurs to our horses and gave chase, but they showed their white tails and bounded out of reach of a rifle. The horses soon became worried down running through the grass. The tapir, or Brazil elk, is found on these plains, keeping close to the river. It is called "gran bestia" by the Spaniards. Its color is iron gray, with a short coat of coarse hair. The meat makes very tender beef. The hoof is divided into three parts like toes. On the inside of the fore-foot there is a fourth toe; and the hind legs double up at the joint like those of the llama and elephant. The strength of this animal is very great. The Indians sometimes lasso him, but take care not to have the end of the lasso fastened to the saddle, as is usual, for the tapir will manage three or four horsemen with ease. The tapir lives on grass, and although he is harmless, the Indians are excited upon meeting one, as though they feared the animal's strength. He can only be taken by a ball or arrow. Although his skin is thick, he is not very difficult to kill. In Brazil there are great numbers of these animals. The Indians say the tapirs and the mules are cousins, because their heads somewhat resemble each other when looked at full in the face. The tapir holds his head about as high as a mule; his hinder parts are more like the elephant.

Night overtook us amidst the beasts of the prairie. As the road was reported dry by the guide, we galloped in a line for a long time through the silent plains, and finally reached the small town of Loreto. On the outskirts we passed enclosures filled with cattle. It was after eight o'clock, and the inhabitants had gone to bed. A death-like silence reigned as we dismounted at the door of the government house, where Indians had already arrived with our beds and provisions.

The correjidor was a fine-looking Indian, dressed in jacket and trowsers, becoming to him. Being of domestic materials, he was more at

his ease than those who get into tight-fitting old cloth clothes. Bedsteads, chairs, and tables were put into different rooms, with jars of fresh water. Indians came rubbing their eyes, and, looking at us, smilingly offering to assist the correjidor. A fire was kindled, water heated, and a first-rate chicken soup made, while the cotton hamacs were slung across the room. A white table-cloth was spread; after soup, coffee was produced, and the party rested in the hamacs, with home-made cigars.

The day's ride has been a fatiguing one. The motion of a horse wading in water is unpleasant and harassing, both to man and beast. This journey to Trinidad cannot be made on horseback during the rainy season. The roads are navigable for canoes half the year, when travelling is much more easy than when the season is called dry. The Indian builds his hut on those elevated places which remain islands; when the great flood of waters come down, crickets, lizards, and snakes crawl into his thatched roof; droves of wild cattle surround his habitation. Armadilloes rub their armor against the pottery in the corner of his hut, while the tiger and the stag stand tamely by. The alligator comes sociably up, when the "gran bestia" seats himself on the steps by the door. The animal family congregate thus strangely together under the influence of the annual deluge. Those of dry land meet where the amphibious are forced to go, and as the rains pour down, they patiently wait. Birds fly in and light upon the trees and top of the hut, while fish rise from out of the rivers and explore the prairie lands. The animals begin to seek a place of refuge in the month of January, when the soil becomes gradually covered. As the waters subside in March, they spread out over the drying earth, and pasture upon young grasses, which spring up upon the passing away of the flood. At these annual meetings of the beasts, birds live upon fish and upon each other. All the carniverous animals, man included, fare the best; while horned cattle, tapirs, deer, and horses suffer for want, and become an easy prey. As the fluctuation is uncertain, many are drowned, or die from exhaustion in running about with the water up to their chins, out of sight or reach of shelter.

The Indians of Mojos are not friendly to the Spanish race at heart; that they love and respect the influences and arrangements of the church there is no doubt. The Indians of Loreto are of the Mojos tribe, and are remarkable for beauty and intelligence. The men are very independent. One of the most wealthy went to his chacra, while the prefect was here, and remained there, not only because he disliked him, but all the creole race.

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Loreto has somewhat a ruinous appearance. The streets and plaza are filled with grass, on which hogs, goats, and sheep pasture. A small stream runs close by the town, and supplies the people with water. A wooden bridge is thrown across it, over which the Indians pass to their chacras. There are but few creoles living among them. The population is poor, and the hospital filled with cases of small-pox. While walking through the town we saw too men evidently affected with consumption—one of them a silversmith. We met an old woman ninety years of age, without teeth, her hair as white as snow; she embraced us all. Don Antonio returned the compliment with so much warmth, that the old woman's life seemed in danger, to the great amusement of all the young girls.

There were a number of cases of chills and fever, one of them a black man. There are said to be about two thousand fugitive slaves from Brazil in the territory of Bolivia. By the first article of the last constitution they are free and equal with the white people the moment they enter. The negro of Brazil, in Bolivia, has more rights and privileges granted to him by law, than the Indian on his own soil.

We visited an old Indian woman with a house full of daughters; these Indian girls are beautiful and much respected; several of the creoles have desired to marry them, but the father is displeased with the whites, and refuses to permit his daughter to marry any but a man of their own race. The house was furnished better than any Indian's house we had met; their beds were neatly curtained; floors partly carpeted; neat white hamacs and table cloths. One of the daughters was decidedly beautiful; her complexion white and clear, with regular features; her eyes large and deep black, like her hair; she was of middle size, with a most perfect figure; hands and feet exquisitely shaped, and teeth perfectly white; her manner was modest and shrinking, while, at the same time, she spoke Spanish remarkably well; attention had been paid to her education. This family of Indians were more respected by both white and red than any other in the Beni; yet the father would have as little to do as possible with the authorities. He was a leading man among the Indians, and did not hesitate to make them acquainted with his opinion of the wrongs every day practised against the tribe. We were unfortunate in not seeing this man; upon inquiring, it was found he would not remain at his farm, but was visiting about the country among the Indians.

Near the town there is a grove of large tamarind trees, planted by the Jesuits. Under the shade of one of them some carpenters were

hewing a large canoe, like the one we descended in from Vinchuta. When complete, it will be worth from thirty-five to forty dollars.

The floods rise up into the streets of Loreto, and the church floor is so damp they have commenced a raised foundation for another alongside of it.

The southeast winds were exceedingly raw and wet during our two days' stay at Loreto, so we had a poor opportunity to see the inhabitants. They keep their houses during these cold, damp days; such weather is the most pleasant for travelling. We returned to Trinidad by the same and only road, which continues on to Santa Cruz, through a wild country.

In the month of June, sometimes fresh winds blow from the northwest, over the bottom of the Madeira Plate, veering often to north and northeast; but this is seldom the case. When the wind is from the northwest, the thermometer ranges at 82° in the morning, and as high as 90° in the afternoon. Although the dust is very much disturbed by it, the population sit out of doors in the calm, clear evenings after the wind goes down with the sun. This wind seldom exceeds three consecutive days; it then changes, and blows from southeast, rather lighter, but brings fogs. Rain falls from the clouds; and, in the latter part of June, during these winds, the thermometer falls as low as 66° in the morning and 70° in the afternoon. The natives then shut their doors, and keep in from the street; their cotton camecitas are doubled, or one of bark cloth put on. The Indians suffer for the want of proper clothing; they shiver, and are perfectly helpless until this wind changes to the northwest, when the town becomes enlivened again—the southeast winds being wet winds and the northwest winds dry. These two currents appear to be struggling against each other. The northwest winds appear like water-carriers going back with dry buckets; as they pass the town of Trinidad, the southeast winds are pushed out of the way, and after they have passed, then the southeast winds come up like a train of watering pots, and down drizzles the rain, and the dry atmosphere, as well as the hot soil, becomes cooled and watered. The rains are seldom heavy in the month of June, nor are the winds strong except in puffs from the southeast. We have never witnessed such regularity in the distribution of heat and cold as we find in the Madeira Plate. The dry and wet winds are independent of the dry and wet seasons. The trees here ripen their fruits, while, at the same time, they put forth fresh buds and blossoms. Vegetable life goes on in rapid succession, and seems to be as regular as the year in and out. In the month of July, the southeast winds blow a little fresher, and sometimes veer round to the southwest.

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The northwest wind often commences to blow light from northeast and north; and in this month the wind from northwest is much fresher than it is in June. They come back as though showing some temper at the manner in which the southeast winds crowd up. While the northwest winds blow, the thermometer ranges at 76° in the morning, and 82° in the afternoon. The northeast winds are warmer than the northwest winds, both being dry winds. During the southeast winds the thermometer sometimes stands as low as 62° at 9 a. m., and 67° at 3 p. m. The southwest breezes are generally a little warmer than the southeasters, with lightning flashing among them—both wet winds. After a fresh wind from southeast, we may expect one from northwest; this wind appears very fighty at times.

In August the northwest current often increases to a gale in the struggle with its opponent, and the thermometer rises as high as 80° in the morning, and 90° at 3 p. m. When the wind from the southeast gets the upper hand, it knocks down the thermometer as low as 73° at 9 a. m., and 81° in the afternoon.

These winds sometimes blow for three days from the southeast, and then exactly three days back from the northwest. This is so frequently the case that the inhabitants say that, when it commences from either point, they expect the same wind for three days. On several occasions we were struck with this phenomenon, and whenever the Sundays happened to be calm days, the fact reminded us of the commandment for periodical rest.

Mojos invites the zoologist. The different habits of the bird kind, from the ostrich to the most delicately shaped humming-bird, are observed with great interest. The ostrich lays its eggs in the thick grass on the dry plain; two eggs fill a man's hat, and weigh as much as two pounds each. The ostrich lays a great number, spread out in the nest over so wide a space that it is very certain one bird cannot cover them all sitting, even by spreading all their feathers over them. Yet the eggs are all broken when the hatching is over, and the young have left the nest. The ostrich is so wild, it is difficult to become well acquainted with its habits. The number of young that appear upon the plain do not compare with the number of egg shells found; some suppose the ostrich lays one egg for the purpose of producing, and another to feed with. The young grow very rapidly, stepping out of the eggs; their legs are enormous, compared with other parts of their system.

When the ostrich is going at full speed across the plain, his head is held erect, like the smoke-pipe of a locomotive; his body resembles the boiler, and beautiful rich feathers, which start up straight, flutter behind.

The great speed with which he passes through the level country, with the external appearance of the bird, reminds one very much of a distant locomotive, as it runs without any train attached.

On one or two occasions we started them upon the pampas; Mamoré ran very fast, and so did our horse, but the ostrich outran us with the ease of a steam-engine. While running, its awkward looking legs are thrown out on the sides in circles, so as to clear the long grass, but the body and head are carried remarkably steady. We have never seen ostrich feathers in the market of Trinidad, and believe the Indians never hunt them, though they play with them at times by disguising themselves in a tiger skin, and prowl about near them for amusement. Indians pay great deference to those birds, originally worshipped by them. It is possible that the ostrich held the same relation to the religious worship of the Indians of these low lands, as the llama of the mountains occupied among the Indians there. These Indians appear to have no particular use for the ostrich, and for that reason do not hunt them, for an Indian seldom puts to death any animal unnecessarily; he makes use of what he finds about him, and is careful not to destroy, nor to waste without need.

There are a few individuals among the creoles of Santa Cruz who understand the art of collecting and preserving the skins of birds with arsenical soap. They make their living by stuffing birds with cotton, to be boxed up and exported. The bird collector differs from the bark gatherer; he is found on the plains as well as in the woods; his ammunition is good powder, in small tin cannisters, different sized shot, and a small quantity of quicksilver. The shot are for ordinary birds. He puts a few drops of quicksilver in a small piece of paper, and loads his gun with it instead of shot. The quicksilver knocks the humming bird over, without tearing the skin, or disfiguring the plumage; it stuns, and before the bird recovers, the sportsman has him in hand. After the hunter has collected some five hundred kinds, he then becomes difficult to please; he wants the beautiful little songster who sits at the base of the Andes, and sends forth his music before the rising sun. There are many birds who feed by night, and sleep in daylight; some steal the eggs of their neighbors; others drive away the parents, feed and rear their young, or sit upon the eggs and hatch them for the rightful owner. All these birds we see around us have their regular hours for feeding, singing, bathing, resting, and sleeping.

We met a bird-hunter in Trinidad; he had been at work two years collecting near six hundred different kinds. He was of opinion there are over a thousand varieties of night and day birds to be found in the

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Madeira Plate, besides snakes, lizards, and any quantity of insects. Trinidad was his head-quarters from which he branched off in all directions during the dry season. His room was a perfect curiosity shop. The birds were rolled up in paper after they had been properly cured, and stowed away in large wooden boxes. Every day, at different hours, he went to the field; after days of labor, he would be seen returning with a single bird, differing from any in his room. He procures poisonous snakes by splitting the end of a stick to form a fork, which he places over the neck of the snake, and holds him until a gourd or bottle is fixed over his head, when he loosens his fork and the snake crawls into the cavity. He then corks the gourd and puts it into his pocket. After the snake starves to death, or is drowned in spirits, his skin is taken off, preserved, and stuffed, ready for exporting to the museums of the civilized world.

During the rainy season the bird-hunter enters a canoe, and repairs to those places where the various animals are collected together. He obtains many species there, which would require a length of time to follow up, and fills his canoe with venison and deer skins.

Longevity is not so great in the bottom of the Madeira Plate as on the mountains. We find very few old people in Mojos. The population is principally composed of middle-aged men. Women appear to reach a greater age, both on the mountains and here. They arrive at maturity about the same time in both regions.

The men of Mojos are less addicted to exciting drinks; they use tobacco in moderation, while those of the mountains are immoderate in their use of the coca. The men of Mojos appear to possess more physical strength; they are more supple and active than the mountain Indians. All agree perfectly as to indolence. The creole portion of the population of Bolivia are the most idle of the two races.

On the 14th of August, 1852, Don Antonio found his cargo could not be disposed of in Trinidad, and he must return to Brazil with his boats. Don Antonio had Brazilian boatmen—negroes and mestizos. These men came up from the Amazon with him, and were thought the only kind of people who could be employed upon the expedition.

At daylight in the morning, Cayuba came with his wife and thirty Indians, bearing poles, to carry our baggage to the port at Trapiche. Cayuba's wife brought us yuca and oranges to use on the voyage. Our passports were made out, and upon my offering to pay what was usual, the Intendente, who was a very polite person, said the government did not charge me.

The passports of Don Antonio and his twelve people cost him the

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By Lieut.t L. Gibbon U.S.N.

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sum of four dollars, for permission to return by the river Mamoré to his own country, more than half the distance being through the wilderness, beyond the line of civilization. The authorities insisted upon it; he required a Bolivian passport to present to the authorities of his own country when he arrived there, "otherwise they would not know where he came from." There was some displeasure shown towards Don Antonio, that he had not a thousand dollars in silver. He, on the other hand, was displeased at being obliged to take cacao, instead of silver, for his goods.

The prefect of the Beni gave me a letter to the prefect of the department of Santa Cruz, in case we found it impossible to get men in the town of Matto Grosso, for Don Antonio's boat to descend the Madeira, and could not pass by the forts on the Paraguay river, or over the country to the Atlantic, through Brazil. We would have a passport to return into Bolivia. It is necessary to have permission to come in as well as to go out.

Over one hundred Indians died with the small-pox while we were in Trinidad. The people were still suffering with it when we left.

Trapiche is situated two leagues west-northwest of Trinidad. The road in August was dry, but in February is navigable for canoes. The whole surface of the country is strewed with ant-hills, though not quite as high as those of Masi plains. We examined the inside of one and found the earth worked into a perfect honey crust, not regular like hived bees make their comb, but bees that burrow in the ground, and deposit their honey in a mass of cups. The inside of the ant-house was built so that the ants could enter at the base and wind their way up to the top. There was no outlet on the top; the outside was one solid mass of baked clay, burnt hard by the heat of the sun. We suppose that the ants live in the garret when the lands are overflowed; do not crawl on the outside and get on the roof for safety or curiosity. Some of these ants are small and reddish in color, while others are black. They do not sting as those of the woods, until they are made very angry, and then they worry a dog considerably.

There are a great number of large pigeons feeding on these plains; the young are full-grown, very fat, and form a good substitute for miserable beef.

The Indians carry their loads of plantains, yuca, and wood, on the crotches of two limbs. The single sticks made fast to the yoke of oxen, secured on each side to the horns, while the two prongs slide on the ground behind. Sometimes they secure a large square box or basket on the crotches, and let the children ride in this Mojos carriage. The

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sugar-cane is generally planted on the side of the river and carried in canoes. At Trapiche we found them manufacturing sugar, molasses, and rum.

I embarked in a small canoe with my gun, and a little Indian boy paddled me up the Ybaré to look at a field or patch of sugar-cane. The Indians had just set fire to the dry weeds in it, and the light breeze soon created a flame. A large black tiger rushed out on the bank, plunged into the river, and swam before us to the opposite shore, where he looked round crossly at the fire. Shaking himself, he proceeded up the bank, and through the cane-brake, without condescending further to notice us. His body appeared full five feet long, with short, heavy legs, long tail, and a remarkably disagreeable expression of face, as though he would like to take some revenge for being burnt out. The little Indian boy looked up quickly, and simply said, in Spanish, "He is a large one."

On the banks of the Ybaré we found plantains, pine-apples, papayas, Spanish peppers, lemons, and oil beans; small fish and eels in the river, with poisonous snakes in the grass.

Our baggage was stowed on board the "Igarite," over which the flag of the United States was hoisted. Don Antonio embarked his cargo on the "Coberta," from which the flag of Brazil was suspended. Five Mojos Indians were employed in addition to the Brazilian crews. Two horses and two mules affected with the peste were embarked in a canoe. Four dogs and one man crowded a small batteau. Four of the Brazilians had their wives with them. Just before the boat squadron got underway, there was trouble on board the "Coberta"—the men whipped their wives all around. After which they followed us down stream. The noise and activity in getting off was new to us. The Indians crowded the banks, while the Brazilian negroes seemed disposed to show their seamanship to advantage. We were delighted to get off.

The Ybaré is a small winding stream, of fifty feet width, with perpendicular banks thirty feet high, a depth of nine to twelve feet, and a half-mile current. A short steamboat might ascend the Ybaré from the Mamoré river to Trapiche. The turns are too short to admit a long river steamer. The Indians call this distance three leagues. There are a few snags, and quantities of musquitoes. The dew falls at night, and the new moon appears unusually red. We noticed this peculiarity at the base of the Andes east of Cuzco.

On entering the waters of the Mamoré river again, we found *thirty-three* feet water. A ship-of-the-line could float in the bottom of Madeira Plate in the dry season. The current is now one mile per hour. Temperature of water, 76°. One of the Indians wanted us to give him our compass, after inquiring what it was, saying there were none in Mojos. The banks of the river are twenty-five feet high; with the depth of the river, the bed is fifty-eight feet below the surface of the plain. The river is less winding, with a width of four hundred yards, and the channel little obstructed by snags. We progress very slowly in this clumsy boat. The men propel her about half a mile per hour when they choose. Sometimes we pole along the bank. She measures thirty feet in length, and eight feet two inches beam, drawing three feet water when loaded.

Here we meet fish. Don Antonio came alongside with his batteau and hand-net, and politely gave me one of each of the different kinds he caught in a few hauls. This was quite an addition to our collection.

The country around is a perfect level. Clusters of trees here and there spot the plain, though cane-brakes and grass predominate. The banks of the river are often picturesque, sloping down to the water, covered with grass, while in other places the large drift-trees lay on the beach, where the Indians cultivate patches of maize, earth almonds, or ground peas.

August 19, 1852.—At 9 a. m., thermometer, 80°; temperature of water, 78°. Among the heavy clouds that approach us from the south-east the thunder roars, and a rainbow comes towards the Andes. Ducks, geese, turkeys, and cranes thickly line the stream; porpoises puff and hawks screech. The boat's crew and their wives enjoy a roasted ring-tailed monkey for breakfast.

We landed on the east side on a bank thirty feet high, and visited the Trapiche of San Pedro. Four sugar mills were in motion by oxen. The Indians had collected large piles of cane from the patches, and were manufacturing rum and molasses under the superintendence of the correjidor, a creole, having a wife and children with him. We supplied ourselves with sugar of good quality for the voyage.

The same planting produces sugar for twenty years in Mojos. The suckers yield a juice which increases in sweetness for twelve years, after which it begins to loose its saccharine matter. Cacao is gathered in November, coffee in May, and sugar in August and September.

We have quantities of musquitoes during the night, but none in the day. At 3 p. m., thermometer, 91°; water, 78°. We count eighteen different kinds of fish in the Mamoré, where the river is thirty-nine feet deep. The country has become somewhat broken in places; the land is dry, and raised well up from the level of the river, while in others it sinks down swampy. We drifted along by the current during the night after getting entangled with a sawyer or run on the side of the shore.

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One of the Indians who had the "sleep in," was seated napping on the rounded roof of the barrel-shaped boat, with his head between his knees and camecita doubled under his toes, to keep the musquitoes out. He lost his balance, rolled in his sleep over and over off the boat into the river. The remarkably quick time of the man in waking up and regaining the boat, amused the old captain, who was standing forward like a figure-head, with a cigar in his mouth; now looking up at the bright moon, and then on the surface of the water for snags, both hands fighting musquitoes on all parts of his nakedness. Instead of giving the usual cry of a look-out, "Man overboard," he laughingly remarked to himself, without offering asistance—"Mucha fiesta esta noche—plenty of fun to-night.

The grasses on the prairie are fired, and as the midnight hours pass, lightning flashes to the east. The wild cattle roam bellowing beyond the ravages of the flames. Our lead here tangles at the bottom of the river and troubles us, where we find fifty-one feet of water.

August 22.—The wind from southeast freshened almost to a gale. At a turn in the river we lay by the bank for the day; the men were unable to force the boat against the wind, which made a little sea against the current, and drove us up stream.

At 9 a. m., thermometer, 77°, and at 4 p. m., 69°. August 23d rain and lightning, with a trong southeaster. We clung to the bank all night. At 9 a. m., thermometer, 62°. At 3 p. m., thermometer, 61°. The Indians became quite cold, fastened up in the boat by the side of a steep bank. To warm themselves they took out a line ahead and pulled us slowly along against the wind and sea to the next turn in the river, which gave us the wind fair. Our poles were rigged up as masts, and with old pouches and baggage covers, we stuck up a sail, which drove us along at the rate of four miles, very much to the delight of the Indians, who never use sails in their canoes. Arriving at another turn, it became necessary to take in all sail; doing so, we ran into a cluster of trees sticking fast to the bottom of the river, when the Indians laughed, and pronounced sailing a humbug.

CHAPTER XI.

Exaltacion—Cayavabo Indians—Descending the Mamoré river—Indians shooting fish—Houbarayos savages and birds at midnight—Ascend the Itenez river—Forte do Principe da Beira in Brazil—Negro soldiers—Kind attention of the commandante—Favorable notice of the expedition by the President of Matto Grosso—The wilderness—Friendship of Don Antonio, his boat and a crew of negro soldiers—Departure for the Madeira river—Birds and fishes congregated at the mouth of the Itenez—On the Mamoré river again—A negro soldier's account of the Emperor's service—Roar of "Guarajá-merim" falls.

August 24.—Arrived at the port of Exaltacion. The Indians manufacturing sugar at the mill on the bank. The largest Indian we met on the route was superintending the workmen; he measured five feet eleven inches. This is the Cayavabos tribe. These Indians are said to be the most courageous in the Beni. They are certainly a superior looking set of men.

The town of Exaltacion is situated in the elbow of the river, one mile inland, near a beautiful lake. The place was nearly deserted for the sugar patches and chacras which line the banks up and down the river, to which the Indians repair in the morning early, men, women, and children, and after the day's work is over, return to town for the night. All the towns in Mojos are laid out and built after the same fashion, and the costume of the Indians is the same, except here the women have a fancy for black, and dye their cotton camecitas of that color, which is anything but an improvement in a country where plenty of water may be had. Exaltacion stands on a dry, parched, uninteresting flat. The cathedral and government houses are superior to those of Trinidad, though this town is small and more like Loreto. The tamarind trees and orange groves planted here by the Jesuits flourish better.

As there were some cases of small pox in town, we declined the kind invitation of the correjidor to take up our quarters with him. This gentleman was exceedingly polite, and promised to give us a canoe and fourteen men to carry us to Brazil as soon as possible; Don Antonio being obliged to leave his large boats in the Mamoré river, and load his small canoe with that part of his cargo intended for Matto Grosso. Boats drawing three feet water could not ascend the Itenez river to that

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town at the dry season of the year. The correjidor gave orders to a commissario to detain a crew in the morning, before the Indians started for the chacras, so they might prepare their "farinha" for the voyage. Yuca turns green, and rots in a few days in its natural state; we will be detained some days, while the women manufacture it into farinha; it is washed, pealed, and grated into a wooden trough; after which it is ground, or mashed by hand between two stones. Maize is often mixed with it, by which it is much improved. After it is dried hard, the flour lasts long enough for a voyage of a month. Cattle are scarce on these prairies; a beef costs four dollars; the crew require one for a start, but as the meat keeps so short a time, they are dependent upon farinha, and what they may pick up on the way.

Don Antonio lost two of his animals on the passage, and from the dry appearance of the pasture, he will lose the others. The correjidor was unwilling to permit him to let them loose on the plain among other cattle and horses; suffering with the worst stages of the disease, he was fearful that they would affect those which had escaped.

In the evening we met the Indians returning from the chacras, all armed with bows and arrows. The tribes to the north are savages, and very unfriendly towards the Cayavabos, who often whip their neighbors when they misbehave themselves. They were loaded with yucas, plantains, oranges, sugar-cane, alligator's eggs, and with the only farming tool they use, a small iron shovel, attached to a long straight handle.

The sugar mill is going all night long; several pairs of oxen are kept ready, and as soon as one becomes tired, a fresh pair is hitched in; the boy that thrusts the cane between three perpendicular cogged cylinders, and the driver of the team, often fall asleep at work, but are kept at it by those put over them to keep the mill going. The mill and oxen all belong to the State, as well as the chacra, from which this cane came. After the Indians have manufactured the government's sugar and rum, then the mill is loaned to them, and their own oxen are hitched to. The fixed stipend of the Church and State officers of the Beni are paid by the income from these government sugar patches, worked gratis by the Indians under orders from the authorities.

The market price of sugar, in the town of Exaltacion, is one real per pound. A quantity of fresh juice is drank like new cider; it is called guarapo; the Indians are very fond of it. They make wry faces at aguadiente, but naturally take to chicha. An Indian always "acknowledges the *corn*." There are three kinds of sugar-cane here. The largest sized white cane is considered the least valuable; the sweetest and best quality is the small white stalk. The third kind has a dark

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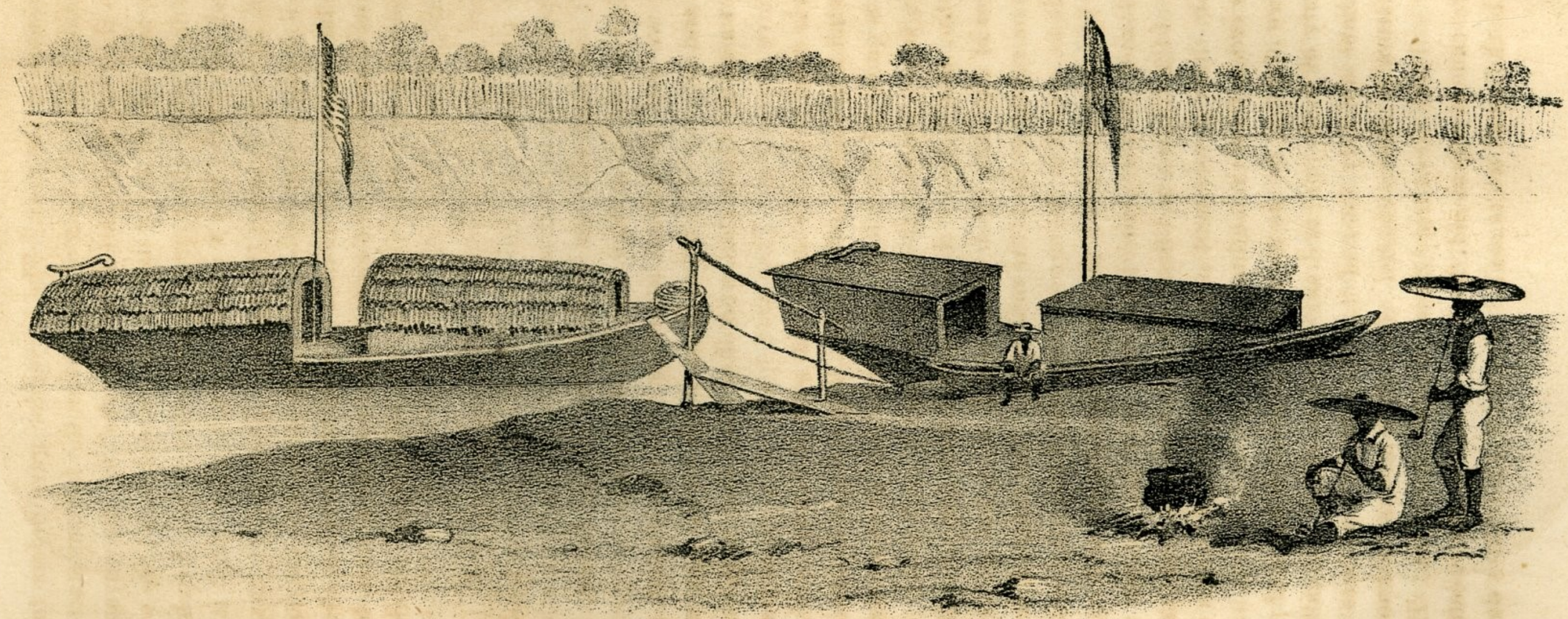

Sketched by L. Gibbon.

Lith. of P.S. Duval & Co. Phila.ª

DON ANTONIO'S AMAZONIAN BOATS. EXALTACION. Bolivia.

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bluish color, which is said to produce the best aguadiente. It is seldom manufactured into sugar, being inferior to either of the two whites. I collected cuttings of each kind.

The Cayavabo Indians are good horsemen. When they require cattle, a party mount horses and ride into the pampa, where they encounter the wild cattle. They ride round them in the most skilful manner, run them into an enclosure; from the outside of the fence they lasso a beef, and haul him to a bull-ring fixed in a post. Tame oxen are kept and fed near the place where the beef is butchered. The horns of a wild bull are sometimes secured to those of a tame ox, when they are let loose on the plain. The ox knows the road, and naturally runs to the place where he is fed at the market, and holds his wild brother, while the Indian puts him to death.

The boat's crew were mustered by the comisario, and in the presence of the correjidor, I paid them our passage money from Exaltacion to Forte do Principe da Beira, in Brazil, with the express understanding, that in case there were no men there for Don Antonio's boat to take me to the Amazon, they would continue with me to the town of Matto Grosso. It appeared very evident that the Indians disliked leaving the chacras, preferring much more to remain and gather their harvest than go on this voyage, which is seldom made by the Bolivians. They were fine, stout built men, and reported to be the very best crew belonging to the tribe. The correjidor gave them instructions to do whatever I desired of them, and to take good care of us, as we came down the mountains from where the President lived. He was also kind enough to give me the choice of all the canoes in port; the largest and best one measured thirty-nine feet long, by four feet three inches beam, and would carry, besides the crew, one thousand pounds weight; the paddles were five feet long.

The correjidor presented a raw-hide box filled with jerked beef—charque, as it is called—some corn bread, and farinha. The superintendent of the mill sent a jug of molasses and some of his best white sugar. We had appointed the 30th of August as our day of sailing, when the crew came down, headed by their captain, to beg we would allow them to celebrate the Fiesta de Santa Rosa, when mañana—next day—they would be ready to start. As there was dancing and an unusual encouragement of the chicha manufacturers in town, I saw there was no chance of getting off, and very unwillingly gave consent.

While we observed the northern stars for latitude, several Indians came to look on. Being shown the image of a star in the basin of mercury, they appeared astonished, and inquired of Don Antonio what

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we were doing. He told them we lived in the north, and were inquiring of the stars how far from home we were in their country. The fellows ran off immediately and called others to come and see the North Americans' home under the stars. One of them looked intently for some time at the little twinkling image in the quicksilver, and gravely told the others "it was far off."

August 31.—The crew came down to the canoe, bringing with them their farinha and women; this was a favorable sign for our getting off; the captain, however, came to me and said he was very drunk, and thought it best to put off our start until to-morrow; but the men were generally sober after their saint's day; stowed our baggage neatly in the canoe, kissed their children, and shook hands with their wives; one having been married lately to a good-looking Indian, cried; but the older ones took the departure more easy. The captain had a pretty little daughter of twelve years of age, with whom he seemed very loth to part, though he promised her to me as a wife when we returned. The "cacique" of the town came down with the men, and superintended the loading of the canoe. When we were all ready he made a speech, telling the men what their duties were, and wished them a safe return to their families. Each man stuck his bow and arrows, feathered-ends up, near by him, between the baggage and the side of the canoe, as they took their seats. We presented quite a "man of-war" exterior. We pushed on down stream at rapid rate, leaving Don Antonio to follow to-morrow. Our canoe had a washboard all round her of six inches breadth. We found our load, with crew, brought her down so deep we took in water. The captain ran alongside of a perpendicular clay bank, with which we caulked ship. We passed several canoes loaded with sugar-cane, from the chacras on the way to the mill.

The river holds about the same width—four hundred yards, fifty-four feet deep, one mile and a half current per hour. We remained all night at the port of San Martin—the lower port of Exaltacion. The bank is thirty feet high, and steep. The distance from the town is not quite a mile, but the conveniences for landing at Trapiche are the best. The men asked permission to go to town and spend the night, promising to return by daylight in the morning. The captain's wife appeared with a jar of chicha; and after the fire was made, supper over, and beds made upon the bank, they went to town, and we slept upon the shore near the boat. There was a house on the bank, but it was filled with chickens and dogs, who were scratching themselves all night. The fire on the shore disturbed an ant's nest, and they gave the party some tronble; they stung Mamoré most unmercifully. We received another

present of fruit from the correjidor, sent to meet us here, with his farewell compliments.

September 1, 1852.—The men came down strictly to their promise, and we at last got off, but it is dreadful slow work wading through this country; a man only worries himself who pretends to hurry—poco-poco is the word in Spanish. A few miles below San Martin we came to a stony point, the first rock we have seen since leaving Vinchuta. We take specimens of rocks, metals, minerals, and earths, as we go along. By the river we find chocolate, coffee, sugar-cane, papàya, plantains, pine apples, yuca, large straggling forest trees, thick undergrowth, but no inhabitants. The Indians all sleep in the towns, and work by day in the chacras. The largest cacao leaf I could find measured one foot six and a half inches in length, with five inches and three-quarters in breadth. The cacao tree grows wild in the woods; when planted in an orchard by themselves, even close together, the yield is much greater than where they grow in the shade of the larger forest trees. The soil here is of the richest kind.

At 9 a. m., thermometer, 88°; water, 79°. The turns in the river are becoming much longer; we find sixty-three feet water. With a gun, we landed on the west bank, and paid a visit to the pampa of Santiago, where the State has a large drove of cattle, attended by Indians. There are numbers of deer, and flocks of birds. The territory to the north, through which the Mamoré river flows, is inhabited by a warlike tribe of Indians, called Chacobos, who are constantly fighting with the Cayavabos, our crew. The men caught a number of fish from a pond on the pampa. My bottle, unfortunately, was too small at the mouth to admit more than one species. The banks of the river sometimes break down on both sides perpendicular, like those of the Mississippi. Where this is the case, the river is narrower—350 yards wide—though the soundings are over one hundred feet. We lost one lead and part of the line, but fortunately had duplicates.

September 2.—At 9 a. m., thermometer, 78°; water, 78°; light south-east winds; thunder and lightning during the night, with rain. The crew caught a number of young birds, and gathered eggs from the sand-beach, while the old birds—a species of gull—flew over them, cried, and darted down at the Indians' head as they made way with the young. Mamoré was let out among them. As he put his paw playfully on a young bird, the old ones were in swarms close over him, showing desperate fight in defence of their young. The sand is gray and black, like the rocks we saw yesterday. There are a few snags and sawyers in the

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channel. We observe they stick fast in the sandy bottom more securely than in the mud.

While we breakfasted on young birds and eggs, wild cattle were seen on the opposite bank of the river. These cattle have roamed down to the territory of the savages. A number of palm-trees stand on the banks, and the country appears to be getting more thickly wooded. An alligator had driven a school of fish close to the bank, and, in the most comfortable way possible, was making his breakfast. The fish were crowded together; they could not clear themselves from one another so as to swim away. The alligator took full advantage of the difficulty. Our crew saw what was going on some time before we rapidly neared the school. The captain steered the canoe in about three feet of the bank, cutting between the alligator and his mess. In an instant a broadside of arrows were fired by the crew; nearly every man struck his fish. The fish were so frightened that numbers jumped out on dry land, and several leaped into the bottom of the canoe. The Indians laughed; became excited; kept on shooting. Some jumped on shore and secured the game; others ran up the bank, firing their arrows through the crowded school. One man stripped himself, jumped into the stream, and gathered in the quivering arrows as they floated down, the feathered ends up, and struggling fish on the points. The crew were most active and perfectly delighted at the number of fine fish they had to help down their farinha. While the men broiled fish on sticks and over hot coals of fire, or made a chowder with yuca, the alligator indignantly rested on the opposite shore, now and then slowly wagging his tail as he cleared the fish-bones from his teeth, but constantly eyeing the long, low, black canoe and the happy crew as they seated themselves laughingly about the boiling iron pot. The fish were the size of a small shad, shaped like them, except in mouth, and quite as good eating. Our fears of starving in the wilderness are overcome. We can travel a long way on fish, fowls, and eggs.

These Indians talk very little. They silently pull along as though they were sleeping, but their eyes are wandering all the time in every direction. Nothing moves above the water's surface or among the forest trees but they see it at once. They understand the habits and customs of the animals perfectly. Knowing that the alligator keeps accounts with the fish, when they see him, they are at once on the look-out for sport. They know at what time in the evening the wild turkey will appear on the bank of the river to drink before he goes to roost, and when to look for him in the morning, as he feeds by early light. The wild ducks sleep on the beach in the noonday sun; then it

is the Indian calls our attention to them. They understand the manners of the savages too. Sometimes we all sleep on the beach; at other times in the canoe. When we keep afloat, they secure the bow of the canoe to a stake run into the sandy bottom. When night overtakes us, we pull silently along, until it becomes so dark that no one can see us come to for a rest. Our paddles are in motion again before the break of day, to avoid being caught asleep by others. In this way the chances of being fired into by the arrows of the wild men are pretty certainly reduced to broad daylight, when we take mid channel.

Our crew know tolerably well what parts of the country are populated, and when there is a probability of meeting their enemy. We find the party depending entirely upon the judgment of this aboriginal race, who are a generous set of fellows, constantly offering to share their game with us. We return the compliment when we can, but there are more fish than turkeys. The men tell me that the Chacobo savages inhabit the west bank of the river, and a tribe called "Houbarayos," the most unmerciful, live on the east bank; therefore, we are between two fires. The soundings taken the second day from Exaltacion were one hundred and two feet deep—the very bottom of the Madeira Plate. We have reached a rocky formation passing through it, and beyond it the soundings decrease. Rocks stand up in mid-channel where we find forty-five feet water; while it requires more careful navigation, the river is 400 yards wide, with plenty of room for a steamer to pass.

September 3, at 8 a. m., thermometer, 72°; water, 78°; wind, southeast. The night was foggy. As the day promises to be clear, we break out our cargo, wash out the canoe, and restow. The internal arrangements are the same we had on board the Canichanas. We passed the mouth of a small stream emptying into the Mamoré from the eastward. During the rainy season this stream is navigable for *canoes*.

September 4.—We find small creeks running in on both sides of the river. After passing about five miles of rocky banks, the country becomes more and more thickly wooded. We breakfast on young gulls and old green parrots, the latter very poor living, even when made into soup. The men dip their fingers into the pot; the captain carries along with him a spoon made of horn, which he carefully wipes on the tail of his camecita before taking his seat at breakfast. He reclines on the bank while the others prepare the meals, after he has waited upon the "patron," one of the men appears before him with a cup of water, or light for his cigar. The crew never sing or whistle on a voyage like this; it is generally understood such noises *disturb* the savages. They quietly laugh at monkeys at midday, and joke the

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old geese as they trot along the beach with a brood of little ones. When the wind blows from the southeast, the men shiver and shake for the want of proper clothing, and work much the best when it blows from the northwest, under a clear hot sun.

At 9 a. m., thermometer, 78°; water, 77°; wind southeast. At 3 p. m., thermometer, 80°; water, 78°; wind northwest; lightning to the north. The Indians decorate their hats with the green and scarlet feathers of the parrots shot. Current of the river one mile and a half per hour. We came to a shoal in the middle of the river where the channel was only fifteen feet deep; parties of small seals barked at us, and the men saw a "Gran Bestia" looking out from among the foliage. The woods are cut up in paths made by these heavy animals, who come down the banks to drink in the river. The alligators make use of the ends of the paths to bask in the sun. Tigers are not particular about keeping in the old beaten track, but roam through the grass and bushes after the scent. The Indians shot a number of fish to-day. The Mamoré is well supplied with animal life—though the alligators are small, there are great numbers of them.

After dark, a pole was stuck in the sand on the east side of the river, near a flat beach, which extended some distance back from the water, perfectly clear of vegetable growth. The bow of the canoe was fastened to the pole, and she swung to the current of the stream. We were trying to sleep, but the musquitoes disputed the question with us all. At midnight, some birds roosting on the flat began to fly up and cry out; in an instant every Indian silently raised his head, and while looking intently towards the beach, they all laid their hands on their paddles. The screaming of the disturbed birds became more general, and those nearest us began to take up the cry of alarm. Mamoré, who was lying on the baggage, uttered a sleepy growl, when the old captain whispered to me, that the savage Houbarayos were approaching us. The stake was pulled quietly in, each man inserted his paddle deep into the water, and with a powerful pull together, the canoe silently glided into mid channel. As the current carried us rapidly down through the darkness, the men were ready with bows and arrows, and we with fire arms. No noise was heard above that of the screaming of the birds; we could not see any enemy, but the captain and crew said they saw several men. These fellows are not easily entrapped; we were struck with the admirable order with which they handled their canoe, and were ready to return a shower of arrows. They watch closely the movements of all animals; could tell by the alarm cry of the birds that some one approached, as they knew the difference between the

notes of a bird disturbed by man, and those sounds produced from other sources—wild animals, or one of their own feather. They tell me that some of their tribe were robbed and murdered by these savages during the night while encamped on the bank in this neighborhood, and that it is best to remain in the boat all night. We drifted down the Mamoré, and before the break of day, under a bright moon, turned up into the Itenez river, which divides the territory of Bolivia from the empire of Brazil. The crew hug the Brazil shore where there are no inhabitants, and paddle with a will against an half mile current. Here we are forced to turn away from the direct road towards home, for the purpose of procuring the means of getting there. The boat we are in is unfit for the navigation of the Madeira, between us and the Amazon. This valuable crew of civil men are inexperienced beyond their own country. We must now grope our way among the Brazils.

I had thought, while detained in Trinidad, we should have had a few good North American carpenters and seamen along, to build a boat and launch her on our way to the Atlantic, but last night's experience taught me to believe I was mistaken; unless sailors understand the cries of birds better than I do, we might have all been cut off in the darkness of night, before the rising of the moon. These Cayavabos Indians are good fellows; they say very little, and keep thinking as well by night as by day. I asked the captain if he was certain we were in the Itenez river? "I don't know, patron, but," said he, "that is the land of Brazil," pointing to the east bank, "and this is the way to Matto Grosso."

The Itenez river varies in width from four to six hundred yards, with white sandy bottom and shoals. The color of the water is clear dark green; half a mile current, with a winding channel, through sand flats, decreasing from thirty-three feet depth to six feet. Seals and river porpoises are in great numbers, while the shores are lined with water fowl.

At 9 a. m., thermometer, 80°; water, 82°. The difference between the temperature of the Mamoré and Itenez is 4° Fahrenheit. The Brazil water is clear and green, with white sand bottom, while that of Bolivia is muddy, and of a milky color, with grey sand and clay bottom. The muddy water is the best; we are all complaining of pains after drinking Itenez water; it bears a bad character among the canoe-men.

The country is low and well wooded; the banks overflow in the rainy season; the foliage on the Brazil side of the river is the richest green; the dew at night is quite heavy, and during the calm days the sun is oppressively warm. At 3 p. m., thermometer, 86°; water, 81°. After night we secured the canoe to a stake on a flat in mid channel. Soon after we fell asleep, a tiger came to the bank, and while smelling the

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party, growled fiercely for some time; we were then kept awake by the musquitoes which swarmed about us.

September 6, 1852.—Our paddles were dipped in the river at 4 in the morning watch. The men get out of the channel, and often run the canoe on the shoals. The thermometer dipped into the water near these sand flats gives 88°, showing the difference of 7° between the slack water of the river, and that in the middle of the current, which varies in its speed from half to one and eight-tenths of a mile per hour: The bed of this river is very uneven, few snags, but in some places we find rocks along the bank, and standing up in mid channel. At 8.30 a. m., thermometer, 85°; water, 81°; clear and calm. The foliage and grasses extend down the sloping Brazil bank into the water, and the palm trees loom up above the tops of other trees, while on the Bolivia shore the bank breaks down perpendicularly, with a large growth of forest trees. Before sundown, we came in sight of high land to the southeast. We are now approaching the eastern side of the Madeira Plate; the hills appear beyond the flat country like islands at sea.

September 7.—We are disturbed all night by musquitoes. The heavy dew falls upon the crew as they are sleeping in mid-channel. Fifteen of us pass the night in a space thirty-nine feet by four, which is rather close stowage, with a dog in the middle. At 9 a. m. breakfasted on the rocks, by the Brazil banks, upon turtle and alligator eggs, with chicken gull stew. Two small creeks empty into the Itenez from the Brazils. We came to rapids where the bed of the river was very rocky. There are fewer fish in this stream than in the Mamoré; some of those caught are very curious in appearance.

As the men forced the canoe through the narrow rapid channel, they shouted the news that *Forté do Principe da Beira* was in sight. We could see the flag-pole and the upper bastions. Its situation was commanding. A steamer of less than six feet draught could ascend to these rocks, which are four miles from the fort, but no farther at this season of the year. The rocks are so low that many of them are overflowed during the rainy season. The crew had some difficulty in forcing the canoe up among the rocks; the current rushed through narrow channels with great force.

As we neared the fort our small American ensign was supported by a Cayavabo arrow in the stern. We see soldier people rushing about as though they had been suddenly awakened from sleep or surprised. A canoe came down to meet us with two armed *negro* soldiers; one of them politely gave his commander's compliments to me, with the request that we would keep off. As this appeared warlike, I sent my compli-

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By Lieut. L. Gibbon. U.S.N.

BRAZIL SHORE OF THE ITENEZ RIVER.

ments to the commander that we would remain by the rocky island in the middle of the river until he read a letter from the Brazilian minister plenipotentiary in Bolivia, which I sent him by the negro sergeant. Two old bald-headed negroes came, by order of the commander, to inquire if we had any cases of smallpox on board, saying, if not, the commander invited us to land at the fort. One of these negroes, fully supplied with smiles and white teeth, was the surgeon of the post; the other, with broken spectacles, was the armorer, who, together, seemed to be the health officers of the post. We had never seen people quite so black.

As we landed, a young negro lieutenant in the emperor's army came to meet me, and offered, in the most polite manner, to escort me to a house in town. There was a shed in sight on the bank, which was the guard-house. As we passed, there was so much pulling at white trousers and blue jackets, it was evident the negro soldiers had been hurriedly dressed; the officers had their hair curled extra. While they respectfully saluted Uncle Sam's uniform, we noticed, for the first time, how very awkwardly the negro handles the musket. As we rose upon the forty-feet bank there stood the fort, pierced for fifty-six heavy guns, pointing in all directions towards a perfect wilderness. The view down the river as well as up is very impressive. The soldiers wear leather slippers, and a hat manufactured wedge-shape, probably that the rays of the vertical sun may be split as they fall upon the negro head.

Some paces north of the fort were a few wretched little negro huts, in which the wives of the soldiers lived, and where a part of the force was permitted to sleep, by turns, during the night. One of these huts was offered to us; it contained one table and two chairs; was built of cane, plastered with adobe, tile roof, with rat-holes in the corners of the floor. The chairs were set out at the door, and Señor Commandante Don Pedro Luis Pais de Carvalho came to pay us a visit. He was a thin, middle-sized, dark-complexioned Brazilian, above fifty years of age, exceedingly mild and gentlemanly in manners; at once apologized for the general order throughout the empire, prohibiting the commanders of all fortifications from inviting a foreigner inside the walls; he said that the president of the province of Matto Grasso, under whose jurisdiction the Forte do Principe da Beira was, had instructed him to be careful the smallpox was not introduced among the soldiers from the department of the Beni, which was the cause of our being requested not to land. I told him we were anxious to go from the fort down the Madeira river, and asked his opinion of the practicability of making the journey. He said the president of the province at Cuyaba, the capital, who was a French

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naval officer, with the rank of captain of frigate, had ordered him to do everything in his power to assist me; the only boat fit for the service in the port was a small one belonging to a citizen, whom he daily expected from Bolivia—my friend, Don Antonio—and it was possible we could get that, and he might supply a crew from his small force of forty negro soldiers.

The commandante assured me there were no boats at the town of Matto Grosso, such as are used for descending the Madeira river, and the chance of getting men there was very uncertain. The voyage up the Itenez, from the fort to that town, would occupy over a month. I found our only hope was now vested in the kindness of this Brazilian officer, and of Don Antonio, who had not yet overtaken us; but as he had already promised me the boat, the commandante politely offered to have her at once put in order for me. As we could swing our hamacs under the guard-shed, near the river, and better attend to our preparations there, the Cuyavabos moved our baggage up, and we took our quarters with the negro-guard, instead of among the twenty huts inhabited by black families of the station.

The walls of the fort are built of stone, in the shape of a hollow square, with diamond corners, thirty-five feet high. There are two entrances on the northwest front; one a large door-way, at which is a constant sentinel, and a subterraneous passage from the inside, leading to the bank, just above the annual rise of the river in the rainy season, or thirty feet above its present level. The third entrance is through the southwest wall, fastened by large iron-bound and double wooden doors. The trenches round the walls are twenty feet deep. In walking round the ramparts, I only saw two heavy iron guns mounted, which pointed down the river towards the territory of Bolivia. The date over the main entrance of the fort was nearly erased by the weather. We could with difficulty make out "Joseph I, June 20, 1776." The commandante was unable to give us much of its past history. The Portuguese engineers who built it came up the Madeira river from the Amazon, bringing with them a small colony, who settled here by order of the King of Portugal, and, after building the fort, moved away, leaving none but the garrison within its immense walls, which enclose over an acre of land. The stone of which it is built was quarried near by. The magazine on the southeast side, half a mile distant, also built of stone, has gone to ruin and is not used. A subterraneous passage leads from the fort to it.

The country around is low and overflowed in the wet season, with the exception of three small hills in sight, to the northeast. These are situated to the southwest of that ridge of mountains marked on the

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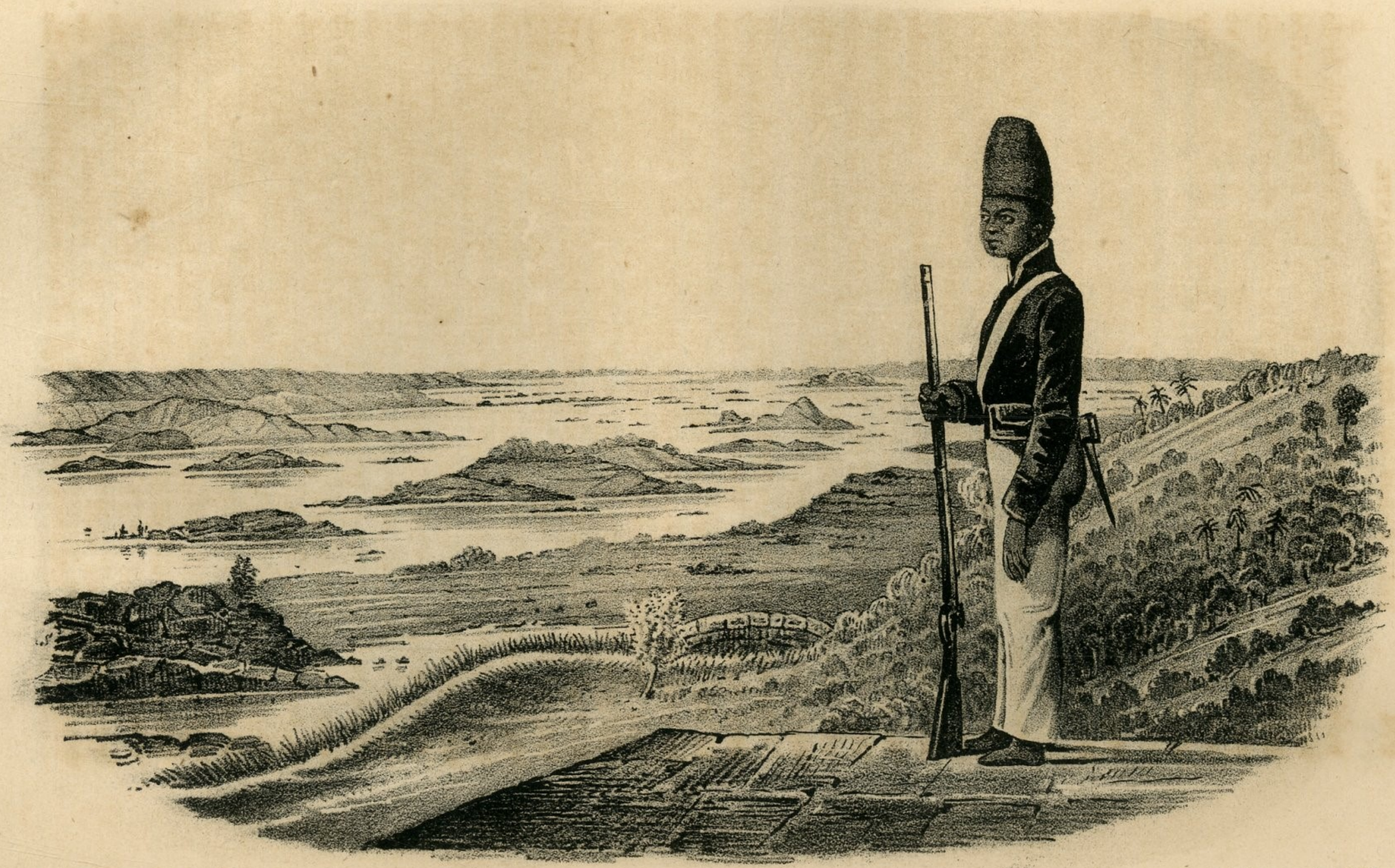

By Lt L. Gibson U.S.N.

Lith of P.S. Duval & Co Phil.

VIEW DOWN THE RIVER ITENEZ FROM FORTE DO PRINCEPE DA BEIRA, Brazil.

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common atlas—"Geral mountains." The situation of this fort is usually called "Lamego," and the river "Guaporé." There are a few wild Indians roaming about the country on both sides of the river, of which very little is known. They never make their appearance at the fort, and the commandante never troubles himself about them. He sits in his castle for months without seeing a stranger, grumbling at the cold southeast winds. His rheumatic pains are better when the warm northwest winds clear away the clouds. The negro soldiers plant sugar cane, pine apples, and produce a few oranges. The government rations are farinha, sent from Matto Grosso, and beef when they can get it from the "Baure" Indians, in Bolivia, whence this portion of the inhabitants of Brazil receive their *coffee*, *chocolate*, and *sugar*, by the rivers Machupos and Magdelina.

This side of the Madeira Plate presents a very different appearance from the Andes side. The commandante tells me he has navigated the low lands between this fort and the town of Matto Grosso, formerly called Villa Bella. The negro cook of the commandante prepared us a supper of chicken and rice. We slept comfortably and soundly in the guard-house after our harassing voyage. The Cuyavabos crew wanted to return to Exaltacion at once. I told them they must wait until we decided whether it was necessary to go on to Matto Grosso. The captain shook his head and said, no, Señor. Every man of the crew declared that the correjidor of Exaltacion had directed them to return home as soon as they landed us here. Whether this was so or not we are ignorant, but as the correjidor particularly told them before me to take us to Matto Grosso, I was curious to see what our chances would have been in case we were entirely dependent upon this boat's crew. They refused positively to go up the Itenez any further, saying they had never been to Matto Grosso, and knew nothing of the river, but must hurry back and gather their crop of sugar. They traded three raw hides for a few fish-hooks. The commandante gave them a written passport to return to Exaltacion. Their canoe was light, and they paddled swiftly down through the rocks, with the current, as though they were glad to escape a longer journey. I doubt if they could have been persuaded, under any circumstances, to make the voyage to Matto Grosso. They landed us here the seventh day out, and will be full nine days returning against the current of the Mamoré.

Every day two of the soldiers are detailed to catch fish for the garrison. Although the trip from San Joaquin to the fort can be made in three days with beef, the men say they seldom get it. The monthly mail was despatched from the fort while we were there. A small boat

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was loaded with the bags and baggage of five men and the same number of women. They all came to bid the commandante good-bye, as he sat with us under the guard-shed. He told them he never expected to see them again: he knew they all intended to desert him. But both men and women declared their intention to return. The passage is made to Matto Grosso in forty days by these mail-carriers; from thence the despatches are carried through the country by mules to Cuyaba in twenty-two days, from which place there is a regular monthly mail to Rio Janeiro. The canoe is polled and paddled up the Itenez, said to be very shallow at this season of the year, with rocky and sandy bed. It is possible, as the river rises thirty feet in the wet season, that a steamboat may be able to reach Matto Grosso from the mouth of the Itenez; but during the dry season it is not navigable for anything larger than a first-class canoe.

Don Antonio arrived and reported our crew returning. He at once had his boat fitted out and gave us "Pedro"—one of his men, who had passed up the Madeira with him—as our pilot. The commandante detailed five soldiers to take us to Borba. The boat was a small Igarite, twenty-three feet long and four feet seven inches beam. Her bottom was of one piece, cut out of a very large tree, with washboards nailed rudely on the sides, calked with oakum, and well pitched outside and in. The bow and stern, or two ends, were fastened up by a solid piece of wood, also made water-proof. She was more the shape of a barrel cut in half lengthwise, than a boat. She was strong, short, and good beam—the main objects. She could stand being dragged over rocks, sledded over the land, and worked quickly in a rapid current among rocks and sawyers. She rode on short waves securely. The soldiers were accustomed to managing boats in the rapids and among rocks by the fort, and were somewhat experienced, but they never had descended the Madeira river. They had not passed from their own native province, Matto Grosso, and were, like most negroes, anxious to travel, and particularly desirous of going away. We had a number of volunteers among the soldiers, but the commandante said some of them wanted to desert, and he gave me those he supposed would be most apt to return.

There are no roads leading from the fortress except the rivers, so that every man understands something about the management of a boat. Three of the crew were negroes; one an Indian, whose mother was savage and father civilized Indian—what an Englishman would call "half and half." The fifth was of such a mixed composition that we were unable to trace his lineage. He was nearer a white man than a negro, not in very good health, and extremely ill-natured in his expression of face.

Pedro, the pilot, was an Amazonian Indian, quite lazy and not worth much, though his services were needed, as he was the only one in the party who had navigated the Madeira. The soldiers were supplied with a decent suit of uniform, ammunition, muskets, and farinha. We were obliged to reduce our baggage; even the jerked beef had to be diminished in quantity, as well as the men's provisions. The boat was too small when we were all on board to float lively. Four of the soldiers took their seats in the bow as paddlers. Mamoré mounted the baggage, with Pedro as pilot; while "Titto," the sergeant, a stout, well-built negro, stood up behind us and steered the boat. The commandante gave me a passport for the crew, with an account of the public property in their charge. Don Antonio entrusted me with a remittance to his father, which was the only sign we had from the people that we would ever gain the mouth of the Madeira. To him we are indebted for many prominent kindnesses. If he had not been here we certainly would either have gone to Rio Janeiro by the mail-route, or tried that from Cuayaba, down the Paraguay, to Buenos Ayres.

At midday, on the 14th of September, 1852, we parted with Don Antonio, who expected to be two years longer trading off the cargoes of his two small boats, which he left at Exaltacion during a voyage to Matto Grosso. He appears disappointed with his undertaking, and declares he never will make such a voyage again. He supports a party of twelve people. They remain by him in idleness during the time he is occupied disposing of his cargo, each man drawing regular pay, from four to six dollars a month. As our little boat passed swiftly down the current among the rocks, the men paddled as though they feared being recalled. They all sang as we bid farewell to the grim old fort. The commandante treated us with marked attention, and appeared sorry to let us go so soon. He said he had spent several years in his younger career as an officer at the fort. Officers generally shrunk from orders here, for the place had the name of being unhealthy. After the death of its last commander, he had been selected for the station because he was acclimated.

There is a horrible disease among the soldiers, called the "Fort fever," which, for the want of medicine, slowly destroys the garrison. We found the climate quite pleasant, but its general character is any thing but favorable from reports.

Thirty miles below the fort I sealed a bottle, and threw it into the Itenez river, with a note inside, requesting the finder to enclose it to Washington city. Titto was somewhat surprised at what he saw us doing, and inquired who the note in the bottle was directed to, and

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why it was thrown into the current. On being told that the bottle would go to North America in the water, if undisturbed, he told the other negroes, the gentleman had sent a letter home in that bottle. A tall, ugly looking negro in the bows, answered in Portuguese, "It don't go there." The negroes all engaged in an argument upon the subject. Titto said it would certainly go somewhere; that it could not go to Matto Grosso, because the current of the river flowed from there to the fort. A little sleek black, by the side of the other, shook himself, laughed out loud, and paddling with all his might, said, "Come, boys, let us get along down; that nigger in the stern of the boat is right."

On the evening of the 16th of September we landed silently on the sand flat, near the mouth of the Itenez, for the purpose of making an observation upon the stars for latitude. The men stood at ease with their arms, while Richards drove the musquitoes away with a bunch of green bushes, for the observer is constantly under the necessity of being fanned. We were on the Brazilian shore, while a great prairie-fire lit up the night for the savage "Houbarayos" on the Bolivia side of the river. We succeeded in getting a good observation, and after continuing down stream some distance, swung to a snag in mid-channel during the night.

Early in the morning of the 17th of September we came to the junction where the Itenez empties into the Mamoré. The beach was lined with water-fowl; alligators lay on the sand like canoes, half out of water; porpoises were playing about, while fish were jumping. Even the prairie and forest birds seem to come down to join the congregation. It was evident, by the conduct of the birds and the fishes, that they had all collected together in one place for some particular public purpose.

The water of the Itenez is 4° warmer than the water of the Mamoré. During the cool nights, the fishes and the birds sleep in or by the warmer water, which protects them. We saw a wild hog feeding near the bank; he, too, had been sleeping near the warm bed of the Itenez. There are exceptions to this practice, both among the fishes and birds; some of the fish ascend the muddy stream, while others seek the clear. Many fish we recognise in the Mamoré, like those found in the northern rivers of the United States; while those in the Itenez seem to take after families we had known living in streams flowing through the sandy soil of Florida. The porpoises of the sea are of a deep blue color; those of the turbid waters of the Mamoré are lighter. In the limpid waters of the Itenez, the porpoise has a light white and pink color, though all puff and jump above the surface of the water, and are of the same size,

shape, and manners. The drift wood, and more active current of the Mamoré, produce an enlivening effect. After repairing one of our paddles, which was broken by hard pulling, we launched our boat, and were carried gallantly on the Mamoré once more.

The distance by the river from the mouth of the Itenez to Fort Beira, is about fifty-five miles in an east-southeast direction; opposite the junction of these rivers, there are three small hills on the Brazil side. The Mamoré turns its course from a north direction a little to the westward. The stream here comes in contact with the solid formation of coarse granite in the Brazils. The commandante of the fort told me his father made a fortune by collecting diamonds on the head waters of the Paraguay in Brazil, and that he had found traces of the same stones in the bed of the Itenez. The sharp angular edges of the diamond, put in motion by rippling water, cuts itself a little hole in the hardest rocks. As the waters rush over it in the wet season, the diamond works deeper and deeper, so that common stones may enter the hole. The water whirls round in this hole, the common stones wear away the sides, and increase the size of the cavity, while the diamonds are busily at work at the bottom. In such holes the diamond hunter seeks his wealth. We find no traces of silver or gold on this side of the Madeira Plate. We passed through a rapid, between rocks on the banks, getting a cast of the lead and *no* bottom.

September 17.—At 9 a. m., thermometer, 78°; water, 79°; wind southeast. The banks are thirty feet high, and well wooded. The river is five hundred yards wide, with a depth of from thirty to sixty feet. The country on both sides of us appears well adapted for cultivation, many parts of it being above the rising of the floods. Pedro tells me we have the "Sinabos" savages on the Brazil side of us, and the equally uncivilized tribe of "Jibo" on the Bolivia side. Our men work well; with a one-mile current, we keep on day and night. Large green and black flies annoy us very much, in addition to which we have sand-flies and musquitoes at night. At 3 p. m., thermometer, 87°; water, 80°; wind southeast. As the moon went down, heavy clouds rose up in the east, and lightning flashed there. The men slept while we drifted along among snags. Here and there a sawyer bobbed up his head. The only way to keep clear of them is by listening to the music of the waters playing against the logs as we pass in the darkness of the night. One man keeps watch with his paddle in the bow. He watches and talks to us at the same time. He tells me the Emperor of Brazil pays him sixteen mil reis a month, and finds him in board and lodging. Mil reis vary in value; at present worth fifty-five cents.

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He is not a slave, but was born a free negro, which is the case with most of those who enter the army. Every man born free has either to serve the Emperor or pay tax money. As he had no money, he was obliged to enlist. He did not know how long he was enlisted for, or when he would be permitted to go home to Cuyaba, where his mother lived. He had asked a number of times to be paid off and discharged; but he was answered the Emperor required his services, so he is uncertain when he will be able to get off; though, when he returns from this trip faithfully, and reports himself to the commandante, he may be permitted to go to Matto Grosso with the mail, and then he thinks of detaching himself by not returning. Slaves are not employed as soldiers, he tells me; only the free blacks. From his tone, he considers the man who cultivates the sugar-cane and cotton-plant is degraded, compared with his own occupation. According to his account, there are a great number of free-born black people in the province of Matto Grosso. He considers the town of Matto Grosso a miserable place compared with Cuyaba. The people in the former place are all very poor—mostly colored folks—and the country round about is very little cultivated; but in the latter town there are rich white people, he says, who own slaves and cultivate corn and beans. He always has plenty of tobacco to smoke in Cuyaba, but at Fort Beira the men have very little; they are often without it, as well as pine-apples and plantains. The negroes at Cuyaba have balls and parties, music and dancing, every night. They don't drink chicha, nor do they understand how to make it; but they drink great quantities of aguadiente, which the Emperor don't give them as a part of their rations. They never get any at the fort except by the mail-boat. When letters come from the Emperor, then the soldiers get a jug or two of aguadiente by the mail-carriers, and it is used up at once.

September 18.—The negroes gathered a quantity of cream or Brazil nuts from under a large tree on the Bolivia side. The nuts are encased in a hard shell, which the men broke with our hatchet. The tree was one of the largest in the forest, and the only one of the kind we saw. Pedro pointed it out to them, otherwise we probably should have passed it without knowing such good things were near us. The nuts, with a turkey and goose, shot on the beach, served us for breakfast. The negroes are poor fishermen compared with the Indians. There appear fewer fishes below the juncture of the Itenez with the Mamoré; the water is still muddy. At 9 a. m., thermometer, 80°; and water of the same temperature, which is rather warm drinking; clear and calm. At 3 p. m., thermometer, 88°; water, 83°. The river is half a mile wide

in some places, and the channel clear of drift-wood, with from twenty-four to forty-eight feet depth.

September 19.—A turn in the river brought us in sight of high land to the north. The negroes blew two cow's horns, and shouted at the sight of it. Laying down their horns, they paddled with a will to their own musical songs, by which they kept time. We met a north wind, which created a short wave as it met the current of the stream, increasing in speed. The land has become low on both sides, and is swampy, with signs of being all flooded in the rainy season.

At 9 a. m., thermometer, 82°; water, 81°. At 3 p. m., thermometer, 87°; water, 80°. We passed an island, rocky and wooded. Flowers bloom and decorate the richly green foliage on the banks. The current is quite rapid, and we dash along at a rate we have not been able to do before on the Mamoré, passing the mouth of a small river—Pacanoba—which flows from the Brazils and through several islands. We came alongside of one of them for the night. Within the death-like, mournful sound of the "Guajará-merim" falls our raw-hides were spread, hair side up, as table and chairs. While the men made a fire, I was listening to the roaring waters, and thinking what sensible fellows those Cuyavabos Indians were to run from it. The night was starlight; but the mist arising from the foaming waters below us was driven over the island by the north wind, which prevented my getting the latitude. Small hills stood a very short way back from the islands, in Brazil. The land appears to be above the floods on both sides. As we are free from musquitoes at night, and the savages do not inhabit our little island, we sleep soundly.

September 20.—By daylight we were up and off, pulling across to the Bolivian shore to the head of the falls. We were in doubts how our boat would behave in the rapids. After taking out part of the baggage, which was passed over a rocky shore below, the boat was pulled through without any difficulty. The channel was about fifty yards wide, with very little fall; the whole bed of the river was divided by wooded islands and black rocks, with large and small channels of water rushing through at a terrible rate. A steamboat could, however, pass up and down over this fall without much trouble. We embarked, and found our little boat, which had been named "Nannie," gliding beautifully over the short waves formed by the rapid motion of the water. The rocks are worn away in long strips, and cut up into confused bits by the action of the river constantly washing over them. On the islands, quantities of drift-wood and prairie-grasses are heaped on the upper side.

One of these islands occupied the middle of the bed for three-quarters

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of a mile in length. We followed the channel down on the Bolivia side to its lower end at a rapid rate; when we came to the foot of the first fall we looked back *up-hill*, to see the number of streams rushing down, each one contributing its mite to the roaring noise that was constantly kept up. We saw no fish, but last night met large flocks of cormorants, flying in a line stretching across the river, close to the surface of the water; this morning they came down again. These birds spend the night over the warm bed of the Itenez, and return here in the day to feed.

No sooner had we cleared these falls than we found ourselves at the head of another rapid, more steep, called "Guajará-assu." Pedro took us to the upper end of a path in the woods, on the Brazil shore, where Don Antonio had transported his cargo overland, three hundred and fifty paces, to the foot of the falls. His large boats were hauled through the water by means of strong ropes rove through large blocks.

Our cargo was landed, and while Richards, with one man, was engaged carrying the baggage down, I took the boat over on the Bolivian side, and we hauled her three hundred yards over the rocks and through the small channels, down an inclined shelf of about twelve feet fall. The main channel is in the middle of the river, with waves rolled up five feet high by the swiftness of the current, through which a steamboat could pass neither up nor down.

The river cuts its way through an immense mass of rock, stretching across the country east and west like a great bar of iron. The navigation of the river Mamoré is completely obstructed here; the river's gate is closed, and we see no way to transport the productions of Bolivia towards the Amazon, except by a road through the Brazilian territory. On the east side of the river, hills are in sight, and among them a road may be found where a cargo might pass free from inundations.

The navigable distance by the rivers Chaparé and Mamoré, from near the base of the Andes, at Vinchuta, to Guajará-merim falls, is about five hundred miles. We anxiously pulled across towards the baggage, as the division of a party in this wild region is attended with great risk. This day's work gave us some little experience in the new mode of navigation. The sun is powerfully hot, but the negroes strip themselves, and ease the little boat gently down in the torrent between rough rocks. Don Antonio's advice was of the greatest importance to us in the choice of a boat and men. The long canoes of Bolivia would have been broken to pieces in this first day's travel among the rapids. There are no paths through the wilderness by which we could travel in case of an accident, and rafts we had seen enough of at the head of the Madre-de-

Dios. Embarking our baggage, we continued under a heavy thunder storm, which came up from the northeast, and whirled over our heads, sending down heavy drops of rain. The banks of the river are twenty feet high. The country on the Bolivian side is level, and there the lands are overflowed half the year; but the Brazilian side is hilly; the ridges appear to run at right angles with the river, which passes over the toes of the foot of them. The whole country is thickly wooded with moderate-sized forest trees. The river below these falls is occasionally three-quarters of a mile wide, with a depth of from twelve to thirty-six feet. The current is rapid as we leave the foot of the falls, gradually decreasing in speed until the boat enters the backed water, which is dammed up by the next ridge of rocks which thwart the free passage of the river.

September 21.—At 3 p. m., thermometer, 83°; water, 81°. The south wind blew all last night, accompanied with rain. Early this morning we arrived at the head of "Bananeira" falls, distance eight miles from the upper shelf. I find Pedro useful in pointing out the ends of the paths over the land cut by Don Antonio. His services as pilot, however, are not to be depended upon. Titto seems to be perfectly at home in the management of a boat among rocks, and assists me the most of the two. The cargo was landed on an island near the Bolivian shore. The path led through bushes and trees, down hill, near four hundred yards. The work of transporting the boxes, amidst the annoyance of swarms of sand-flies, was harassing, and with difficulty Richards could make the ill-natured member of the crew carry as many boxes as he did himself. The river flowed windingly; the baggage could be sent straight across; but the boat had to be dragged, towed, lifted, and pushed through the rough rocks and rushing waters for over a mile. This was trying work. The heat of the sun was very great; the negroes slipped, and it was with great difficulty at times they could hold the boat from being carried from them by the strength of the waters as they heavily passed through the choaked passages. The men stand easing down the boat up to their necks in water. The rocks are only a few feet above the water level; they are smoothed by the wearing of the water and drift wood. It is not easy for the men to keep their feet under water. These negroes are good men for such service; they crawl among the rocks like black snakes. Bananeira falls take their name from quantities of wild banana trees formerly discovered here, but we saw no traces of them. The fall is about twenty feet. The islands are generally very low, a few feet above the present surface of the river. All the rocks, and a great part of the islands, are overflowed in the rainy

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season. Large heaps of drift wood lodge against the trees. On the highest rocks we found pot-holes, worn down to the depth of eight and ten feet by the action of small pebbles, put in motion by the current as it passes over and whirls down, boring into the solid mass of coarse granite. These pot-holes are generally half full of stones, the large stones on top; gradually descending towards the bottom, they were smaller, until at the very last they were composed of bright little, transparent, angular-shaped stones, less in size than a pin's head; among these the diamond hunter looks sharp. Some of these pot-holes are three feet wide at the mouth, decreasing in edge uniformly towards the bottom. When we gained the foot of these falls, over which it is utterly impossible for a steamboat to pass at any season of the year, we had to ascend a channel on the Bolivia shore for the baggage. Mamoré lay by a part of it as watch, while the rest of the party were at the other side of the island. We were nearly exhausted; the men had nothing to eat half a day, and the dog looked thin and sick. There were no fish, birds, monkeys, or Indians to be seen, nor were the men successful in finding castanhas, Brazil nuts, which they very much needed, as they had nothing to eat but their allowance of farinha. The negroes were very tired, but I observed the life improved them; they looked stronger, and were getting fat. This was a great relief, for we were the worse for wear. I was kept in constant excitement, lest some accident should happen to our boat, or that an attack would be made upon our baggage party by the savages. At 3 p. m., thermometer, 85°; water, 81°, and less muddy; dashing over the rocks appears to filter it.

The boat was carried along at a rapid rate by the current, which boiled up and formed great globular-shaped swells, over which the little boat gayly danced on her homeward way. The satisfaction we felt, after having safely passed these terrible cataracts, cheers us on. We were nearly the whole day getting *two* miles. We were prevented from the danger in our path to proceed at night. The boat was fastened to the Brazil bank, and after supping on a wild goose Titto was fortunate enough to shoot, we slept soundly until midnight, when we were suddenly aroused by the report of a gun. The men were lying by a fire on the bank, near a thick tall growth of grass which skirted the large forest trees. Richards was close by me. I heard Titto's voice immediately following the report, saying "the devil"—we were all up in arms; Titto said he had shot at a tiger, which was approaching the men as they slept; Mamoré had been faithfully prowling in the woods, keeping close watch over us while we all slept; because he gave the men some trouble in the boat, they laid this plan to put our trusty friend to death. Richards found

the dog shot in the heart, close by the heads of the men, four of whom were in the secret, while Pedro and the Indian were sleeping. We placed great confidence in the watchfulness of Mamoré; from him we expected a quick report of savages or wild animals. With him on watch we slept without fear, as the Indians are more afraid of the bark of a large dog than of the Brazilian soldiers.

From what we had seen of the men, we were convinced they were a rough, savage set, who would put us to death quite as unceremoniously as the dog. They expressed an impudent dissatisfaction when I ordered Titto to put a man on watch, and keep sentinel all night. We lay till daylight, with our pistols prepared for an attack from any quarter. The negro murderers on the highways of Peru are more desperate and unmerciful than either the Spaniard or Mestizo; so it is with a half-civilized African negro. At daylight I was particular to let every man of them see my revolver. We kept a close watch upon them, both by night and by day. They had for some reason or other unknown to us taken a dislike to Richards, who never gave them an order except when he was left on shore to attend the portage of the baggage. They were under an impression we were ignorant of what they said when speaking their own language, as Titto and Pedro spoke to me in Spanish. On one occasion, after the loss of Mamoré, I overheard the ill-natured one, after Richards spoke to him about tossing water into the boat with his paddle, say to the rest of the crew, "I don't know whether I won't put a ball through that fellow yet, by *accident!*" After which I had no confidence in any of them, and told Richards our only safety remained in constant watchfulness, and the good condition of our fire-arms.

September 22.—The river below Bananeira falls is seventy-eight feet deep and half a mile wide, passing through rocks and islands, where we found the wild Muscovy duck. With a rapid current, we soon reached the mouth of the Yata river, a small stream flowing from the territory of Bolivia, not navigable for a vessel larger than a ship's boat. At "Pau Grande" rapids, the country is hilly on both sides, and wooded with large trees, from which fact the rapids derive their name. These rapids are about five miles from those above, with a fall of fifteen feet in one hundred yards. The boat was carefully passed through narrow channels among rocks fourteen feet high. Don Antonio came up over these falls, when the river was flooded, by keeping close along shore. He fastened the upper block of his tackle to large trees, or heavy rocks, and by hard pulling, inch by inch, dragged his boats along. No steamer could pass up or down "Pau Grande." At 9 a. m., light north-

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erly breezes; thermometer, 81°; water, 81°. Two miles below brought us to Lajens rapids. The boat was kept in mid-channel, and paddled with all the might of the men; we passed through the rocks at such a swift rate, hats had to be held on. This was a glorious passage; the little boat seemed to fly through a channel that might be passed by a steamboat.

CHAPTER XII.

Jacares savages—Mouth of Beni river—Obstructions to steamboat navigation—Madeira river falls—Lighten the boat—Pot holes—Granite—Pedreneira falls—Caripuna savages—Pedro milks a savage woman—Bilious fever—Arrive at the foot of San Antonio falls—The impracticability of navigating by steamboats the falls of the Mamoré and Madeira rivers—Proposed road through the territory of Brazil to Bolivia—Physical strength of the white, black, and red men, compared under a tropical climate—Tamandera island—Turtle eggs—Oil hunters—Borba—Mouth of the Madeira river.

A bark canoe lay by the Bolivia shore. Our negroes blew their horns, which brought four savages and a black dog to the bank. Two of them wore bark frocks, and two were naked—real *red* men. As we floated along by the current, the following conversation took place between the savages and the negroes: Savage—"Oh!" Negro in the bows—"Oh!" Savage—"Venha ca"—come here—very clearly pronounced. We told them to come to us, and they ran away, while we paddled slowly on. These Indians are of the "Jacares" tribe; they were soon paddling after us fast. We waited but a short time. Their swift canoe was constructed of one piece of bark, twenty feet long, and four feet beam. The bark was simply rolled up at each end, and tied with a vine from the woods; between the sides, several stretchers, four feet long, were fastened to the edge of the bark by small creepers, and a grating, made of round sticks fastened together with creepers, served as a flooring, which kept the bottom of the canoe in shape, when the Indian stepped into her. Two young men dressed in bark dresses sat in the stern, or one end, with well made paddles. On the other end sat two naked women, each with a paddle lying across her lap. As they came alongside, amidships sat an old chief with a basket of yuca, a bunch of plantains, a large lump of *pitch*, and several small pieces of a superior quality, called by the Brazilians "breu." The Indians use it for securing arrowheads, we find it serviceable in sealing our bottles of fish, or fixing the screw to our ramrod; besides which, the old man brought one small richly green parrot for sale. We bought him out with knives and fishhooks. One of the women was good looking, the figure of the other was somewhat out of the usual shape. On being presented with a shaving glass, they expressed great pleasure, and one after the other looked as far

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down their throats as they could possibly see by stretching their mouths wide open. Their greatest curiosity seemed to be to explore the channel down which so much of the results of their labor had passed. When they saw their dirty, half-worn teeth, the holes in their ears, noses, and under-lips, one of them poked her finger into her mouth through the lower hole, and brutally laughed. They wore long hair behind, and clipt it off square over the forehead, which gave them a wild appearance. The women were very small; their figures, feet, and hands resembled those of young girls. Their faces proved them to be rather old women. They appear cheerful, laughing and making their remarks to each other about us, while the men wore a surly, wicked expression of face. One of the young men became very much out of temper with Pedro, because he would not give *all* the fish-hooks he had for some arrows. The old man seemed very much excited when he came alongside, as though he half expected a fight. He was a middle-sized person, and chief of all the Indians in his tribe who inhabit the Bolivian territory. He represents his tribe as few in numbers and scattered over the country. Like the women, the men have great holes in their noses and under-lips, but nothing stuck in them. We supposed they were in *undress* on the present occasion. The chief inquired the names of the different persons, and wanted to know which was the "captain" of the party. The women begged for beads, and assumed the most winning smiles when they saw anything they wanted. We invited the chief to accompany us to the next falls and assist us over. He shook his head, pointed to his stomach, and made signs with distressed expression of face that he would be sick. He was then told we had more fish-hooks and knives; if he brought yuca and plantains we would trade at the falls. To this he consented, but said his people and the Indians below were not friendly, and that the enemy generally whipped his people.

Three miles below Lajens we came to the mouth of the *Beni* river. This stream resembles the Mamoré in color and width; but while the latter has a depth of one hundred and two feet, the former has only fifty-four feet water. Temperature of Mamoré water, 81°; of Beni, 82°. Near the mouth of the Beni there are islands. The whole width of the river is about six hundred yards. The junction of these two streams forms the head of the great Madeira, which is one mile wide.

In the month of October, 1846, Señor José Augustin Palacios, then governor of the province of Mojos, explored the falls in the Mamoré and Madeira by order of the government of Bolivia. We find the map of Señor Palacios a remarkably correct one. He ascended the Beni for a short distance, finding a depth of seventy feet water to the foot of the

falls beyond which he did not go, but returned and continued his course down the Madeira to the foot of its falls, when he retraced his steps to Mojos by the way he came. We have accounts of many falls on the Beni river from the province of Yungas down to the town of Reyes, between which falls the river is navigated by the Indians in wooden balsas. The Beni has never been explored throughout its length, but with the falls above Reyes and those seen by Señor Palacios near its mouth, which appear to have prevented him from ascending this stream on his return, we have reason for saying the Beni is not navigable for steamboats. The outlet for the productions of the rich province of Yungas is to be sought through the country from the gold washings of Tipuani to the most convenient point on the Mamoré between Trinidad and Exaltacion. The distance from the latter place to Reyes, on the Beni, is not very great. From the general conformation of the bottom of the Madeira Plate, we are of the impression that the road would have to be cut high up towards the base of the Andes, so as to clear the annual floods. The Mamoré, therefore, is the only outlet for the eastern part of the department of La Paz, as well as a great part of the department of Santa Cruz. The ridge of hills and mountains at the base of which the Beni flows, stretching from the falls of the Madeira to the sources of the river Madre-de-Dios, or Purus, separates the Madeira Plate from the Amazon basin, and divides the department of the Beni from the Gran Paititi district in Brazil, which extends north to the Amazon river. Paititi, it may be remembered, was the name given by Padre Revello to our favorite dog, lost on the road from Cuzco to Lake Titicaca.

We are about to pass out of the Madeira Plate, having arrived at the the northeast corner of the territory of Bolivia. The lands about the mouths of the Beni and Mamoré are now inhabited by wild Indians; some parts of them are free from inundation. Cacao grows wild in the forests. The head of the Madeira contains a number of islands. Here we find the outlet of streams flowing from the Andes and from the Brazils collected together in one large river. Water from hot springs and cold springs, silvered and golden streams joining with the clear diamond brooks, mingled at the temperature of 82° Fahrenheit.

The Madeira river flows through the empire of Brazil, and keeps the northerly course pointed out for it by the Mamoré. The first falls we met were close to the junction of the Mamoré and Beni, called "Madeira," three-quarters of a mile long. It is difficult to judge the difference of level between the upper and lower surfaces of the river. As the falls are shelving, and extend a great distance in length, the distance we run.

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during the day is not easily estimated. At one time we go at the rate of fifteen miles an hour, and then not more than one mile in half a day. This fall is not less than fifteen feet. Large square blocks of stone stand one upon another in unusual confusion. The boat was paddled through for a quarter of a mile, and by passing half the baggage out over the rocks, she was sledded and floated through narrow channels close along the eastern bank. The whole bed of the river, as we stand at the foot of the fall and look up, is a mixture of rough rocks laying in all positions on the solid foundation of granite, surrounded by foaming streams of muddy water. While we loaded our boat again at the foot of the falls, Titto discovered some Indians approaching us from the woods. They came upon us suddenly, frombe hind a mass of rocks, with bows and arrows in their hands. Don Antonio had warned me before I left him to be on my guard when the savages came up in this way. He said when they send women and children to the boat in advance, then there is little chance of a difficulty with the men; but when the women and children are kept in the rear, and the men come with bows and arrows in hand, the signs are warlike. We were, therefore, prepared. We, however, recognised our friends, the Jacares. An old chief brought a woman along loaded with roast pig and yuca. She carried a deep, square willow basket on her back, suspended by a strap of bark cloth round her breast. The chief and his two men were dressed in bark cloth frocks and straw-hats, while the only thing on the woman's back was her basket. One hand bore an earthen pot, which she also offered for sale. Titto traded with the party, and they gradually became much more easy in their manners towards us. For the want of an interpreter, I could not make out what customs were observed among them. These Indians bear the name among Brazilians of great thieves. They, however, appeared to be perfectly satisfied when we left them with the reasonable exchange. The passion expressed by one at Pedro for not giving him all his fish-hooks for a few arrows rather leads us to believe that, if they had outnumbered us, they would have been troublesome. We gave them no opportunity to treat us unkindly, for we were exceedingly polite, and so well armed with all, that they very justly acted their part in a spirit of reciprocity. There is great difficulty in knowing how to meet the savage. Treat him as a civilized man, and his better feelings are touched. It won't do to approach him indirectly, letting him see that, while willing to trade, there is a prudent readiness for a fight. They took a polite leave of us by shaking hands all round. We introduced the custom, which they seemed to like, though the stiffness of their elbow joints proved they did not understand the

matter. They sauntered up the rocky bank on the sand to where they had left their bark canoe at the head of the falls, and we went dashing on through the rocks in the rushing current.

September 23.—The river was seven hundred yards wide, and one hundred and five feet deep. We passed "Miserecordia" rapids, or swift current, but not a ripple was to be seen. The channel was clear of rocks, and we soon came to the "Ribeirao" falls, which are two miles long. The baggage was carried five hundred yards over a path on the east bank. Don Antonio transported his vessels on wooden rollers here. I think he said he was nearly one month getting up these two miles. The men were anxious to see whether they could not pass this fall with the boat in the water. They launched her down one shoot of twenty feet nearly perpendicular by the rope painters in the bow and stern.

Our boat was beginning to give way to the rough service, and as she leaked, it became necessary to lighten her load; then, too, the men began to fag. After they succeeded in getting the boat safely over a dangerous place, the boxes had to be carried one by one. The heaviest box was that in which were planted three specimens of Mojos sugar-cane. I had just cut my first crop, and found the plants were doing well, when it became necessary to relieve our little boat, and we were unwillingly obliged to leave behind what might have proved of importance to a Mississippi sugar-planter. Our baggage was taken out and restowed a number of times. Once the boat was on top of a rock, at another half under foam. The sun was scorching hot, and we had the full benefit of it. When the water is thrown on the bare rocks, it hisses as if poured upon hot iron.

The sides of the pot-holes are ridged like the inside of a female screw; some of them are nine feet deep. The water in them is quite hot; one of the negroes seemed to be fond of lowering himself into the pots of hot water; his face had rather a distressed expression, and while standing with his head above the edge of the pot, he looks as though undergoing a hot-water cure. The river appears to have worn away the rocks less than above. It flows over a solid mass, in which there are many gutters cut, from four to six feet deep, of the same width. Our canoe safely passed through one of these by the ropes, as the crew walked along the level rock. There were numbers of these gutters cut parallel to each other. The rock was worn as smooth as glass. After descending some distance in the middle, we found the channels so large and dangerous, that we must gain the east side of the river; the only escape for us, besides retracing our steps, was to cross a wide channel with a furious cataract above, and another close below. We hugged the foot

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of the upper as close as possible, and the men pulled with such force that one of the paddles broke when we reached half the way. With the remaining three, we made a hairbreadth escape; the boat could not have lived an instant had we been carried over the lower fall. The rollers formed by the swiftness of the current are five feet high; large logs are carried down so fast they plough straight through the waves, and are out of sight in an instant. The men came near upsetting the boat in a dangerous pass. They seem to be giving out through pure exhaustion. They have very little to eat; farinha adds not much to their strength, and jerked beef spoils. No fish are to be found, nor birds; a monkey would be a treat. Night overtook us half way down the falls, and we came to, on a barren rock, where there were two small sticks of wood, of which we made a fire, boiled water, and gave the men coffee. I observed a southern star, and turning for another in the north, was glad to find it had passed the meridian, as sleep was much more necessary than latitude. On the west side of the falls stood three small hills; on the east side a large white-trunked forest tree. This was the largest tree we had yet seen, though not quite equal to a North American huge oak.

September 24, 1852.—At daylight we *crawled* on; it would be a mistake to grace it with the name of travelling. The country is thickly wooded with Brazil nuts and cacao trees interspersed. Four miles further down we came to "Periquitos" rapids, which takes its name from numbers of parrots inhabiting the woods. These parrots are green, scarlet, and yellow, with long tails; they fly slowly overhead in pairs, crying an alarm as we are seen approaching. We paddled through these few rocks without the least difficulty. Banks of the river thirty feet high; soundings fifty-four feet. At midday a thunder gust with rain came from the *north*. As we are passing out of the Madeira Plate, we find the climate changing; northerly winds bring rain here, while southerly winds bring them farther south. At 3 p. m., thermometer, 86°; water, 83°.

"Araras" rapids were passed with much toil, easing the boat down by ropes made of bark, which are best for such work as this; the water has little effect upon them. The fall is small, and the channel clear. While the men gathered Brazil nuts from the woods, we bottled a young turtle, taken from among eggs found in the sand. Amphibia are poorly represented; we see no alligators, snakes, or frogs. The water has become much more clear; it has a milky appearance. The banks slope down regularly; being covered with a light-green coat of grass, they have the appearance of cultivation.

September 25.—At 9 a. m., thermometer, 84°; water, 82°; light north wind. At 2 p. m., thunder to the northeast. On the east bank were

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By Lieut! L. Gibbon USN

DESCENDING RIBEIRAO FALLS, MADEIRA RIVER, Brazil.

Lith of P.S. Duval & Phila.

cliffs of red clay fifty feet high, breaking down perpendicularly. We passed the mouth of Abuna river, which is fifty yards wide, and flows in from the southwest. At 3 30 p. m., thermometer, 86°; water, 82°. In the evening lightning to the southwest. We came to a number of rocky islands in the river, and took up our quarters on one of them for the night. We slept under blankets; there is a heavy dew, and the nights are quite cool. Richards was aroused by a severe pain in his ear; he was suffering all night long. The men told me it was common among the soldiers at the fort, caused by exposing the ear to night-air and dew. The only remedy reported was "woman's milk," which was not at hand.

September 26.—For the eighteen miles between the "Arares" rapids and "Pedreneira" falls, we found a current of only one and a half mile per hour, with a depth of sixty feet water. We have observed between all the falls passed, that the current becomes slow, and as there is very little damming up of the water by the falls, that the general inclination could not be great. We also found the land gradually getting higher, as though the river was flowing through a country which sloped against the current. We find at the "Pedreneira" falls the strata perpendicular; the river does not flow over a flat mass of rock as before, but cuts its way through a vertically grained rock; so fair and square has the river worn its passage, that the gap resembles a breach in a stone dam. The river turns from its northern course at a right angle, and flows east, inclining a little south, as though it wanted to turn back and flow into the Madeira Plate again. We suppose this fall to be situated on the top of that ridge of hills and mountains extending across South America from the Andes to Brazil. We are now on the chain which fastens Brazil to the base of the great mountains, and the river is sawing across and cutting it gradually asunder. Part of our baggage was carried over, and our boat towed along the east bank with less difficulty than we expected; we found a rapid current below.

On the south bank of the river we saw two bark canoes; the negroes gave us music on their cow's horns, and two red women appeared on the bank at a path in the thicket; they belonged to the "Caripuna" tribe. We pointed down the river, and called for "*Capitan Tupé;*" they ran away, and we continued to the Paredao falls. A whale boat might pass through the main channel with ease, but our boat was too small to attempt it. The baggage was landed on a sand-beach near the rocks, which were elevated forty feet above the water level. In the rainy season the floods cover them all except ten feet. I climbed up to the top for a view of the country, and to seek a passage for the boat. The men had a short distance to paddle, and then tow her through a nar-

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row channel by the ropes. The landing-place was in the rapid current; they missed it, and the boat ran away with them through the rocks—they were carried at a frightful rate; Titto shouting to the negroes at the top of his voice to pull for their lives, so that he might steer them safely, which he fortunately did. They were all so much frightened that it brought them to their working powers. The sight was an interesting one for me, as the smallest rock in their way would have dashed the boat to pieces. As I turned to go down I found myself surrounded by a party of savage women and children, who had come up behind me. There were eight women, ten children, and two unarmed men, all, from external appearances, savages of the purest water. On taking out my handkerchief, the women and children all laughed! One of the men stepped before me, and putting his hand into my pocket, took all the fish-hooks out, and appropriated them to his own use, by handing them to a homely woman who bore a sucking baby, and then coolly inquired whether I had a knife to give him. He was a short, thick-framed man, quite fat and hearty; the women were all ugly; the boys were the most cheerful, manly-looking Indians we ever met with. At my suggestion, they walked to the boat with me. Their chief "Capitan Tupé," as they call him, was absent on a hunting excursion. Their huts were some distance from the falls, so that we missed seeing their houses. They were quite friendly with us. Some of the men who came afterwards, left their bows and arrows behind the rocks, and walked up unarmed. The women carried their babies under the arm, seated in bark cloth straps, slung over the opposite shoulder. The infants appeared terribly frightened at the sight of a white man; one of them screamed out when Pedro milked the mother into a tin pot, for the benefit of Richards' ear, which still troubled him. The woman evidently understood what was wanted with it, and stood still for Pedro to milk her as much as he chose. The boys are remarkable for large bellies, as the sketch of "Matuá" and his brother "Manú" will show. The older ones express a willingness to go away from their mothers; Manú was asked, by signs, if he would go with me; he shook his head, no; when he was made to understand that he could get a pair of trousers and something to eat, he then nodded his head, yes. Pedro tells me they swell themselves up by eating earth, which Indian children all do. One of the Caripunas got into the boat and examined the baggage; he soon found a knife, which he took, and came out with it in his hand, before everybody. It belonged to one of the negroes, who took it from the Indian. The savage appeared disappointed; he was then told if he would bring yuca or other provisions for the men, he should have a knife.

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By Lieut.[t] L. Gibbon U.S.N.

Lith. of P.S.Duval & Co. Philad.[a]

MATUÁ AND HIS BROTHER MANÚ, CARIPUNA BOYS AND THEIR BARK CANOE.

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They all declared they had nothing to eat in their houses. We made them a little present, and bought a bow with arrows from one of the boys. They were particularly desirous of getting fish-hooks and knives.

Matuá is in the full dress of the men, who wear beads of hard wood round their necks, with bands bound tight round the arms above the elbow and round the ankles. The foreskin is tied up to a band of cotton twine, which is wound tight round the hips and under part of the belly. All wear their hair long, and cut square off in front. In large holes in their ears, they carry pieces of bone, or a stick of wood. Through the whole in the nose a quill is pushed, the cavity being filled up with different colored feathers, gives them a moustached appearance. These people are nearly all of the same height and figure, but differ very much in the features of the face. Some have thick lips, flat noses, and round faces; others are just the reverse. The former very ugly, and a few of the latter tolerably good looking. The women are larger than those we saw near the mouth of the Beni. There are not many of them; they live about in small bands, and said they found few fish in the river. They promised to plant yuca and corn, so that the crew might have something to eat on their return to the fort. As we embarked, they said "*shuma*," which Pedro informed us meant "good man;" but probably referred to more presents.

The lands on the south side of the river are inhabited by the Caripunas. It is flat, and a beautiful spot for cultivation. Small mountains and hills are in sight on the north side, as we descend by a rapid current. The river seems to be creeping along on a ridge, seeking an outlet to the north. At 3 30 p. m., thermometer, 90°; water, 83°; light northerly airs; thunder to the north, and a rainbow to the northeast.

September 27.—At "Trez Irmaós" rapids we found no difficulty. A large island in the middle of the river chokes it, and the water rapidly flows through two channels. As we dashed by, the men blew their horns for "Capitan Macini," another Caripuna chief, who lives on the south side of the river, with a small band of his tribe. Pedro speaks of "Capitan" in complimentary terms. He is represented as being exceedingly obliging; we wanted his services as pilot, but missed him. After passing "Trez Irmaós" rapids, the river turns north. A rapid current carries us through a chain of hills on each side, tending east and west. The foliage is unusually green and thick; forest trees have been broken by the action of violent winds. We scarcely are fairly launched out of the Madeira Plate into the Amazon basin, before we meet, at midday, a storm of wind and rain from the northeast, accompanied with thunder. We find the sea-way in mid-channel much too

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high for our little boat, and bring to. While the storm passes, the wind carries a cloud of dry sand before it. At 3 p. m., thermometer, 85°; water, 84°. We are now being avalanched down an inclined plane. Arriving at the head of "Giráu" falls, we find the true falls of the Madeira. They are short, but the rush of waters through a confined space, between immense masses of rock, baffles large sized vessels, and prevents their passing either up or down the river. Don Antonio transported his boats over the land here.

Richards was suffering very much from his ear; his under eye-lid hung down, the corner of his mouth became drawn up on one side, while he seemed to lose control of the muscles of his face; the pain was beyond endurance. All the men began to feel the effects of the change of climate; the nights cold, and midday sun very hot. They complained of headaches and pains in their backs; the strongest of them were jaded. Before they went to sleep, I dosed the party with raw brandy all round, which cheered them up. They have been much more respectful lately, and work with a will.

September 28.—The men are all in better health this morning. They carried the baggage through the woods on the east side of the river, and with the greatest difficulty got the canoe through the rocks. The river has been turned to the eastward by hills on the north side. The fall cannot be estimated with any degree of certainty; the descent is more precipitous, and the roaring of the foaming waters much greater than any we before met. We were from daylight until 3 p. m., making the passage from the upper to the lower side, before we got breakfast, which we took under the shade of trees, where the thermometer stood at 99°; wind northeast.

Pedro shot a few fish with his arrows, and a negro caught one with a line. As the vegetable kingdom appears fresh and vigorous, under the strong breezes filled with moisture from the North Atlantic, so again do we find animal life in abundance. The trade-winds from the ocean cross the land from Cayenne, in French Guiana, and strike this side of the Amazon basin. The clouds roll up, and the waters are wrung out in drops of rain.

The Paititi district of country which we have on our west, and the Tapajos district on the east, are watered by the northeast trade-winds. They get their moisture from the north Atlantic, and here we find on the side of these hills the boisterous region again, and the trees are torn up by the roots. These acts of the northeast trade-winds are written upon this slope of the Amazon basin exactly as we met the southeast trade-winds as they struck the Andes on their way from Rio Janeiro.

The Caripuna Indians we have just left told us they came *down* the Madeira for fish. They find little game and no fish, even in these mighty waters, above the boisterous region. The two Yuracares Indians we met on the side of the Andes said they would catch us fish when we got further down the rapid Paracti. Fish are just as particular in their choice of waters and *climate* as those animals which inhabit the dry land.

The foam that is produced by the water dashing over the rocks floats aloft in the shape of mist; and in the calm, clear, starlight nights, the gentle northeast breezes cast a thin gauze-like veil around us and affects the glasses of our instruments. All observations of the stars seem to be forbidden. Early in the morning, as the sun's rays strike upon the river, they gradually absorb the mist, and first that portion which has been scattered by the night winds, and looking just then, up or down the river from an eminence, the traveller may see the position of each cataract, like the smoke of a line of steamers. The powerful sun soon evaporates this mist, which speedily disappears as it rises. One of the crew caught a small electrical eel, which opened its galvanic battery and shocked the whole party. A rapid current, and no bottom at twenty-five fathoms water.

September 29.—We get our baggage stowed and all on board ready for a long pull, but soon fetch up among the rocks again. "Caldeirão do Inferno" rapids are caused by three rocky and somewhat wooded islands in the river. We pulled part of the way through on the west side without discharging baggage; the boat was gently eased down by the ropes. At the foot of these falls, which could not be passed by a steamboat, we discovered a bark canoe, manned with savages, paddling with all their might away from us; they seemed to be very much alarmed, and were soon out of sight. As we came to a place rather too rapid for safety among rocks, the men got out and towed us along the north bank; while doing so, three savage men, three women, three children, and five most miserably thin skeleton dogs, came to see us. The men laid their bows and arrows behind the rocks, and approached us without fear, but the slim dogs were disposed to show fight. They were weak and slab-sided animals; quite unsuccessful in their endeavors to raise a bark at us, but coughed out a sickly sort of noise, as they hung around their masters' legs. One had his ears boxed by a tiger, which gave him a perpetual stiff neck. They all looked as though they had been vainly struggling with the beasts of the forest. An unsightly old woman brought us a fried fish fresh from the river. One of the men had bilious fever, but was attended by a pretty girl, who took her paddle

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in one of the canoes which kept company with us. The parrots swarm along the banks of the river, but there are few other birds. The current runs at the rate of six miles per hour. River three quarters of a mile wide, with sand-banks and islands in the stream. We landed on the north bank with the Caripuna savages; men, women, and children, all seated themselves in a friendly way round our cow-hide, which was spread on the ground for breakfast.

Richards was left in charge of the boat, while I, with one of the negroes armed with a musket, followed a path through the woods single file for a quarter of a mile from the river. As we came in sight of huts the men and boys gathered under an open house at the end of the path; the women all seized their babies and ran into two enclosed buildings in the rear. The savages did not take up their bows and arrows, which however lay at hand, but several of them held knives, and others picked theirs up. Thomas, the tall negro soldier, came to a stand just outside of the shed, while I walked under and took a seat in one of the grass hamacs slung between the posts on which the roof was supported. The boys all laughed, and gathered round me. One man came up and leaned against a post close by me with his arm elevated. He held a knife in his hand; my hand was concealed under my jacket, where Colt's revolver rested in a belt. The Indian wanted to test me, as is their custom. A fine large rooster passed by. Savage was asked to sell it by signs of hunger. He at once took down his hand, and called out to the houses, when the women came out with their babies. One of them, a good-looking squaw, came to him, and they had a consultation about the chicken. She nodded her head, and the boys gave chase to catch it for me.

There were thirty savages living in this wild, out-of-the-way place. One of the men was chipping off the outside of a hollow piece of log with his knife for a *drum*, two of which already hung up under the shed. They expressed no pleasure at seeing us. They looked as though they preferred we would go away. The roof of the wooden house under which the men were collected was beautifully thatched with a species of wild palm-leaf. The frame-work was made of poles stripped of their bark, fastened together by vines or creepers. The whole rested upon forked posts set in the ground, between which there were slung a number of grass hamacs. Bows and arrows were their only home-made arms. The knives were imported. After making friends with them, they all came up, shook hands, and took a good look at me. The floor of the guard or men's house was swept clean. It seemed to be kept in military order, clear of all household or kitchen furniture. One of the

men and several women went with me to examine the dwelling-houses of the women. The roof extended within two feet of the ground. The sides and gable ends were also thatched in, with a doorway at each corner, and one in the centre next the guard-house; five entrances in all. The inside presented a confused appearance. Piles of ashes were scattered about the ground floor as though each woman had her separate fireplace. The inside measured about forty feet by fifteen. Earthen pots and plates were lying about in confusion; dirty, greasy hamacs hung up; tamed parrots were helping themselves to plantains. An ugly monkey looked dissatisfied at being fastened by the hinder part of the body to a post. The unpleasant variety of odors drove us out. In the third house there were but two doors. Here the miserable dogs kept up a terrible noise. The women took me to the hamac of an old sick Indian, who they made signs was dying by laying their heads on the palms of their hands and shutting their eyes. He was covered with a bark cloth blanket, which was cast off by him so that I might see his thin legs and body. He was very much reduced. By the whiteness of his hair, I judged he was dying of old age, or suffocated inside this damp, filthy house, where he seemed to have been turned to the dogs. There was one house in which the women slept. The open house was the sleeping apartment of the men and boys. There was great order among the men; the grounds round about were swept. Where the women were seemed all confusion and want of cleanliness. Their faces were covered with dirt. As to their clothing, we could better describe what they did not wear.

We saw no signs of a *place* of worship, nor of what was worshipped, though the Brazilians say they have seen among them "wooden images," figures of head and shoulders in shape like a man. A Catholic priest once visited these people, but found no encouragement. They looked on indifferently, taking more interest in the music of a violin and the singing than in anything else. The lofty forest trees shade the little huts; a path leads farther inland, where they cultivate patches of yuca and corn, though they have little to eat from the land at present, and take to the river for food. The children of these Indians strike us as being remarkably intelligent, compared with those on the tops of the Andes. All Indian children seem to be in much brighter spirits than the older ones. They have yet to be taught the art of using chicha, which the women are said to give their husbands here in the woods. We gave the multitude an invitation to join us at breakfast. A little boy walked by me with the rooster under his arm, and they all followed single file, with the music of crying babies, to the bank of the river,

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where they seated themselves round. Some presents were made to them in exchange for the offer of several chickens and a large partridge. To the little girls we gave earrings, to supply the place of fish or beast-bones; to the boys fish-hooks; and to the men knives. The elderly women particularly fancied looking-glasses for themselves, and glass beads for their babies. One very unattractive woman requested me to make her an additional present of a looking-glass. A knife had been offered, which she particularly requested. She received the refusal with such a savage side-glance, that the damage was repaired at once, and the men ordered into the boat. Her sister used paint. Her forehead was besmeared with a red color, and her lips blackened. We presented her with a large looking-glass, which she used for examining as far down her throat as possible. Pedro had a slight difficulty with one of the savages, who he said had stolen his knife from the boat. I replaced it, and we went on without being disturbed, though, as we afterwards learnt, these fellows not long since robbed two Brazilians on the river, who escaped down stream in one of the bark canoes of the savages, leaving their own boat behind. At 3 p. m., thermometer, 91°; water, 85°; river one mile wide, interspersed with islands and rocks, twenty-five fathoms depth. On the east side a small stream of clear water flows in. The water of these small side-streams are often 6° Fahrenheit cooler than the main river water. We bottle it, as the river water is unpleasantly warm for drinking. A man fully comprehends the blessing of ice by gliding down this river. The current is fast one hour and slow the next few minutes. The men pull when they feel like it, and rest when they wish. We are moving along, more or less, all the time during the day. The river is not very winding.

September 30.—About twenty-five miles on a northeasterly course brought us to "Doz Morrinhos" rapids. The difference of level here is slight, though the passes are difficult. A part of the baggage was handed over the rocks, which proved a prudent plan, as the boat was nearly swamped. The country is quite uneven and thickly wooded. At midday we had a light shower of rain, accompanied by thunder, without wind. At 3 p. m., thermometer, 87°; water, 85°; with a strong southwest wind. At the foot of these falls we sounded with five hundred and ten feet, and no bottom.

At a late hour in the afternoon we arrived at the head of "Teotoni" falls, the most terrific of them all. Here I was attacked with a severe bilious fever, which brought me at once on my back. The pain in my left breast was somewhat like that described by those who have suffered with the "Chagres fever." We were all worn out, thin, and haggard.

I had been kept going by excitement, as the men were careless, brutal negroes, and Richards suffering still with the pain in his ear.

October 1.—This fall is over fifteen feet, ten of which is at an angle of 45 degrees. The roaring made at intervals by the rushing of the waters over and through the rocks, sounds like distant thunder. Our little canoe is driven for safety out of the water to the land. The baggage was carried by a path on the south side to the foot of the falls. Richards went along with the first load, and remained below looking out, while I rested to see every thing sent over. The men idled their time between us, until we were caught in a heavy rain and thunder storm from northeast. The boat was put upon rollers and transported four hundred yards over a hill, and launched into the river below. We were from daylight until dark at the work. I should not complain, however, because men never had a more harassing time than these have had. If alone, they would not have come half the distance in the same length of time. They have pushed on for me, when I least expected they would keep on.

We noticed that at nearly all the falls in the Madeira the river turns as it cuts its way through the rocks, forming nearly a semi-circle towards the eastward; after gaining the base of the declivity, the stream returns again to its original course. Here the path over the land describes a diameter. The storm continued all night in squalls. The negroes took off their clothes and laid down upon the bare rocks under a heavy rain, with cold wind, where they actually slept, while those of the crew, with Indian blood, built a fire and slept on the sand close by it in their clothes. The baggage was left on the sand bank until morning covered with raw hides. We were well drenched, certainly a poor remedy for bilious fever, particularly when followed by the heat of a tropical sun.

October 2.—Five miles below are "San Antonio" falls, which we passed by tow-lines without disembarking our baggage. The difference of level is very small; the bed of the river much choked with rocks. The stream is divided into a great number of rapid and narrow channels. We took breakfast on the west side, at the foot of these falls, with feelings of gratitude we had safely passed the perils of *seventeen* cataracts. Those parts of the rivers Madeira and Mamoré, between the foot of "San Antonio" and the head of "Guajará-merim" falls, are not navigable for any class of vessels whatever; nor can a road be travelled at all seasons of the year, on either bank, to follow the course of the river, for the land bordering on the stream is semi-annually flooded. By referring to the map it will be seen, we travelled from Guajará-merim, on the Mamoré, in a due north course, to the Pedreneira falls, on the Madeira. By the

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windings of the river, we estimate the distance not less than one hundred miles. From the Pedreneira falls to the foot of San Antonio, our direction was about east-northeast, a distance by the river of one hundred and forty miles, which makes the space not navigable two hundred and forty miles. A road cut straight through the territory of Brazil, from San Antonio falls, in a southwest direction, to the navigable point on the Mamoré, would not exceed one hundred and eighty miles. This road would pass among the hills, seen, from time to time, to the eastward, where the lands, in all probability, are not overflowed. On a common mule road, such as we find in Bolivia, a cargo could be transported in about seven days from one point to the other. Don Antonio Cordoza was *five* months struggling against these numerous rapids and rocks to make the same distance, with his cargo in small boats. We have been twelve days descending the falls, which is considered by Brazilian navigators fast travelling. The wild woods that cover the lands are unknown to the white man. Topographically considered, the lands on the east side of the Madeira are the most valuable.

Our experience with a black crew gives reason to believe the climate is more congenial to them than the white or red races. Among the half-civilized and savage aborigines, we notice very few men live to an old age; they generally pass away early; tribes are composed usually of men under forty years. The moment we landed at Principe, there appeared before us a number of active, gray-headed old negro women and men, grinning and bowing, with as much life in their expression of face and activity of manner as the youngest. Long after the savage has become hamac-ridden with age, the negro, born before him, is found actively employed. The physical strength of the negro is not equalled by the red man here. The Indian enjoys the *shade* of the forest trees, while our negroes rejoice in the heat of the sun.

The India rubber is found in these woods, with quantities of Brazil nuts and cacao trees. The whole forest is as constantly green as the snows on the peaks of the Andes are everlastingly white, although the leaves fall and the snow melts away. In the month of April, or thereabouts, the sap which flows through the veins of these forest trees, begins to fall, not suddenly, as the sap of the sugar-maple in our northern States, but gradually and slowly, as the live-oak, magnolia, or other evergreens of Florida. The sap descends from the topmost branches first; the leaves begin to sicken for want of nourishment; they wilt, and the first that falls to the ground is from the end of the branch which first lost its sustenance. The *tide* of sap ebbs a shorter time than is usual in a climate where half the year is wintry. The *flood* tide of sap goes up

in time to send out new leaves at the top of the tree before the last on the lower limbs have fallen. During this rise and fall of the sap in the trees tropical forests shed their leaves. The work is performed in such a secret way, that it would not be observed, did we not find the ground covered with dead leaves, while the trees are perfectly green. On the Andes the llama, grazing near the snow line, had its back thickly clothed with wool, while the ground was strewed with its last year's crop. When the sun stands vertically over the llama, it sheds its wool; when the sun passes far off on its northern tour, the leaves fall from the forests at the base of those great mountains. During the season of the year when the sap is in upward motion, the "rubber" man taps the trees and gathers the milk, converting it into shoes by smearing it over a last, and poking it into the smoke of a small fire near by him. The guava and banana fall to the ground to fatten the wild pecary; the oriole nestles in the tree-tops, and feeds its young in the stocking-like nest which hangs from the tip ends of the limbs. Toucans appear astonished at the songs of our negroes as we paddle down, leaving the cataracts behind us.

At 3 p. m., thermometer, 86°; water, 84°; we bottled drinking water from a small stream on the west side, having a temperature of 76°; width of the river six hundred yards; sounded with two hundred and ten feet of line without finding bottom; current two miles per hour. The channel is perfectly clear of all obstructions; few logs are enabled to pass safely through all the falls in the dry season, but when the river rises they come down at a terrible rate, and in great numbers, though the channel of the Madeira is seldom as much obstructed by drift-wood as the Mississippi.

In the evening we arrived at Tamandua island; one hundred Brazilians were engaged gathering turtle-eggs, of which they manufactured oil. These men came up from the Amazon; the sight of them gladdened our spirits; we had passed the savage race, and reached civilized man, on the Atlantic side of the wilderness; we were out of the woods, though the trees are larger here than on the southern side of the ridge of hills through which the Madeira flows. The forests here resemble those on the side and base of the Andes. The negroes supped on turtle-eggs, while they drew comparisons between the people of the Amazon and those of "*their* country," as they called Cuyaba, on the other great South American river. One of the oil merchants kindly invited us to take up our quarters in his hut, but the fever kept me in bed in the canoe, with pains that forbade sleep at night. He sent us two turtles, measuring nearly three feet long, with one foot and a half of thickness. One of them was a load for a man.

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The turtle deposits its eggs in the sand on these river islands at the beginning of the dry season, commencing in July and August. The heat of the sun hatches the young; they dig holes four feet deep, by throwing the sand on each side with the hind-flippers. The motion is quick and sudden, casting the sand a distance of six and eight feet from them. After reaching the depth required, the female drops eggs in the hole and covers up the top with sand drawn in by her fore-flippers. There is an equal distribution of labor; the hind legs dig the hole, and the fore ones fill it up. The hole is gradually filled with from one hundred and fifty to two hundred eggs. There is some difference of time between the first deposit and the last; yet, so nearly does the turtle calculate the depth of sand, and power of the sun, that all the eggs are said to hatch exactly at the same time. The young turtle rises four feet from the bottom of its birth place, to meet his little brother at the surface. They trot to the river's edge side by side, where they practice swimming, to be ready for the floods that come down from the distant Andes soon after they are born.

The oil man ascends the river, with a fleet of canoes in company, manned with workmen, loaded with provisions, copper boilers, spades, &c. They know the time the turtle has laid its last egg, and while the eggs are fresh, they dig them from the sand, beginning on one side of the island, and turning up the soil to the proper depth. They throw out the eggs like potatoes, while others gather them up in baskets. A canoe is washed out, and the eggs thrown in and thoroughly broken by means of forked sticks. The soft shell or skin, is pitched out; a quantity of water poured in and left to stand in the sun. The oil rises on the surface; this is skimmed off and heated in copper boilers. Being put up in large earthen jars or pots, containing four or five gallons, it is sold in the markets of the Amazon. In Pará, the price per pound varies from five to ten mil reis. One silver dollar of Bolivia money is now worth eighteen hundred reis. While the "manteca"—butter or oil—is fresh, it is used for culinary purposes. The cook, of course, knows nothing of the number of young turtles which may have been boiled in it during the late period of digging. Its general use, however, is for lamp oil. The annual supply from all the rivers in the Amazon basin is consumed within the mouths of these rivers.

Turtle are now said to be scarce. We see millions of eggs destroyed by the oil-hunters, who search all the islands, and drive the turtles from one to the other. The men tell me there are no eggs to be found on the island they worked at last year. The mother turtle was disappointed; the little ones never made their appearance from out of the

sand where eggs were deposited, although they are not wise enough to understand the boiling process their eggs had undergone, yet, something was known to be wrong, and placing no faith in *that* sand bank, every one deserted it, and made use of an island they would not have chosen had they been let alone. There the oil man continues to follow them. These turtle are called by the Brazilians "Tortaruga Grande." There are said to be four other kinds in the Madeira river, viz., "Cabecudá," "Trocajá," "Pitehú," and "Matá-matá." The Tortaruga Grande is the best for eating and for oil; they are also in greater abundance than the others.

Huts are built in the sand for the protection of the hunters against the great heats of the sun in the day, and the rains. The men, who are of Amazon Indian blood, have their wives with them. There are few negroes at this business. Brazilians, of Portuguese descent, gather a band of adventurers, or fishermen, who are willing to leave their homes for this wild country, and seek their fortunes among the sands, where no diamonds have yet been found. The life is a hard one; the exposure on the voyage, and after they arrive on the ground, is great. Many of them have fevers, their provisions get short, the water is warm, and unless the work is carried on at a rapid rate, the young turtles begin to form in the egg, which impairs the quality of the oil—to say nothing of the butter. Great quantities of rum are consumed on these expeditions. The Portuguese set up shop where rum is sold, and a debtor and credit account is opened with the Indian workmen; in the same way the creole miner does with those of the Andes, making profit, while he pays the workmen's monthly wages—from three to five dollars—with provisions.

The workmen soon get tired and want to return. The employer takes out a passport for them all at the last military post as he ascends; they are forbidden to travel about the country without one. The workman is held to his promise to remain during the season, good treatment or bad, by retaining his passport. Our crew became intoxicated among their countrymen, and danced part of the night with Amazonian girls, to the tune of violins, in the huts, while heavy rain poured down in large drops, accompanied with thunder and sharp lightning. Wind blowing fresh from northeast.

October 3.—The crew wished to remain among these greasy people, but as we preferred floating on by the current, to laying by the side of the oil canoes and hot sand bank, we pushed off with a *mail* on board. As we descend, the river stretches out in long bends towards the northeast. Twenty-five fathoms sounding and no bottom. The width varies

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from six hundred to a thousand yards. The country is level; the growth of trees decreasing in size the lower we go.

October 4.—At 9 a. m., thermometer, 88°; water, 87°. The small streams which flow in from the eastern side are of a deep green color, at 87° temperature. The banks are twelve feet high, and break down perpendicularly.

October 5.—This morning we met four "Muras" Indians fishing with bows and arrows mid-channel, in small canoes, hewn from one log. One canoe contained a woman and two children, under the thatched roof of a little cabin. These people were all dressed in decent fashion. The women wore a calico frock! The men were larger than the Caripunas, and more reserved; it was with difficulty we could get them to stop and sell us a paddle; we wanted to replace a broken one. A knife was paid for it, when they desired to push off from us. Probably they were ashamed of being fishermen without any fish; or had, at some time, met with ill treatment. Sounded with twenty-three fathoms, no bottom. A short distance further down, got bottom at thirty-six feet, and lost both lead and line. There are a few snags in the channel, among which our line was entangled.

My bilious has now turned to ague and fever. The stench from the muddy banks, and stagnant pools of water, has become exceedingly offensive, and at night we have musquitoes, which we were not troubled with among the falls. The current varies in its speed from an half to two miles per hour, showing an uneven surface. The ground over which it flows is sloping in steps, or shelving, which gives the outward motion of the water a jerking impetus. Islands, long and narrow, divide the stream into two channels; yet the depth of water, and width of the passages, are sufficient for all commercial purposes. Pedro tells me the "Toras" tribe of Indians inhabit the east side of the river; we, however, saw nothing of them.

October 6.—We landed on the west bank, at "Roscenia de Crato," which is a frontier post of the Brazilians, on the Madeira. The entire country between this settlement and the town of Exaltacion, in Bolivia, is inhabited by savages. The Portuguese have ascended the Amazon and Madeira thus far on their southwestward emigration. The Spaniards, who crossed the Isthmus of Panama and the mountains of Bolivia, are now on their northeast descent, to meet the Brazilians. The movement, on both sides, is slow, but the white man is crowding close upon each flank of the savage, who now occupies but a narrow strip of land between the emigrants from Spain and Portugal—gradually working through the wilderness towards each other.

Crato belongs, partly, to my friend Don Antonio Cordoza. A few years ago, his father established a trading station here, where the Indians come in from the wild woods with sarsaparilla, Brazil nuts, chocolate, pitch, and guaraná, prepared from the seed of a fruit found in the woods, represented to be somewhat like the wild cherry. The Indians mash the seed between stones, and make a paste by adding water; after being dried in the sun, it is rolled in one pound weights, and is sold at the station at fifty cents per pound. Don Antonio sold guaraná in Trinidad at four dollars. The Spaniards are exceedingly fond of it; the price has been as high as eight dollars a pound, in the mountains of Bolivia. Guaraná resembles prepared chocolate; a small quantity grated in a tumbler of water with sugar, makes not only a very refreshing, but a strengthening drink. The Indians use it when hunting or marching, thinking it enables them to undergo a great amount of fatigue. The trader pays the Indian in rum, hatchets, knives, fish-hooks, beads, &c. We find four or five houses, inhabited by squatters, surrounded by a beautiful pampa country; here and there clusters of forest trees. On the plains the pasture proves excellent for the few cattle and horses that have been brought up the river. Quantities of chickens flourish about the house, with dogs and fat hogs.

The families are of Portuguese descent. A hamac was slung for me in a house with a parlor on one side and a small sugar-mill on the other. While the olive colored women sat sewing, the man was employed putting sugar-cane between the vertical wooden cylinders, as our men turned the beam by hand to get some sugar juice to refresh themselves. The people were extremely kind and attentive. Mrs. Santa Ana, the wife of the man to whom we brought letters, doctored us with chicken tea, declaring "people died with the fever in this country who would not eat."

The soil is well adapted to the growth of the sugar-cane. We are told the country far west is a prairie for a long distance, covered with fine pasture. The Indians are called "Muras;" they are fond of trading, and less warlike than some others, of whom little is known. They seem to be pleased with the difference between rum and sarsaparilla.

We remained here all night to give the men a rest, and try to get *one* night's sleep ourselves, but there was no rest with a high fever. The river water cooled in an earthen monkey was refreshing.

Our boat was well washed out, and the baggage restowed; a large hog killed for the men, and our chicken basket filled with fowls. We were requested to take charge of the mail, a handful of letters, and embarked with many thanks to our friends on the frontier.

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Soundings vary from seven to twenty-one and a half fathoms. At 3 p. m., thermometer, 92°; water, 86°; calm.

October 8.—During the night we had heavy rain, sharp lightning, and thunder from northeast. At 9 a. m, thermometer, 83°; water, 85°. At 3 p. m., thermometer, 88°; water, 86°. The rest at Crato has refreshed us all; the men pull stoutly; they are now civil and attentive, showing a desire to behave themselves well, though we find a free negro the most difficult character to control. The Indian attends to his duty without being told to do so. The negroes begin to fear a difficulty with us, and are coming round, not only to their daily work, with more spirit, but are particular to show us respect. We would decline an offer of a boat's crew of free negroes on another such expedition. We have felt that had these men not been aware we were well on our guard since they shot our dog, they would have murdered us without the least hesitation. They disputed our authority and wanted to let us know it.

In the afternoon, as a black cloud comes from the northeast, the wind turns up the sand on the beach and islands above the deep green foliage. As the thunder roars and lightning flashes, we leave the troubled waters of mid-channel and seek a safe little inlet in the bank, and secure the boat till the raging storm passes. On the west bank was a small town of the Muras Indians, built of palmetto wood, and thatched with the wild palm leaf; it appeared to be deserted. The banks were forty feet high, of red clay, and perpendicular. On the east side of the river there were patches of maize. The forest trees are of less height as we descend; long islands stretch from three to five miles, dividing the river in twain. At the mouth of a small, clear, green water stream, we met a party of Indians fishing in a log canoe. The men were naked, and the women dressed in frocks. On one of the sand islands was their temporary hut.

October 12.—At 9 a. m., thermometer, 83°; water, 86°. For the last three days we have passed through an uninhabited region, without meeting with obstructions to steamboat navigation. The current one mile per hour, and river in some places one mile wide. We met with a fishing "cuberta," at anchor. This vessel is an Amazon craft, used for trading up and down these rivers under sail, or polled, or towed along the bank when the river is low. We went alongside and purchased a dried "pirarucu" fish, which we all fancied the taste of at once; it was new both to us and to the Cuyaba negroes. Pirarucus are taken by the arrow, as they swim near the surface of the water; it has a small head and thick body, covered with scales; they are found here from six to eight feet long. After it is salted and dried in the sun, the

meat keeps well twelve months; boatmen toast or boil it without smothering it in potatoes; it has no offensive smell, like boiled dried cod-fish. We are told the fish called "peixe boi," (bull-fish,) of the Madeira, is the same as the "vaca-marina," (sea-cow,) of the Ucayali, though comparatively there are few taken. The captain of the "cuberta" was lounging about the vessel with his coat off, while one or two men were up the river in a small canoe fishing. The cable, by which the vessel swung to her anchor, was made of a black grass-like stuff, taken from a species of palm-trees found on the Rio Negro, called "piassába," said to last longer in the water than out of it. Different-sized ropes are made of the piassába, but the cordage of the vessel was generally of Kentucky hemp. Her measurement was not over sixteen tons, rigged schooner fashion. On deck, between the cabin and the forward house, was a large box filled with earth, on which the crew built a fire and cooked fish and turtle. We handed the captain a Bolivian silver dollar in payment for fish, which he seemed pleased to take, and gave us large copper coins in change. Titto, our negro sergeant, had to explain the value of Bolivian silver in Brazil money.

At Porto de Mataurá a guard-house is situated on the east bank. Richards climbed up the steep bank, and presented passports to the commander, who was kind enough to send an officer to offer us a house if we would remain. The officer returned again with a present of a couple of watermelons, said to be an uncertain remedy for fever and ague. They were small, only half ripe, but soon devoured, as they were the only refreshing thing we had seen, except a little sugar-cane, since leaving the fort. The suffering from fever was increased to agony when the same dose had been imprudently repeated. Drinking water was 87°, and the temperature of the air, in the shade, 89°. Under such circumstances fruits and melons are luxurious. The temptation is great, but the sick should be particularly guarded against using such injurious articles, however pleasant to the taste.

As we move on the lands become more elevated, and are better adapted for cultivation than others below Crato. The forest trees are small where the lands are free from inundation, corresponding to observations made as we floated into the middle of Madeira Plate, near Exaltacion. Small streams of water flow in from the east, while, on the west, "madres," or large pools, have an outlet through the bank. The rule is, high banks on the east side of the Madeira, and low to the west, with few exceptions. Springs are scarce. The water trickling down the blue, red, or yellow banks is the coolest, even after being bottled and

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stowed under our seats. The air is 96° Fahrenheit; the heat is very oppressive. Under us there are twenty-four feet water; in some places no bottom at one hundred and fifty-six feet. As the river rolls along straighter, we find more irregularity in the channel, and width, in some places, full one mile. On both banks we see small houses, with a few plantain and orange trees about them. These are the settlements of the descendants of the Portuguese. A canoe or two lay by the bank opposite each house. As we swiftly passed along, by the force of paddles—for the current was only one mile per hour—the bright moon rose up over the sea of foliage and lit our way to the town of Borba, on the 14th of October, 1852.

With a bundle of letters, I crawled up the steep bank to the house of Capitan Diogo, father of my friend Don Antonio. He ran his fingers through grey locks of hair, and laughed at the idea of a man's getting sick on such a voyage; gave me a horrible cup of tea made from the leaves of a bush found in the woods, which put me to sleep, as he was boasting of his extraordinary long travels up and down the rivers, and how he used to doctor himself. He was very cheerful until he counted the money brought from his son and partner, when he wanted to know "if that was all Antonio had made on his trip to Bolivia."

In the morning our baggage was brought up, and the soldiers turned over to the commander of police. Borba is a small town of three hundred inhabitants. Two rows of miserable wooden huts stand parallel with a most distressingly dilapidated church; bells, old and cracked, are hung under a small shed near the door. On the soil, whence the forest trees had been cleared, was a thick sod of small-bladed grass, on which a few poor, slim-looking cows were pasturing. Large and fat hogs came grunting at the door. The hot sun had deadened the wool on the backs of a few sheep, and in its place, a fleece of stright, grey hair came out as a substitute. When man forces the animal intended by God for a cold climate into a hot one, a new nature comes to the poor, panting creature's relief, and puts upon it a coat of cool hair, instead of the hot woollen one.

The Spaniards have forced the hog so high up on the Andes that he suffers every time he raises his bristles, and dies out of place; while the Portuguese find it impossible to produce good mutton or wool on the hot plains of the Amazon. Indians, in a warm climate, grease or oil their naked skins as a protection from the sun, or that the rains may slide off the more easy; while those we saw on the frozen mountain tops, clothed themselves in wool, and greased their insides with mutton.

They appear to understand perfectly why the earth was provided with meat and clothing.

The inhabitants of Borba are principally negroes, who are very noisy, both in-doors and out; one-half of them are slaves. Those of Portuguese descent are extremely indolent. We observed few children of any color. The women wear their hair put up behind with large tortoise-shell combs, fancifully carved. Their dresses are very short-waisted, which gives them a more awkward appearance than they really deserve. The men wear trousers, and a shirt with the tail outside, which looks cool. Neither sex walk out except to church, when they dress in deep black cloth and silks, with gold ornaments and diamonds in profusion, brought from the head-waters of the Tapajos—or to the river to bathe, when they leave almost all wearing apparel at home.

The houses are of one-story and long; there are no doors hinged between the rooms, only those opening to the street. Curtains are hung from the upper part of the doorways to within a few inches of the brick floor. One day a fresh breeze blew into the windows, and the draft through the doors raised up all the curtains, when we discovered the family seated on a rug, spread on the floor, sewing. The girls were pretty, with large deep black eyes and hair; they quickly pulled their little bare feet under their dresses, and laughed heartily at the sudden surprise. Their hair was all down; hooks and eyes not fastened. The lady of the house was very kind on her side of the curtain, handed Quinine and Port wine on our side to the Capitan, who declared he could cure the fever in a short time. He insisted upon my joining him every night at ten in a hot supper; at the same hour in the morning at breakfast, and disapproved of sleeping—which was all we wanted, except to get out of the country as soon as possible. Our bread was made of Richmond flour, which is said to keep better in this climate than more northern flour from the United States. Whether this is owing to the mode of grinding the grain, or a difference in the character of the wheat itself, is to be tested. Turtle and chicken were the principal meats, with coffee and Portuguese red wine. The tobacco, which is produced on the banks of the Madeira, is said to be superior in quality to any in Brazil. It is made up in rolls, seven feet long and three inches in diameter, carefully wrapped up in a strip of rattan closely wound round it. Each staff contains two pounds; bundles of them are exported, with cacao, Brazil nuts, coffee, and sarsaparilla, to the Atlantic coast.

The trade of Borba is insignificant. According to Capitan Diogo's account, there are not more than two thousand people, Indians and all,

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inhabiting the banks of the Madeira, principally found near the stream; the country in the interior being a wilderness, tangled, matted, and in places swampy, where alligators bask in the sun on the beaten-down grass, and tigers roam freely after tapir tracks. At the small farms, near Borba, sugar-canes are raised and rum is manufactured—a greater quantity of the latter article being consumed in Brazil, the trade in it seems to be the most extensive of *all* others. A few watermelons, oranges, and limes are raised, but less than are required for home consumption.

There were no men belonging to Borba to take us on. The authorities ordered the soldiers who came with us to go on. I regretted this for two reasons. One, that we were in hopes of getting rid of these impudent, half-savage free negroes, who refused positively to obey the authorities of the town. Another, that the commander of Beira wished me to send them back as soon as possible after we arrived here, as it would take them five months to regain their posts. But I found they were obliged to go as far as Barra do rio Negro, to purchase a little iron, which, with some guaraná, they had been ordered to carry to the fort, and to our surprise, the men wanted to go with us in preference to remaining in Borba, or returning to their usual duties. A larger boat was fitted out. Pedro, our pilot, was paid off, as his services were needed as boat-builder by the Capitan, who filled our basket with chickens, and gave us a water-cooler. Two large cakes, with a jar of preserved oranges, were sent to the boat by the wife of our friend Don Antonio, whose little child came to thank us for bringing letters from the father and husband. The kind old Capitan gave me particular instructions about the fever, which he had partly cured, while he nearly killed the patient. We pushed off with three Portuguese passengers.

The river was thirty feet above its present level, in the rainy season, and has now thirty feet depth off Borba. A vessel may lay moored to the bank of the river. There is stone at hand for building wharves if needed. The northeast trade-winds blow fresh, and we find a difficulty in making head-way; the current of the river has slackened to half a mile per hour. The winds blow directly in opposition to it, which baffles us considerably. In the evening, the wind falls away, and we push off from the bank where the boat is fastened, to hold what we have gained.

At some small huts we find Muras Indians sleeping, who seem very indifferent about selling a few thick-skinned, insipid oranges.

Among the heavy night dews are intermingled an equal portion of hungry musquitoes. The nights and mornings are beautifully clear.

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By Lieut L. Gibbon. U.S.N.

Lith. of P.S. Duval & C° Phil.

CROSSING THE MOUTH OF THE MADEIRA RIVER. Brazil.

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On the afternoon of the 29th of October, we crossed the river from the east to the west bank, being forced to do so, as the wind created a sea, and we lay uncomfortably moored to a snag; when half way over, our little craft struggled and dipped in the water. Richards bailed out manfully, while the men became frightened; we kept her bow angling the sea till she reached in safety the opposite shore, where the negroes, hearts returned to their places, but their eyes stretched wide open, as they looked back at the troubled stream, saying they never saw water behave so furious before.

During the 21st of October we lay all day by a sand island, unable to proceed until evening. When the wind died away, we paddled on by the light of the moon. As the negroes lifted their paddles out of the water, we dipped the thermometer in the Madeira for the last time, 88° Fahrenheit. Suddenly, the bow of our little canoe touched the deep waters of the mighty Amazon. A beautiful, apple-shaped island, with deep green foliage, and sandy beach encircling it, lies in the mouth of the great serpentine Madeira. The mouth opens by two channels. We find seventy-eight feet depth, near the western side, which is six hundred yards wide, with high banks, well wooded, but no marks or traces of civilization. A long sand-spit hung out over the lower mouth, like a great tongue, on which lay turtles and bird's eggs. The east side of the mouth was about three-quarters of a mile wide. A few houses stood on the back ground, where the country was more elevated towards the southeast.

Now that we are at the mouth of this magnificent stream, we find no deeply loaded vessels enter it. The value of the present foreign trade of South Peru and Bolivia may be worth ten millions of dollars per annum.

The distance from the foot of San Antonio falls to the mouth of the Madeira, is five hundred miles by the river. A vessel drawing six feet water may navigate this distance at any season of the year. A cargo from the United States could reach the foot of the falls, on the Madeira, within thirty days. By a common mule road, through the territory of Brazil, the goods might be passed from the lower to the upper falls on the Mamoré, in less than seven days, a distance of about one hundred and eighty miles; thence by steamboat, on that river and the Chaparé, a distance of five hundred miles to Vinchuta, in four days. Ten days more from the base of the Andes, over the road we travelled, would make fifty-one days passage from Baltimore to Cochabamba, or fifty-nine days to La Paz, the commercial emporium of Bolivia, where cargoes

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arrive generally from Baltimore in one hundred and eighteen days, by Cape Horn—often delayed on their way through the territory of Peru from the seaport of Arica. Goods by the Madeira route, sent over the Cordillera range to the Pacific coast, might get there one month before a ship could arrive from Europe on the eastern coast of the United States, by two oceans or the old route.

APPENDIX.

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OBSERVATIONS WITH SEXTANT AND ARTIFICIAL HORIZON.

Locality.	Date.	Star.	Meridian altitude.	Sun's altitude.	Magnetic azimuth.	Index error.	Remarks.
SOUTH PERU.							
	1851.		° ′ ″	° ′ ″	° ′	′ ″	
Juaja	July 10	Alpha Centauri	−83 07 40				
Huancayo	13	Alpha Centauri	−83 44 20				Hazy over the northern mountains.
Huancavelica	18	Alpha Centauri	−85 07 40				Northern sky cloudy.
Ayacucho	30	Alpha Lyrae	+76 25 10			+1 30	Misty over the northern Cordilleras.
Do	31	Alpha Trianguli	−68 52 40			−1 00	
Do	31	Alpha Lyrae	+76 27 00			−1 00	
Camp	Aug. 6	Alpha Trianguli	−69 24 20			−1 00	
Do	6	Alpha Lyrae	+75 53 20			−1 00	
Andahuailas	11	Alpha Lyrae	+75 26 10			−1 00	
Do	12					−0 45	Missed a southern star.
Do	12			76 24 10	41 40	−0 45	
Do	12			78 19 20	40 10	−0 45	
Do	12			79 31 50	39 50	−0 45	
Abancay	15	Alpha Lyrae	+75 30 00	80 21 30	39 20	−0 45	
Do	15	Alpha Pavonis	−92 54 20			−0 45	
Cuzco	27					−0 45	
Do	27			37 35 10	273 50	−0 25	
Do	27			31 32 30	273 45	−0 25	
Do	Sept. 4	Alpha Lyrae	+75 43 20	30 40 50	273 30	−0 25	
Do	4	Alpha Pavonis	−92 39 50			−0 25	
						−0 25	
BOLIVIA.							
Cochabamba	Dec. 22	Alpha Aurigae	+ 53 35 30				
Do	22	Alpha Argus	−109 36 00				Señor Bridoux's pateo.
	1852.						Do.
Trinidad de Mojos	June 2	Gamma Crucis	−97 09 40				
Do	2	Zeta Ursae Majoris	+39 02 10				
Do	3			41 32 20	48 30		
Do	3			45 35 40	47 00		
Do	3			46 44 00	46 45		
Do	3			48 14 10	46 15		
Exaltacion	Aug. 24	Alpha Lyrae	+76 05 30				
Do	25			47 35 10	277 45		On the bank of the river Mamoré, near the sugar-mill.
Do	25			46 21 10	277 15		
Do	25			45 04 10	277 00		
Do	29	Alpha Lyrae	+76 07 10				
BRAZIL.							
Forté do Principe da Beira	Sept. 11	Alpha Lyrae	+77 55 40				
Do do	12	Alpha Lyrae	+77 52 40	65 21 00	68 00		
Do do	12			67 20 10	67 45		
Do do	12			68 27 50	67 15		
Do do	12			69 16 50	67 10		
Do do	13	Alpha Lyrae	+77 50 30				
Near the mouth of Stenez river	16	Alpha Lyrae	+78 45 20				
Ribeiraó falls, Madeira river	23	Alpha Pavonis	−86 01 30				Missed the northern star.

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METEOROLOGICAL OBSERVATIONS.

Locality.	Date.	Hour.	Barometer.	Fah. Therm.	Boiling point.	Fah. Therm.	Wet bulb.	Wind—force.	Remarks.
SOUTH PERU.									
	1851.			°		°	°		
Tarma	July 4	3 p. m.	21.048	55	.....	.....	52	SW.	Squally, cloudy, and thundering.
Do.	4	9 p. m.	21.098	55	.....	.....	54	.....	
Do.	5	9 a. m.	21.110	53	.....	.....	51	.....	Calm and cloudy.
Do.	5	1 p. m.	.....	.....	193.852	56	.....	.....	
Do.	5	4 p. m.	21.056	56	.....	.....	53	.....	
Do.	5	9.30 p. m.	21.100	55	.....	.....	54	.....	
Do.	6	9.30 a. m.	21.108	54	.....	.....	52	.....	Clear and pleasant.
Do.	7	3.30 p. m.	21.046	58	.....	.....	53	.....	Clear.
Do.	9	8 a. m.	21.134	54	.....	.....	50	.....	Clear.
On the road	9	12.30 p. m.	.....	68	.....	.....	.....	.....	Temperature of a mountain stream, 55°.
Inca road	9	5 p. m.	.....	44	.....	.....	.....	.....	Clear blue sky.
U. S. tent	10	6.30 a. m.	18.582	24	.....	.....	30	.....	Frost and ice.
Do.	10	9.30 a. m.	.....	.....	187.000	27	.....	.....	Clear.
Do.	10	10 a. m.	.....	46	.....	.....	.....	.....	Temperature of a spring, 48°.
Juaja	10	4 p. m.	20.248	65	.....	.....	.....	.....	
Do.	10	4.45 p. m.	.....	73	.....	.....	50	.....	Clear.
Do.	10	6.15 p. m.	.....	.....	191.250	44	.....	.....	
Do.	11	8 a. m.	20.312	46	.....	.....	.....	.....	
Concepcion	11	3.30 p. m.	20.454	62	.....	.....	.....	.....	
Do.	12	7 a. m.	20.560	49	190.500	49	46	.....	Cumulus strata, 9.
Do.	12	12.25 p. m.	.....	63	.....	.....	.....	.....	Temperature of a spring, 54°.
Do.	12	12.45 p. m.	.....	60	.....	.....	.....	.....	Light shower of rain from the eastward—small drops.
Huancayo	12	2.30 p. m.	20.628	62	.....	.....	.....	.....	Calm.
Do.	13	7 a. m.	20.732	48	.....	.....	.....	.....	
Do.	13	6.15 p. m.	20.652	55	.....	.....	.....	.....	
Do.	14	7 a. m.	20.706	33	.....	.....	30	.....	Cumulus strata; frost.
Do.	14	8.48 a. m.	.....	48	.....	.....	.....	.....	Temperature of a spring, 54°.
Nahuinpucyo	14	5 p. m.	19.626	50	.....	.....	.....	NW.	Thunder, lightning, hail, and rain storm.
Do.	14	5.45 p. m.	.....	46	.....	.....	.....	.....	
Do.	15	7 a. m.	19.718	42	.....	.....	46	.....	
Escuchaca	15	3 p. m.	21.492	63	.....	.....	.....	.....	
Do.	15	5 p. m.	.....	.....	.....	.....	.....	N.	Heavy rain squalls—large drops, (unusual.)
Do.	16	8.30 a. m.	21.648	60	192.500	60	54	.....	Temperature of a stream, 50°.
Do.	16	9.20 a. m.	.....	65	.....	.....	.....	.....	
On the road	16	Noon	20.058	69	.....	.....	.....	.....	Andes chain in sight to the northeast; no snow.
Top of the mountains	16	3.25 p. m.	19.160	55	.....	.....	.....	.....	
Indian hut	16	4.20 p. m.	19.764	57	.....	.....	.....	.....	
Do.	17	6 a. m.	19.748	35	.....	.....	30	.....	Frost; cold night.
Do.	17	11.30 a. m.	.....	54	.....	.....	.....	.....	Temperature of a spring, 44°.
Do.	17	1 p. m.	17.684	49	.....	.....	.....	N.	Snow in all directions—wild country.
Huancavelica	17	6 p. m.	19.588	50	.....	.....	.....	.....	
Do.	18	7.45 a. m.	19.632	46	.....	.....	.....	.....	
Mouth of quicksilver mine	19	12.30 p. m.	.....	49	.....	.....	.....	.....	Temperature of a small stream flowing out of the mine, 34°.
Inside Santa Barbara mine	19	2 p. m.	.....	54	.....	.....	.....	.....	
Huancavelica	22	7 a. m.	19.584	48	.....	.....	.....	.....	
On the road	22	11.30 a. m.	.....	54	.....	.....	.....	.....	Cloudy and calm; temperature of a spring, 48°.
Do.	22	2.30 p. m.	.....	44	.....	.....	.....	NE. and SW.	Light snow storm from the northeast—small fleecy flakes; wind hauled round by south to southwest; storm increased to hail-stones.
Molina Posta	22	4.45 p. m.	19.160	50	.....	.....	.....	.....	
Do.	22	7 p. m.	.....	39	.....	.....	.....	SW.	Hail-stones half the size of peas.
Do.	23	7 a. m.	19.222	37	.....	.....	.....	SE., light	Cloudy.
Pancra	23	5 p. m.	19.284	44	.....	.....	.....	.....	
Do.	23	6 p. m.	.....	.....	.....	.....	.....	.....	Rain; thick clouds; thunder and lightning in the north.
Do.	24	6.30 a. m.	19.282	35	.....	.....	32	.....	Cloudy, and thick frost.
Parcos Posta	24	1.45 p. m.	19.490	56	.....	.....	.....	.....	Thermometer in the shade stands at 76°.
Do.	24	5 p. m.	.....	43	.....	.....	39	SW.	Squalls of rain, with thunder and lightning.
Do.	25	6 a. m.	19.468	36	.....	.....	.....	.....	Calm.
Do.	25	9.20 a. m.	.....	48	.....	.....	.....	.....	Temperature of a spring, 52°.
Marcos Posta	25	2.30 p. m.	20.238	57	.....	.....	.....	NE.	Clear.
Do.	25	6 p. m.	.....	.....	.....	.....	.....	SW.	Lightning, thunder, and light rain.
Do.	26	6.30 a. m.	20.258	38	.....	.....	.....	.....	Clear; very little dew during the night.
Huanta	26	3 p. m.	22.068	65	.....	.....	.....	.....	Light breezes.
Do.	27	9.15 a. m.	22.286	60	.....	.....	55	.....	Clear.
Do.	27	4 p. m.	22.092	63	.....	.....	.....	.....	
Do.	28	9 a. m.	22.224	59	.....	.....	.....	.....	
Do.	28	10 a. m.	.....	.....	195.250	59	58	.....	Clear.
Do.	28	5.30 p. m.	22.118	62	.....	.....	.....	.....	
Do.	28	11.45 p. m.	.....	.....	.....	.....	.....	.....	Clear night; the whole heavens are lighted up by lightning.
Do.	29	9.20 a. m.	22.258	60	.....	.....	56	.....	
Do.	29	3 p. m.	21.162	62	.....	.....	.....	.....	
Do.	30	7 a. m.	22.210	59	.....	.....	.....	.....	
On the road	30	3.40 p. m.	21.976	75	.....	.....	.....	.....	These observations were taken at the bottom and top of a deep gully washed by the rains.
Do.	30	4 p. m.	21.674	71	.....	.....	.....	.....	

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METEOROLOGICAL OBSERVATIONS—Continued.

Locality.	Date.	Hour.	Barometer.	Fah. Therm.	Boiling point.	Fah. Therm.	Wet bulb.	Wind—force.	Remarks.
	1851.			°		°	°		
Ayacucho	July 30	10.40 p. m.	21.976	61					
Do	31	9 a. m.	22.006	58			54		Clear and calm.
Do	Aug. 1	9 a. m.	22.008	59	194.250		53		
Do	4	8.30 a. m.	21.936	59			54		Cumulus strata.
On the road	4	3.30 p. m.	21.246	67				NE.	Cumulus, 5; near Precervilca.
Do	5	6 a. m.	21.368	43					Cumulus strata, 10.
Matara Posta	5	3 p. m.	20.304	60				NE.	Cumulus clouds.
Do	6	6.20 a. m.	20.338	33			33		
Gorge in the Andes	6	10 a. m.	18.550	46					
Near Rio Pampas	6	3.15 p. m.	22.780	73					
Do	6	7.30 p. m.							Lightning towards the east.
Do	7	7 a. m.	22.868	52					Cumulus strata, 3.
Bombon Posta	7	3 p. m.	21.534	71					
Do	8	7 a. m.	21.616	52			51		Cumulus strata, 10; calm.
Camp Ladron	8	2 p. m.	19.648	50					Heavy fog clearing away.
Do	9	6.15 a. m.	19.692	39			37	SE.	Snowing during the night.
Camp Corn Stalks	9	1 p. m.	20.598	55					
Do	10	6.30 a. m.	20.528	41					Clear.
Andahuialas	10	12.30 p. m.	21.468	59					Cumulus cloudy.
Do	11	9 a. m.	21.536	53			51		Cumulus cloudy.
Do	11	9.45 a. m.			192.500	53			
Do	11	3.15 p. m.	21.478	58			55		Clear.
Do	12	10 a. m.	21.592	55			54		Calm.
Do	12	3 p. m.	21.532	59			55		Clear.
Do	13	7.15 a. m.	21.604	53			51		Cumulus clouds; calm.
Pincor Posta	13	3.30 p. m.	22.364	65					
Do	14	6 a. m.	22.416	38			36		Cool morning; bright moonlight night, with dew.
Do	14	9 a. m.		60					Temperature of a spring, 46°.
Inca Fort Quaramba	14	10.30 a. m.	19.500	59					
Carquacahua Posta	15	6.15 a. m.	21.932	44					No water to take wet bulb.
Abancay	15	1 p. m.	22.740	77					Snow on the mountains in sight.
Do	16	7 a. m.	22.826	57			49	E.	Cumulus, 8.
Do	16	5.30 p. m.			196.250	56			Clear.
Do	17	6 a. m.	22.840	44					Warm sun and clear sky.
Do	17	9 a. m.		54					Temperature of a mountain stream, 46°.
Do	17	11 a. m.		55					Temperature of a spring, 54°; sun, 60°.
Hacienda Lucmoj	17	3.15 p. m.	22.224	72				NE.	Clear.
Do	18	5.45 a. m.	22.360	53			47		Cumulus strata, 9.
Apurimac river	18	11 a. m.	24.578	82					
Banca Posta	18	2.10 p. m.	21.708	78				W	Clear.
Do	19	6.30 a. m.	21.816	53					Cumulus strata.
Mollepata	19	11.30 a. m.	21.776	70					
Do	20	6 a. m.	21.776	51			48		Cumulus strata.
Lima-Tambo	20	11.30 a. m.	22.000	67					Clear.
Do	21	5.45 a. m.	22.500	52					
Near Sureti	21	12.30 p. m.	20.388	65					
Do	21	1.15 p. m.		41				SE.	Heavy hail storm; stones soft, the size of peas.
Do	22	6.15 a. m.	20.450	44					Cumulus strata.
Cuzco	23	8 a. m.	20.338	57			55		
Do	24	9.30 a. m.	20.330	56					
Near Urubamba river	Sept. 17	6 a. m.	20.836	50				SE.	Cumulus, 9.
Paurcartambo	17	6.30 p. m.	21.544	56					
Do	18	8 a. m.	21.546	52					Cumulus.
Totora farm	19	5 p. m.	21.842	68					Calm.
Do	20	5.45 a. m.	21.884	45					Calm.
Top of eastern ridge of Andes	20	10 a. m.	20.170	54				E.	Thick fog passing over the tops of the Andes; rain, and thunder-claps.
Cherimayo creek	20	4 p. m.	24.044	61					
Do	21	5.45 a. m.	24.088	49					Dew falls heavy during the night.
Cueba farm	21	12.40 p. m.	26.698	74					
Do	22	6 a. m.	26.698	62					Foggy and calm.
Do	22	9.45 a. m.		74					Temperature of Rio Tono water, 63°.
St. Miguel farm	22	12.45 p. m.	27.918	81					Cumulus.
Do	23	7.30 a. m.	28.038	68					Cumulus, calm.
Chuncho's Territory	25	9 a. m.		77					
Do	25	10 a. m.							Thermometer in the sun, 92°; temperature of Tono river water, 72°.
Do	25	4.30 p. m.	28.338	74					
Do	26	1 p. m.							Thermometer in the sun, 100°; temperature of Cosnipata river water, 70°; cumulus, 3.
River Piñipiñi	Oct. 1	Sundown.	28.372	72					
Head of river Madre de Dios, or Purus	2	9 a. m.	28.594	74					Cloudy.

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METEOROLOGICAL OBSERVATIONS—Continued.

Locality.	Date.	Hour.	Barometer.	Fah. Therm.	Boiling point.	Fah. Therm.	Wet bulb.	Wind—force.	Remarks.
									Extract from Padre Revello's journal at San Maguil farm.
	1850.			°		°	°		
San Maguil farm	Jan. 1	2 p. m.		86					
Do	2	9 a. m.		72					
Do	2	2 p. m.		86					
Do	4	9 a. m.		72					Cloudy.
Do	4	2 p. m.		86					
Do	Feb. 1								At mid-day raining in the Cerros to northwest.
	1851.								Cloudy and sunshine.
Do	Mar. 24								
Do	May							E.	Heavy rain and gale.
Do	June 8								At night, thermometer 68°; morning, 72°; afternoon, 80°; sundown, 72°.
Do	13			68				SE.	Gale, with thunder, lightning, and rain.
Do	July 1	Daylight		66				E.	Raining all day.
Do	1	2 p. m.		81					Sundown, 74°.
Cuzco	Oct. 25	6.15 a. m.			191.500	59			
Santa Rosa	Nov. 2	6 p. m.			187.750	50		E.	Fresh; cumulus clouds.
Ayavire	4	3 p. m.			188.250	57	52		Cloudy.
Pucará	5	5 p. m.			188.250	58	50		Thunder in the north.
Lampa	6	6.30 p. m.			188.250	53	45	E.	Cold and cloudy.
Caracota	8	4.30 p. m.			188.500	59	44		
Puno, near Lake Titicaca	10	12.30 p. m.			188.500	54		E.	Cumulus strata.
Do	11	9 a. m.				54	50	E.	Cloudy.
Do	11	3 p. m.				56	50	E.	Cloudy.
Do	12	9 a. m.				58	48	E.	Clear.
Do	12	3 p. m.				59	49	E.	Clear.
Do	13	9 a. m.				56	48	E.	Cloudy.
Do	13	3 p. m.				65	51	E.	Cloudy.
Do	14	9 a. m.				56	49	E.	Cloudy.
Do	14	3 p. m.				59	51	E.	Cloudy.
Chueinto	15	5.15 p. m.			188.250	56	49	E., fresh	Temperature of Titicaca lake water, 64°; thunder in the north, with heavy rain-storm there.
	16	6.30 p. m.			188.750	60	48	NW.	Rain, thunder, and chain-lightning.
Ylave	17	7.30 a. m.				50	43		Clear and calm: no dew or frost.
Do	17	5.30 p. m.			188.500	56	46		Clear.
Juli	18	7 a. m.				45	38	E.	
Do	18	9.15 a. m.				56			Temperature of water of a stream flowing into Lake Titicaca, 50°.
Do					188.750	58	45	N.	Cumulus.
Tambillo Posta	18	5 p. m.			189.000	57	50	E.	Cumulus.
Zepita	19	6 p. m.							
BOLIVIA.									
Huaqui	20	3.30 p. m.			188.750	56	45	E.	Cumulus, 5.
Tambillo Posta	21	4.20 p. m.			188.500	58	46	W., fresh	Appearances of rain.
La Paz	27	9 a. m.				52	48	SE.	Cloudy.
Do	27	3 p. m.				60	52	SE.	Cloudy.
Do	28	10 a. m.			188.800	56	51	SE.	Cloudy.
Do	28	3 p. m.				59	54	SE.	Cloudy.
Do	29	9 a. m.				52	48	SE.	Clear.
Do	29	3 p. m.				56	48	NW.	Cloudy.
Do	30	9 a. m.				54	50	SE.	Cloudy.
Do	30	3 p. m.				58	53	SE.	Cloudy.
Do	Dec. 1	9 a. m.				53	48	SE.	Light rain.
Do	1	3 p. m.				55	51	SE.	Cumulus.
Do	2	3.30 p. m.			188.000	52	42	SE.	Cumulus strata.
Ventilla Posta	3	3.45 p. m.			187.500	49	40	SE.	Rain-storm; thunder and lightning; wind hauls by south to west.
Calamarca									
	4	5 p. m.			188.750	58	42	SE.	
Chicta Posta	5	4 p. m.			189.400	57	46	SE.	Clear.
Aroma	6	5 p. m.			189.000	60	42		Cumulus.
Caracollo	7	4 p. m.			188.800	59	46		
Condorchenoca	8	10 a. m.				60			Temperature of a spring, 68°.
On the road	8	5.30 p. m.			188.000	59	46		Cumulus.
Challa	9	7 a. m.				41	36		Clear, with heavy frost, and calm.
Do	9	11 a. m.					66		Temperature of a mountain stream, 107°; another flowing into it, 70°, and the mingled waters, 104°.
Edge of Madeira Plate									
	9	2.30 p. m.			194.400	72	60		Cumulus, 6.
Tapacari	9	3.30 p. m.							Rain; hailstones as large as peas; heavy claps of thunder, and chain-lightning close about the expedition.
On the road									
	10	8 a. m.			196.750	70	61		Clear and calm, moonlight night.
Zizque	13	9 a. m.				68	60	SE.	Cloudy.
Cochabamba									

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METEOROLOGICAL OBSERVATIONS—Continued.

Locality.	Date.	Hour.	Barometer.	Fah. Therm.	Boiling point.	Fah. Therm.	Wet bulb.	Wind—force.	Remarks.
	1851.			°		°	°		
Cochabamba	Dec. 13	3 p. m.				70	60	SE.	Cloudy
Do	14	9 a. m.				66	58	SE.	Cloudy
Do	14	3 p. m.				72	62	SE.	Cloudy
Do	15	9 a. m.				68	56	SE.	Raining at mid-day.
Do	15	3 p. m.				76	62	SE.	Clear.
Do	16	9 a. m.				68	61	SE.	Cloudy.
Do	16	3 p. m.				70	61	SE.	Cloudy.
Do	17	9 a. m.				69	61	NE.	Cloudy.
Do	17	3 p. m.				74	64	SE.	Cloudy.
Do	18	9 a. m.				68	60	SE.	Cloudy.
Do	18	3 p. m.				76	62	SE.	Cloudy.
Do	19	9 a. m.				72	58	SE.	Cloudy.
Do	19	3 p. m.				72	60	SE.	Cloudy.
Do	20	9 a. m.				70	60	SE.	Cloudy; for the last eight days lightning has been flashing at night towards the southeast.
Do	20	3 p. m.				78	64	SE.	Cloudy.
Do	21	9 a. m.				70	61	SE.	Cloudy.
Do	21	3 p. m.				78	64	SE.	Cloudy.
Do	21	11.45 p. m.				72	.....	SE.	One heavy shock of an earthquake; atmosphere impregnated with sulphur.
Do	22	9 a. m.				70	56	SE.	Clear.
Do	22	3 p. m.				78	62	SE.	Cloudy.
Do	23	9 a. m.				72	62	SE.	Clear.
Do	23	3 p. m.				78	64	SE.	Cloudy.
Do	23	5.30 p. m.				.....	.....	SE., fresh	Rain-storm.
Do	24	9 a. m.				72	62	SE.	Clear.
Do	24	3 p. m.				78	66	SE.	Cloudy.
Do	25	9 a. m.				72	64	SW.	Foggy.
Do	25	12.45 p. m.				.....	.....	SE.	Rain.
Do	25	3 p. m.				74	60	SE.	Cloudy.
Do	26	9 a. m.				72	62	SW.	Cloudy.
Do	26	3 p. m.				80	63	NE.	Cloudy.
Do	27	9 a. m.				70	60	NE.	Cloudy.
Do	27	3 p. m.				78	60	NE.	Cloudy.
Do	28	9 a. m.				72	60	NE.	Cloudy.
Do	28	11 a. m.			196.250	72	.....		
Do	28	3 p. m.				80	63		
Do	29	9 a. m.				72	60	NE.	Cloudy.
Do	29	3 p. m.				80	60	NE.	Cloudy.
Do	30	9 a. m.				70	58	NE.	Cloudy.
Do	30	3 p. m.				76	60	SE.	Cloudy.
Do	31	9 a. m.				70	60	SE.	
Do	31	3 p. m.				66	58	SE.	Cloudy.
	1852.								
Do	Jan. 1	9 a. m.				74	58	SE.	Cloudy.
Do	1	3 p. m.				71	63	SE.	Cloudy.
Do	2	9 a. m.				59	54	SE.	Rain.
Do	2	3 p. m.				70	62	SE.	Cloudy.
Do	3	9 a. m.				68	58	SE.	Clear.
Do	3	3 p. m.				74	63	SE.	Cloudy.
Do	4	9 a. m.				70	59	SE.	Clear.
Do	4	3 p. m.				76	62	SE.	Cloudy.
Do	5	9 a. m.				71	62	SE.	Cloudy.
Do	5	3 p. m.				76	59	SE.	Clear.
Do	6	9 a. m.				62	58	SE.	Rain.
Do	6	3 p. m.				68	61	SW.	Cloudy.
Do	7	9 a. m.				64	60	SE.	Rain during the night.
Do	8	9 a. m.				68	61	NW.	Cloudy.
Do	8	3 p. m.				72	62	NW.	Cloudy.
Do	9	9 a. m.				65	60	NW.	Cloudy.
Do	9	3 p. m.				73	60	SE.	Cloudy.
Do	10	9 a. m.				60	55	SE.	Rain.
Do	10	3 p. m.				70	58	SE.	Cloudy.
Do	11	9 a. m.				66	58	SE.	Clear.
Do	11	3 p. m.				72	62	SE.	Cloudy.
Do	13	9 a. m.				64	62	SE.	Cloudy.
Do	13	3 p. m.				78	68	SE., 5	
Do	14	3 p. m.				72	64	SW., 5	Passing temporary showers.
Do	15	9 a. m.				55	55	SE., 5	Lightning; small drops of rain.
Do	15	3 p. m.				62	66	SW., 1	Rain.
Do	16	9 a. m.				60	60	SE., 1	Continued rain.
Do	16	3 p. m.				68	64	SW., 1	Cloudy.
Do	17	9 a. m.				60	60	Calm	Lightning, thunder, and rain.
Do	17	3 p. m.				66	64	SE., 1	Lightning, thunder, and passing showers.
Do	18	9 a. m.				64	64	SE., 1	Thunder and rain.
Do	18	3 p. m.				70	64	SW., 1	Cloudy and thunder.
Do	19	9 a. m.				64	61	SE., 2	Lightning, thunder, and passing clouds.
Do	19	3 p. m.				66	59	SE., 4	Gloomy; thunder, lightning, and rain.

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METEOROLOGICAL OBSERVATIONS—Continued.

Locality.	Date.	Hour.	Barometer.	Fah. Therm.	Boiling point.	Fah. Therm.	Wet bulb.	Wind—force.	Remarks.
	1852.			°		°	°		
Cochabamba	Jan. 20	9 a. m.				60	59	SW., 1	Misty; thunder and lightning.
Do	20	3 p. m.				72	64	SE., 1	Cloudy.
Do	21	9 a. m.				62	60	SW., 1	Thunder, lightning, and cloudy.
Do	21	3 p. m.				70	63	Calm	Thunder and cloudy.
Do	22	9 a. m.				60	58	SW	Thunder and lightning.
Do	22	3 p. m.				70	64	SE., 1	Cloudy.
Do	23	9 a. m.				62	59	SW., 1	Lightning.
Do	23	3 p. m.				72	64	SW., 2	Cloudy.
Do	24	9 a. m.				57	56	SW., 1	Lightning and thunder.
Do	24	3 p. m.				66	60	SW., 1	Rain.
Do	25	9 a. m.				58	59	SE., 1	Rain, lightning, and thunder.
Do	25	3 p. m.				62	60	NE., 1	Drizzling rain.
Do	26	9 a. m.				60	58	SW., 1	Rain.
Do	26	3 p. m.				63	60	SW., 1	Rain.
Do	27	9 a. m.				63	60	SW., 1	Rain, thunder, and lightning.
Do	27	3 p. m.				71	67	Calm	Cloudy.
Do	28	9 a. m.				58	58	Calm	Rain, thunder, and lightning.
Do	28	4 p. m.				68	62	Calm	Cloudy.
Do	29	9 a. m.				55	60	SW	Rain, thunder, and lightning.
Do	29	3 p. m.				59	57	Calm	Rain.
Do	30	9 a. m.				59	57	SW., 2	Passing showers.
Do	30	3 p. m.				69	62	NE., 1	Misty.
Do	31	9 a. m.				58	56	Calm	Blue sky, with hazy atmosphere.
Do	31	3 p. m.				69	59	SW	Cloudy.
Do	Feb. 1	9 a. m.				60	58	NE., 1	Passing clouds, with thunder.
Do	1	3 p. m.				72	63	Calm	Cloudy.
Do	2	9 a. m.				65	61	Calm	Cloudy, with thunder; rain and hail—large stones.
Do	2	3 p. m.				69	63	SE., 6	Large drops of rain, and thunder.
Do	3	9 a. m.				54	54	SW., 5	Rain, hail, thunder, and lightning.
Do	3	3 p. m.				61	59	Calm	Continued rain.
Do	4	9 a. m.				60	58	SE., 2	Cloudy.
Do	4	3 p. m.				68	61	SW., 1	Cloudy.
Do	5	9 a. m.				58	56	Calm	Cloudy.
Do	5	3 p. m.				60	59	Calm	Cloudy.
Do	6	9 a. m.				62	60	E., 1	Cloudy.
Do	6	3 p. m.				71	63	Calm	Cloudy.
Do	7	9 a. m.				60	62	SE., 1	Cloudy; shower from northeast.
Do	7	3 p. m.				72	64	NW., 1	Cloudy.
Do	8	9 a. m.				64	60	Calm	Cloudy.
Do	8	3 p. m.				72	63	SW., 1	Cloudy.
Do	9	9 a. m.				62	60	SE., 1	Cloudy.
Do	9	3 p. m.				74	68	SW., 2	Cloudy, with thunder.
Do	10	9 a. m.				62	60	SW., 2	Cloudy; lightning and thunder, and shower of rain.
Do	10	3 p. m.				62	60	SE., 3	Rain, thunder, and lightning.
Do	11	9 a. m.				63	60	SW., 1	Cloudy; thunder and chain lightning; snowing on the mountains.
Do	11	3 p. m.				72	62	SE., 4	Cloudy, with thunder.
Do	12	9 a. m.				64	60	Calm	Cloudy; thunder and lightning.
Do	12	3 p. m.				74	63	SW., 1	Cloudy.
Do	13	9 a. m.				64	61	SE., 3	Cloudy.
Do	13	3 p. m.				72	63	NE., 1	Cloudy.
Do	14	9 a. m.				63	61	SE., 5	Rain; large drops.
Do	14	3 p. m.				73	64	SE., 3	Cloudy.
Do	15	9 a. m.				60	58	Calm	Cloudy; lightning to the northward and eastward, with thunder.
Do	15	3 p. m.				73	63	SW., 2	Cloudy.
Do	16	9 a. m.				62	58	Calm	Cloudy; thunder and lightning; rain on the mountains.
Do	16	3 p. m.				74	61	SE., 4	Cloudy.
Do	17	9 a. m.				59	59	Calm	Cloudy.
Do	17	3 p. m.				70	63	Calm	Cloudy.
Do	18	9 a. m.				56	57	Calm	Rain, lightning, and foggy.
Do	18	3 p. m.				69	61	SE., 1	Cloudy.
Do	19	9 a. m.				64	60	SW., 1	Cloudy; lightning, with rain on the mountains.
Do	19	3 p. m.				74	64	SW., 5	Cloudy.
Do	20	9 a. m.				62	60	Calm	Cloudy; rain, thunder, and chain lightning.
Do	20	3 p. m.				76	64	SE., 1	Cloudy.
Do	21	9 a. m.				62	59	Calm	Rain, thunder, and lightning.
Do	21	3 p. m.				69	62	SE., 6	Squally and gloomy.
Do	22	9 a. m.				60	59	Calm	Rain, thunder, and lightning.
Do	22	3 p. m.				66	60	SE., 6	Cloudy, with thunder.
Do	23	9 a. m.				63	60	Calm	Cloudy.
Do	23	3 p. m.				68	63	SE., 3	Rain and thunder.
Do	24	9 a. m.				60	60	SE., 1	Cloudy.
Do	24	3 p. m.				68	63	SW., 2	Cloudy.
Do	25	9 a. m.				60	57	Calm	Cloudy.
Do	25	3 p. m.				74	62	SW., 1	Cloudy.
Do	26	9 a. m.				62	59	Calm	Cloudy.

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METEOROLOGICAL OBSERVATIONS—Continued.

Locality.	Date.	Hour.	Barometer.	Fah. Therm.	Boiling point.	Fah. Therm.	Wet bulb.	Wind—force.	Remarks.
	1852.			°		°	°		
Cochabamba	Feb. 26	3 p. m.				74	64	SW., 1	Cloudy.
Do	27	9 a. m.				61	60	NE., 1	Rain and thunder on the mountains.
Do	27	3 p. m.				65	61	NE., 1	Cloudy.
Do	28	9 a. m.				61	59	SE., 1	Rain.
Do	28	3 p. m.				72	63	NE., 1	Cloudy; rain on the mountains to the northwest.
Do	29	9 a. m.				63	61	SE., 2	Cloudy.
Do	29	3 p. m.				76	66	SW., 3	Cloudy.
Do	Mar. 1	9 a. m.				64	63	Calm	Rain, lightning, and thunder.
Do	1	3 p. m.				77	67	SW., 2	Cloudy.
Do	2	9 a. m.				62	62	Calm	Rain, thunder, and lightning.
Do	2	3 p. m.				70	63	NW., 2	Cloudy.
Do	3	9 a. m.				56	56	Calm	Rain, thunder, and lightning.
Do	3	3 p. m.				66	62	NW., 1	Cloudy; lightning.
Do	4	9 a. m.				62	60	SE., 1	Cloudy at 8.45; slight shock of an earthquake.
Do	4	3 p. m.				74	64	SE., 1	Cloudy.
Do	5	9 a. m.				63	62	SE., 1	Cloudy; lightning and thunder—passing showers.
Do	5	3 p. m.				74	65	SW., 2	Cloudy; thunder.
Do	6	9 a. m.				62	59	Calm	Cloudy.
Do	6	3 p. m.				76	63	NE., 1	Cloudy at 7 p. m.; bright meteor in the north.
Do	7	9 a. m.				66	60	NE., 1	Cloudy.
Do	7	3 p. m.				76	63	Calm	Cloudy; heavy gale from southeast during the night, accompanied with thunder and lightning.
Do	8	9 a. m.				65	60	SE., 1	Cloudy.
Do	8	3 p. m.				80	64	W., 2	Cloudy.
Do	9	9 a. m.				66	64	NE., 1	Foggy; during the night a heavy gale of wind from southeast, but no rain.
Do	9	3 p. m.				80	68	NW., 1	Cloudy.
Do	10	9 a. m.				66	61	Calm	Cloudy; snowing on the mountains.
Do	10	3 p. m.				74	64	SW., 2	Cloudy.
Do	11	9 a. m.				62	59	NE	Cloudy and lightning.
Do	11	3 p. m.				76	64	NE., 3	Cloudy.
Do	12	9 a. m.				65	60	Calm	Cloudy; slight shower of rain from northwest.
Do	12	3 p. m.				67	66	Calm	Cloudy.
Do	13	9 a. m.				58	62	SE., 2	Cloudy; rain and thunder.
Do	13	3 p. m.				75	64	SW., 1	Cloudy.
Do	14	9 a. m.				60	61	Calm	Lightning, with light rain showers.
Do	14	3 p. m.				72	63	SW., 2	Cloudy.
Do	15	9 a. m.				63	59	NE., 1	Cloudy, with rain storm on the mountains.
Do	15	3 p. m.				72	66	SE., 3	Thunder and lightning.
Do	16	9 a. m.				66	61	Calm	Thunder and lightning.
Do	16	3 p. m.				72	64	NE., 2	Cloudy, with thunder.
Do	17	9 a. m.				65	62	SE., 2	Thunder—passing showers.
Do	17	3 p. m.				74	66	NW, 1	Lightning, thunder, and passing showers.
Do	18	9 a. m.				65	62	SW., 1	Cloudy; lightning and thunder.
Do	18	3 p. m.				76	66	NE., 2	Cloudy, with thunder.
Do	19	9 a. m.				60	56	NE., 1	Rain, thunder, and lightning.
Do	19	3 p. m.				64	60	SW., 1	Cloudy; heavy rain during the night.
Do	20	9 a. m.				54	56	NE., 1	Rain.
Do	20	3 p. m.				60	58	Calm	Overcast.
Do	21	9 a. m.				56	58	Calm	Cloudy; rain during the night.
Do	21	3 p. m.				62	58	Calm	Cloudy; much snow on the mountains.
Do	22	9 a. m.				56	54	NE., 1	Overcast.
Do	22	3 p. m.				58	56	SE., 3	Rain and thunder during the whole night.
Do	23	9 a. m.				50	50	SE., 1	Rain and gloomy.
Do	23	3 p. m.				60	55	SW., 1	Cloudy.
Do	24	9 a. m.				60	57	SE., 1	Cloudy.
Do	24	3 p. m.				68	59	Calm	Cloudy.
Do	25	11 a. m.				64	62	SE., 3	Cloudy; rain and snow storms on the mountains.
Do	25	3 p. m.				66	60	SE., 6	Cloudy.
Do	26	9 a. m.				60	58	SE., 1	Cloudy, with passing showers—small drops.
Do	26	3 p. m.				64	60	NE., 1	Rain.
Do	27	9 a. m.				62	60	NE., 1	Cloudy.
Do	27	3 p. m.				66	61	Calm	Rain.
Do	28	9 a. m.				55	57	SE., 2	Rain and gloomy.
Do	28	3 p. m.				66	60	Calm	Rain.
Do	29	9 a. m.				63	62	Calm	Cloudy, with lightning and rain.
Do	29	3 p. m.				57	58	Calm	Foggy, rain and thunder.
Do	30	9 a. m.				59	57	Calm	Cloudy.
Do	30	3 p. m.				72	62	Calm	Cloudy.
Do	31	9 a. m.				60	59	SE., 1	Cloudy round the mountain tops.
Do	31	3 p. m.				70	62	Calm	Cloudy, with thunder.
Do	April 1	9 a. m.				54	54	NW., 3	Rain; a heavy fall of snow on the mountains to the NW.; snow line a third below the summit.
Do	1	3 p. m.				68	60	SW., 1	Cloudy.
Do	2	9 a. m.				58	58	SW., 1	Cloudy round the mountain tops; blue sky over the city.

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METEOROLOGICAL OBSERVATIONS—Continued.

Locality.	Date.	Hour.	Barometer.	Fah. Therm.	Boiling point.	Fah. Therm.	Wet bulb.	Wind—force.	Remarks.
	1852.			°		°	°		
Cochabamba	April 2	3 p. m				73	60	SW., 1	Cloudy round the mountain tops, and clear in the valley.
Do	3	9 a. m				58	56	Calm	Blue sky, with misty atmosphere.
Do	3	3 p. m				76	61	SW., 1	Blue sky, with hazy atmosphere.
Do	4	9 a. m				62	60	Calm	Blue sky, with hazy atmosphere.
Do	4	3 p. m				77	67	SW., 1	Cloudy.
Do	5	9 a. m				62	56	SE., 1	Rain, lightning, and thunder.
Do	5	3 p. m				78	64	NW., 1	Cloudy.
Do	6	9 a. m				62	60	SW., 1	Lightning, thunder, and wet dew.
Do	6	3 p. m				76	66	NE., 1	Misty.
Do	7	9 a. m				62	61	Calm	Wet dew during the night; gale of wind, with rain, thunder, and lightning.
Do	7	3 p. m				72	68	NE., 1	Cloudy.
Do	8	9 a. m				60	60	Calm	Rain, lightning, and thunder.
Do	8	3 p. m				78	64	SW., 2	Cloudy.
Do	9	9 a. m				60	59	NE., 1	Blue sky during the day, and wet dew at night.
Do	9	3 p. m				80	66	SW., 1	Cloudy.
Do	10	9 a. m				61	60	Calm	Cloudy, with hail storm—stones as large as peas.
Do	10	3 p. m				68	62	SE., 4	Rain, lightning, and thunder.
Do	11	9 a. m				58	56	SE., 1	Wet dew.
Do	11	3 p. m				79	67	NE., 1	Lightning and thunder.
Do	12	9 a. m				61	62	NE., 1	Cloudy.
Do	12	3 p. m				72	62	NE., 1	Cloudy.
Do	13	9 a. m				60	58	NE., 1	Lightning; wet dew.
Do	13	3 p. m				78	61	SW., 1	Cloudy, with thunder.
Do	14	9 a. m				62	58	NE., 1	Wet dew, and lightning.
Do	14	3 p. m				80	63	Calm	Cloudy, with thunder.
Do	15	9 a. m				62	60	SW., 2	Wet dew and lightning; very little snow on the mountains.
Do	15	3 p. m				80	64	SW., 3	Cloudy; lightning towards the NE.
Do	16	9 a. m				62	58	NE., 1	Wet dew and lightning.
Do	16	3 p. m				80	62	Calm	Cloudy.
Do	17	9 a. m				62	60	NE., 1	Blue sky, not a cloud to be seen.
Do	17	4 p. m				82	64	SW., 1	Cloudy.
Do	18	9 a. m				62	61	SW., 2	Cloudy; rain.
Do	18	3 p. m				62	78	NW., 3	Cloudy.
Do	19	9 a. m				62	60	SW., 1	Cloudy.
Do	19	3 p. m				74	60	SW., 1	Cloudy.
Do	20	9 a. m				64	62	SW., 2	Cloudy; slight showers; lightning and thunder.
Do	20	4 p. m				76	61	NW., 1	Passing clouds.
Do	21	9 a. m				62	61	SW., 1	Blue sky and wet dew.
Do	21	4 p. m				84	61	NW., 1	Cloudy.
Do	22	9 a. m				63	59	SW., 1	Cloudy; heavy dew during the night.
Do	22	3 p. m				78	61	SW., 2	Cloudy; lightning.
Do	23	9 a. m				64	62	SW., 1	Cloudy, with lightning.
Do	23	3 p. m				72	66	NE., 1	Cloudy, with thunder; no dew during the night.
Do	24	9 a. m				63	61	Calm	Cloudy, with lightning.
Do	24	3 p. m				74	62	SE., 2	Rain and thunder.
Do	25	9 a. m				62	58	SW., 3	Wet dew and lightning.
Do	25	3 p. m				74	60	SE., 2	Cloudy, with thunder.
Do	26	9 a. m				60	59	SE., 1	Cloudy, with lightning.
Do	26	3 p. m				70	62	SE., 1	Cloudy, with thunder.
Do	27	9 a. m				58	56	Calm	Wet dew, with lightning.
Do	27	4 p. m				76	58	Calm	Cloudy, with thunder.
Lake Uara-Uara	28	10.30 a. m			187.800	54			
Cochabamba	28	4 p. m				72	62	SE., 1	Cloudy and misty.
Do	29	9 a. m				62	60	SE., 1	Wet dew; cloudy, with lightning.
Do	29	3 p. m				70	60	Calm	Cloudy.
Do	30	9 a. m				63	60	Calm	Cloudy.
Do	30	3 p. m				76	64	SW., 2	Cloudy.
Hacienda Colomi	May 13	5.30 p. m			191.500	55	53	NE., 6	Cold, frosty weather.
Peach Orchard	14	5.30 p. m			197.000	58	57	Calm	Cloudy; heavy dew falls at night.
Llactahuasi	15	4 p. m			201.500	70	71	Calm	Cloudy.
On the road down the eastern side of the Andes	16	5 p. m			201.750	72	66	Calm	
Indian hut, near Espiritu Santo Creek	17	5 p. m			205.750	70	65	Light airs	Foggy.
Espiritu Santo	18	3 p. m			206.500	73	71	Light airs	Cloudy.
Do	19	9 a. m				68	65	Calm	Clear.
In the woods, near Paracti river	20	5 p. m			208.250	74	74	Calm	Cloudy.
St. Antonio	21	5 p. m			208.500	74	75	Calm	Cloudy; temperature of river water, 70°.
Chaparé river	27	9.30 a. m			209.500	75	74	Variable	Temperature of river water, 74°.

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METEOROLOGICAL OBSERVATIONS—Continued.

Locality.	Date.	Hour.	Barometer.	Fah. Therm.	Boiling point.	Fah. Therm.	Wet bulb.	Wind—force.	Remarks.
	1852.			°		°	°		
Chaparé river	May 28	9.30 a. m.			209.600	76	74		Temperature of river water, 71°.
Do	29	9.30 a. m.			209.750	82	74	N	Cloudy; temperature of river water, 73°.
Mamoré river	30	9 a. m.			209.750	73	70	E	Rain; temperature of river water, 75°.
Do	30	3 p. m.				76	73	Calm	Cloudy; rain and rainbow to the eastward.
Do	31	9 a. m.				74	69	E	Temperature of river water, 76°.
Do	31	3 p. m.				80	74	E	Cumulus.
Trinidad de Mojos	June 2	9 a. m.				84		NE., light	Clear.
Do	2	3 p. m.				87		NE., light	Cumulus, 5.
Do	3	9 a. m.				84		NE., light	Cumulus, 2.
Do	3	3 p. m.				88		NE., light	Cumulus, 7.
Do	4	9 a. m.				83		NE., fresh	Cumulus strata, 9.
Do	4	3 p. m.				89		NW., fresh	Cumulus strata, 4; cloudy night.
Do	5	9 a. m.				83		NW., fresh	Cumulus strata, 4.
Do	5	2 p. m.				83		NW	Rain.
Do	5	3 p. m.				86		NW	Cumulus, 9; first part of the night clear.
Do	6	9 a. m.				82		NW., fresh	
Do	6	3 p. m.				90		NW	Cloudy; first part of the night clear.
Do	7	9 a. m.				82		NW., fresh	Cloudy.
Do	7	3 p. m.				84			
Do	7	3.30 p. m.				77		SE	Rain and thunder.
Do	9							S	First part of the day clear and calm; latter part cool.
Do	10	9 a. m.			209.850	74		S	Cumulus clouds.
Do	12	3 p. m.				81		N	Clear.
Do	13	9 a. m.				91		Calm	Clear.
Do	13	1 p. m.							Shower from southeast.
Do	13	3 p. m.				88		SE	Misty atmosphere.
Do	14	9 a. m.				81		SE., light	Cumulus clouds; night clear and pleasant.
Do	15	9 a. m.				84		NE., light	Clear blue sky.
Do	15	11 a. m.						NW., fresh	
Do	15	3 p. m.				89		NW., fresh	Cumulus, 4.
Do	16	9 a. m.				80		SE	At daylight a thick fog.
Do	16	3 p. m.				85		SE., fresh	Hazy atmosphere.
Do	17	9 a. m.				71		S	
Do	17	3 p. m.				85		S., light	Night clear and cool.
Do	18	9 a. m.				73		S	Overcast.
Do	18	3 p. m.				86		S	Clear.
Do	19	9 a. m.				71		SE., light	At daylight foggy.
Do	19	3 p. m.				82		SE	
Do	20	9 a. m.				69		SE	Overcast.
Do	20	3 p. m.				70		SE	
Do	21	9 a. m.				66		SE	Overcast.
Do	21	3 p. m.				78		SE	
Do	22	9 a. m.				67		Calm	Misty.
Do	22	12 m.						NW	
Do	22	3 p. m.				86		NW., fresh	
Do	23	9 a. m.				73		SE., fresh	Hazy.
Do	23	3 p. m.				79		SE., fresh	First part of the night calm and clear.
Do	24	9 a. m.				76		SE	Clear.
Do	24	3 p. m.				88		SE., light	
Do	25	9 a. m.				82		SE., light	Clear.
Do	25	3 p. m.				87			
Do	26	9 a. m.				76		NW., light	
Do	26	3 p. m.				82		NW., light	Hazy.
Do	27	9 a. m.				75		N., light	Cloudy.
Do	27	3 p. m.				82		NE., light	Clear.
Do	28	9 a. m.				76		SE., light	Clear.
Do	28	3 p. m.				81		SE., light	Clear.
Do	29	9 a. m.				76		SE., light	Clear.
Do	29	3 p. m.				82		NE., fresh	Hazy atmosphere.
Do	30	9 a. m.				80		NE., light	Hazy.
Do	30	3 p. m.				81		Calm	
Do	July 1	9 a. m.				76		SE., light	Cloudy.
Do	1	3 p. m.				84		NW., fresh	Hazy atmosphere.
Do	2	9 a. m.				76		NW	Hazy.
Do	2	3 p. m.				82		NW	Hazy.
Do	3	9 a. m.				77		NW., fresh	Clear.
Do	3	3 p. m.				85		NW., fresh	Clear.
Do	4	9 a. m.				76		NE., fresh	Cumulus clouds.
Do	4	3 p. m.				85		NE., fresh	Cloudy.
Do	5	9 a. m.				77		NW., fresh	
Do	5	3 p. m.				88		NW., fresh	Cloudy.
Do	6	9 a. m.				80		NW., fresh	
Do	6	3 p. m.				74		SE	Cloudy.
Do	7	9 a. m.				62		SW	Cloudy.
Do	7	3 p. m.				64		SW	Overcast.
Do	8	9 a. m.				66		Calm	Cloudy.
Do	8	3 p. m.				72		SW	

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METEOROLOGICAL OBSERVATIONS—Continued.

Locality.	Date.	Hour.	Barometer.	Fah. Therm.	Boiling point.	Fah. Therm.	Wet bulb.	Wind—force.	Temp. of river water.	Remarks.
	1852.			°		°	°		°	
Trinidad de Mojos	July 9	9 a. m.				65		SW., light		Cloudy.
Do	9	3 p. m.				68		SW.		Cloudy.
Do	10	9 a. m.				64		SE.		Cloudy.
Do	10	3 p. m.				67		SE., fresh		Clear.
Do	11	9 a. m.				62		SE.		
Do	11	3 p. m.				67		SE.		
Do	12	9 a. m.				63		SE.		Pleasant.
Do	12	3 p. m.				73		SE.		Hazy.
Do	13	9 a. m.				67		SE.		Clear.
Do	13	3 p. m.				76		NW.		Heavy dew during the night.
Do	14	9 a. m.				72		NE.		
Do	14	3 p. m.				82		NW.		Hazy.
Do	15	9 a. m.				73		NW.		Clear.
Do	15	3 p. m.				84		Calm		Clear.
Do	16	9 a. m.				87		NW.		Cumulus clouds.
Do	16	3 p. m.				81		NW.		Clear.
Do	17	9 a. m.				74		NW.		Clear.
Do	17	3 p. m.				84		NW.		Hazy.
Do	18	9 a. m.				78		NW.		Clear.
Do	18	3 p. m.				86		NW., fresh		Hazy atmosphere.
Do	19	9 a. m.				72		SE., fresh		Hazy.
Do	19	3 p. m.				78		SE.		Hazy.
Do	20	9 a. m.				72		Calm		
Do	20	3 p. m.				85		NW.		
Do	21	9 a. m.				79		NW.		Cloudy.
Do	21	3 p. m.				84		NW.		Clear.
Do	22	9 a. m.				79		NW.		
Do	22	3 p. m.				86		NW.		
Do	23	9 a. m.				69		SE.		Hazy.
Do	23	3 p. m.				77		SE., fresh		Hazy.
Do	24	9 a. m.				66		SE., fresh		Clear.
Do	24	3 p. m.				70		SE.		
Do	25	9 a. m.				66		SE., fresh		Clear.

Do	25	3 p. m.				76		SE.		Hazy.
Do	26	9 a. m.				67		NW.		Clear.
Do	26	3 p. m.				82		NW.		Cloudy.
Do	27	9 a. m.				74		SE.		Clear.
Do	27	3 p. m.				83		NE.		
Do	28	9 a. m.				72		SE., fresh		Cloudy.
Do	28	3 p. m.				76		SE., fresh		Hazy.
Do	29	9 a. m.				70		SE.		Cloudy.
Do	29	3 p. m.				78		SE.		Hazy.
Do	30	9 a. m.				74		SE.		Clear.
Do	30	3 p. m.				84		NW.		Clear.
Do	31	9 a. m.				79		SW.		Hazy.
Do	31	3 p. m.				86		NW.		
Do	Aug. 1	9 a. m.				79		Calm		
Do	1	3 p. m.				88		Calm		Hazy.
Do	2	9 a. m.				80		NW		Clear.
Do	2	3 p. m.				90		NW		
Do	3	9 a. m.				80		W		Clear.
Do	3	3 p. m.				89		NW		Hazy atmosphere.
Do	4	9 a. m.				82		NW., fresh		Clear sky.
Do	4	3 p. m.				88		NW., fresh		Clear sky.
Do	5	9 a. m.				73		SE.		Hazy.
Do	5	3 p. m.				81		SE.		
Do	6	9 a. m.				73		SE.		Hazy.
Do	6	3 p. m.				82		SE., fresh		
Do	7	9 a. m.				75		SE.		Hazy atmosphere.
Do	7	3 p. m.				87		NE.		Hazy.
Do	8	9 a. m.				80		SE., fresh		Clear sky.
Do	8	3 p. m.				85		SE.		Heavy dew during the night.
Do	9	9 a. m.				75		SE., fresh		Clear.
Do	9	4 p. m.				84		SE.		Clear.
Do	10	9 a. m.				76		SE.		Hazy.
Do	10	3 p. m.				84		SE.		
Do	11	9 a. m.				74		SE., fresh		Hazy atmosphere.
Do	11	3 p. m.				81		SE, fresh		
Do	12	9 a. m.				73		SE., fresh		Hazy atmosphere.
Do	12	3 p. m.				82		SE.		Hazy atmosphere.
Do	13	9 a. m.				74		SW.		Clear.
Do	13	3 p. m.				85		NW.		Cloudy.
Mouth of the Yvaré river	18	6 a. m.			210.120	74		Calm	76	
Manoré river	19	9 a. m.				80		SE.	78	Thunder, and light shower of rain.
Do	19	3 p. m.				88		NW	78	
Do	20	9 a. m.				82		NW	78	Lightning to the southeast.
Do	20	3 p. m.				91		N.	79	Thunder to the south.
Do	21	9 a. m.			210.250	89		N.	79	

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METEOROLOGICAL OBSERVATIONS—Continued.

Locality.	Date.	Hour.	Barometer.	Fah. Therm.	Boiling point.	Fah. Therm.	Wet bulb.	Wind—force.	Temp. of river water.	Remarks.
	1852.			°		°	°		°	
Mamoré river	Aug. 22	9 a. m.				77		SE	78	Heavy showers of rain.
Do	22	4 p. m.				69		SE.	74	Gale of wind.
Do	23	9 a. m.				62		SE	74	Heavy "pampero;" rain and lightning.
Do	23	3 p. m.				61		SE	73	Cloudy; rain during the night.
Do	24	9 a. m.			210.250	64		SE	72	
Exaltacion	25	3 p. m.				93		SW	78	Clear.
Do	26	9 a. m.				78		SE., light	76	Clear.
Mamoré river	Sept. 1	9 a. m.				88		S., light	79	Clear.
Do	1	4 p. m.				88		Calm	79	Thunder to the north.
Do	2	9 a. m.				78		SE	78	Rain, thunder, and lightning.
Do	2	3 p. m.				73		SE	77	Cloudy.
Do	3	8 a. m.			210.250	72		E	78	Cloudy.
Do	4	9 a. m.				78		SE., light	77	Cloudy.
Do	4	3 p. m.				80		N	78	Lightning in the north.
Itenez river	5	9 a. m.				80		N	81	Heavy dew during the night.
Do	5	3 p. m.				86		Calm	81	
Do	6	8.30 a. m.			210.370	85		Calm	81	Clear.
Do	6	3 p. m.				89		NW	88	
Do	7	9 a. m.				82		NW	82	Clear.
BRAZIL.										
Forte do Principe da Beira	8	3 p. m.				89		SE., fresh		Cloudy.
Do do	9	9 a. m.				64		SE., fresh		Cloudy.
Do do	9	3 p. m.				64		SE		Cloudy.
Do do	10	9 a. m.				68		SE., fresh.		Rain during the morning.
Do do	10	3 p. m.				76		SE., light		Cloudy.
Do do	11	9 a. m.				73		SE., light		Clear.
Do do	11	3 p. m.				84				
Do do	12	9 a. m.				78		SE., light		
Do do	12	2 p. m.			210.120	91		N., light		
Do do	12	3 p. m.				92		NE		
Do do	13	9 a. m.				84		N., fresh		Clear.
Mamoré river	17	9 a. m.			210.370	78		SE	79	Clear.
Do	17	3 p. m.				87		SE	80	
Do	19	9 a. m.				82		Calm	81	Cloudy.
Do	19	3 p. m.				87		N., fresh	80	Thunder-gust passed to south of the party.
Guajará-assú falls—foot	20	3 p. m.			210.500	83		NE	81	Heavy rain and thunder-gust passed over head.
Do	21	3 p. m.				85		S	81	
Foot of Pau-Grande rapids	22	9 a. m.			210.500	81		N	81	
Mouth of Mamoré river									83	
Mouth of Beni river									82	
Madeira river—foot of Madeira falls	22	4 p. m.				91		Calm	82	Heavy dew at night.
Ribeirao falls	24	1 p. m.						N		Rain and thunder.
Do	24	3 p. m.				86		Calm	83	Cloudy.
Do	25	9 a. m.				84		N	82	Cloudy.
Do	25	2 p. m.						N		Thunder to the northeast. Passed Abuna creek.
Do	25	3.30 p. m.				86		North'ly airs.	82	Cloudy.
Foot of Pedreneira falls	26	9 a. m.			210.750	82		NE. airs	82	Clear.
Trez Irmaos rapids	27	3 p. m.				85		Calm	84	Cloudy.
Foot of Girau falls	28	3 p. m.				99		NE	86	Cloudy.
Below Caldeirão do Inferno	29	9 a. m.				85		Calm	84	Clear.
Salto do Teotoni falls	30	3 p. m.				87		SW., strong	85	Cloudy.
Madeira river, below all the falls	Oct. 2	3 p. m.				86			84	
Tamandua island	3	9 a. m.			210.870	82		NE., fresh		Big drogs of heavy rain; sharp lightning and thunder.
Do	4	9 a. m.				88		NE., light	87	Cloudy; temperature of a green water stream entering on the east side, 87°.
Do	4	3 p. m.				86		NE	84	Cloudy.
Crato	7	3 p. m.				92		Calm	86	Cloudy.
Do	8	9 a. m.				83		Calm	85	Cloudy.
Do	8	3 p. m.				88		NE	86	Cloudy.
Do	9	9 a. m.				85		NE	86	Cloudy.
Do	10	9 a. m.				84		NE	86	Cloudy.
Do	10	3 p. m.				90		NE	86	
Do	11	3 p. m.				89		NE	86	Thunder to the northeast.
Do	12	9 a. m.				83		NE	86	Cloudy.
Do	12	3 p. m.				89		NE	87	Cloudy.
Madeira river	13	7.30 a. m.			210.870	83		Calm	86	Clear.
Do	13	3 p. m.				96		Calm	86	Cloudy.
Do	14	3 p. m.				95		NE., light	88	Clear.
Do	19	9 a. m.				88		N., light	87	Clear.
Do	19	3 p. m.				86		NE	88	Heavy gust of wind thunder to northeast.
Mouth of Madeira river	20	9 a. m.				86		NE., fresh	88	Heavy dew during the night.

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Table of distances in South Peru, by government measurement.

	Leagues.
From *Cuzco** to Isco-chaca	4
Surite	3
Lima-Tambo	6
Mollepata	4
La Banca	4
Curahuasi	5
Abancay	6
Carhuacahua	5
Huancarama	3
Pincos	4
Argama	3
Andahuailas	3
Moyobamba	4
Uripa	6
Bombon	3
Ocros	9
Matará	3
Pucuvilca	5
Ayacucho	4
	84
Huanta	6
Marcas	6
Parcos	6
Paucará	4
Huancavelica	10
	116
Cotay	10
Turpo	6
Viñac	8
Lunahuana	13
Asia	15
Chilca	8
Lurin	7
Lima	6
	189
Oropesa	4
San Rogue	3
Quiquijana	5
Checcacupe	5
Cacha	4
Sicuani	3
Agua Caliente	5
Santa Rosa	8
Ayavire	8
Pucará	6
Lampa	9
Juliaca	7
Caracoto	2
Paucarcolla	5
Puno	3
	77

	Leagues.
From *Puno* to Chucuito	4
Acora	3
Ylave	5
Juli	5
Pomata	4
Tambillo	3
Zepita	4
Desaguedere	2
	30
From *Cuzco* to Oropesa	4
San Rogue	3
Quiquijana	5
Checcapue	5
Cacha	4
Sicuani	3
Langui	5
Laurayani	6
Huichuma	6
Ocoruro	9
Rinconada	3
Rumihuasi	7
Ayavirine	5
Colca	4
Huallata	8
Apo	6
Cangallo	7
Arequipa	5
	95
From *Arequipa* to Tambo	24
Morro	10
Puquina	14
Moquegua	2
Sitana	12
Sama	9
Tacna	9
Arica	12
Chaca	10
Camarones	9
Chesa	7
Aroma	21
Trapacá	6
	145
From *Puno* to Paucarcolla	3
Caracoto	5
Lampa	9
Azángaro	15
Crucero—capital of Carabaya	16
	48

* Capitals of Departments in *italics*.

Distances between Capitals of Departments in Bolivia, by government measurement.

	Leagues.
From Sucre to Potosi	29
Tarija	96
Cobija	187
Oruro	74
La Paz	123
Cochabamba	65
Santa Cruz	127
Trinidad, by Cochabamba	265
From Potosi to Tarija	80
Cobija	158
Oruro	63
La Paz	112
Cochabamba	80
Santa Cruz	156
Trinidad	280
From Tarija to Cobija	150
Oruro	43
La Paz	192
Cochabamba	160
Santa Cruz	210
Trinidad	360
From Cobija to Oruro	183
La Paz	232
Cochabamba	219
Santa Cruz, by Potosi and Cochabamba	345
Trinidad, by Potosi, Cochabamba, and Santa Cruz	535
From Oruro to La Paz	49
Cochabamba	36
Santa Cruz	143
Trinidad	236
From La Paz to Cochabamba	80
Santa Cruz	187
Trinidad, by Apolobamba	250
From Cochabamba to Santa Cruz	107
Trinidad	200
From Santa Cruz to Trinidad	190

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